ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

Additional Updates for the Accelerated PharmD Program:

- **Academic Standards & Policies – Doctor of Pharmacy section**
  - **GPA requirements (changes in red)**

Updated for Spring 2019 Semester/Changes made to:

- **Academic Standards & Policies – Doctor of Pharmacy section**
- **Course Descriptions**
- **Doctor of Pharmacy Required Courses**
- **Early Assurance/Pre-Pharmacy**

2018-19 College Catalog

GENERAL INFORMATION

Founded in 1881, Albany College of Pharmacy and Health Sciences is a private, independent institution with a long tradition of academic and research excellence.

The College is committed to educating the next generation of leaders in the health care professions and advancing innovative research that translates scientific discoveries into therapies that benefit humankind.

In addition to its Doctor of Pharmacy program, ACPHS offers six Bachelor's programs and five graduate programs in the health sciences.

The College's main campus is located in Albany, New York; its satellite campus is in Colchester, Vermont.

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

Welcome!

Albany College of Pharmacy and Health Sciences (ACPHS) is committed to graduating the best health care minds in the world, with an array of degree programs designed to help students succeed in pharmacy and other health related fields.

There are approximately 1,400 students enrolled at the College and more than 150 full- and part-time faculty. The College has campuses in Albany, New York, and Colchester, Vermont. Our Vermont Campus is home to the only pharmacy program in the state.

According to the 2016 College Scorecard, the median salary of ACPHS students ten years after entering school is $118,800, the third highest figure among the 4,053 schools that make up the College Scorecard database.

The ACPHS experience is one that combines quality academics, experiential learning, personalized attention, and a strong emphasis on service – all of which help our students grow personally and develop into talented and trusted professionals.

ACPHS has long been regarded for its Doctor of Pharmacy program which remains the school's core program. In recent years, the College has expanded its academic offerings to include five bachelor's programs and five master's programs in the health sciences.

Opportunities exist for students within each of these programs to work side-by-side with faculty on groundbreaking research in areas such as cancer, infectious disease, and obesity.

These opportunities, along with access to resources such as the cutting edge Pharmaceutical Research Institute, are part of what distinguishes ACPHS from other colleges and universities.

The academic experience at the College is complemented by numerous community service initiatives, including a student-led Community Health Day in Albany and Wellness Fair in Colchester.

Graduates of the College are prepared for a range of careers such as: biochemist, clinical laboratory scientist, consumer safety officer, drug information specialist, environmental toxicologist, health policy analyst, hospital administrator, pharmacist, physician, physician assistant and research scientist.

Graduates are also well positioned to continue their education in graduate or professional schools.

DISCLAIMER

All information in this Catalog pertains to the 2018-2019 academic year and is correct to the extent that the information was available (by August 2018).

However, Albany College of Pharmacy and Health Sciences reserves the right to change the course offerings, tuition, fees, rules governing admission, requirements for graduation and the granting of degrees, and any other regulations affecting its students. Such changes will take effect as determined by the College, whether or not there is actual notice to individual students, prospective students or their parents.

The College also reserves the right to revise this Catalog at any time without notice, either by direct amendment or by promulgation of a policy or procedure that modifies or abrogates any provision in the Catalog.

Board of Trustees

MARION MORTON, '84, CHAIR
Ms. Morton, R.Ph., M.B.A., is Global Category Head of Obesity Care at Nestlé Health Science. She has 25 years of experience in the pharmaceutical industry in marketing, sales, managed care, and customer relations. Prior to joining Nestlé , she was Vice President of Cardiovascular Marketing at Boehringer-Ingelheim. She also has served as Vice President of the Transplant Business Franchise for Novartis and worked in the Worldwide Medicines Group for Bristol-Myers Squibb.

MATTHEW BETTE, VICE CHAIR
Mr. Bette is Principal and co-founder of Bette and Cring, a diversified construction management, design-build, and general contracting firm. He has more than 30 years of experience in the construction industry and has been responsible for the successful delivery of over one billion dollars of construction projects. Along with his brother Peter, he helps lead the overall operations of the company.

WALTER S. BORISENOK, TREASURER
Mr. Borisenok co-founded Fortitech, Inc., in 1986 and served as its President until the sale of the company in November 2012. Fortitech's custom additives blend vitamins, minerals, and other nutrients to help boost the energy and nutritional content of a wide range of food and beverage products. At the time of its sale, Fortitech had 500 employees and operations in nine countries.

Board of Trustees

KANDYCE J. DALEY, '74, SECRETARY
Mrs. Daley, R.Ph., M.B.A., is a pharmacist with Kinney Drugs in the Health Direct Division. Prior to her current position, she was Pharmacy Services Manager for the New York Group of Eckerd Corporation where she was responsible for the pharmacy operations of 449 stores in New York State, northern New Jersey, and Connecticut. She served as Chair of the ACPHS Board of Trustees from 2003 to 2009.

RAYMOND BLESER JR., '81
Mr. Bleser is Owner and President of Northeastern Fine Jewelry, formally founded in 1986 and now with three locations. It is the largest independently-owned jeweler in the Capital Region of New York State and is a member of The Leading Jewelers in the World group. Ray also serves as secretary of the Board of Directors of Proctor's Theatre in Schenectady, NY, and is a past member of the St. Claire's Hospital Board of Directors.

LEIGH BRISCOE-DWYER, ’87
Ms. Briscoe-Dwyer, R.Ph., Pharm.D., BCPS, is the Vice President of Clinical Affairs at PharMEDium. Her previous positions include Chief Pharmacy and Medication Safety Officer at North Shore LIJ Health System, Director of Pharmaceutical Care Services for Bassett Healthcare, and Clinical Education Consultant for Pfizer. She is a Past President of the New York State Council of Health-system Pharmacists and a member of the New York State Board of Pharmacy.

Board of Trustees

Richard H. Daffner, '63
Richard H. Daffner, M.D., F.A.C.R., practiced radiology with Allegheny Radiology Associates and Allegheny General Hospital in Pittsburgh, Pennsylvania, for 30 years. He also taught at several colleges and universities including Temple University School of Medicine and Duke University Medical Center. His list of scholarly accomplishments includes serving as author on 8 textbooks, 27 book chapters, and 169 journal articles.

JAMES E. DERING
James E. Dering, J.D., is a partner at Garfunkel Wild, P.C., a law firm specializing in the business and legal needs of clients in the health care industry. He previously served as General Counsel of the New York State Department of Health for nearly five years, where he was the chief legal advisor to the Commissioner of Health and oversaw approximately 125 attorneys and staff.

PAUL DEROHANNESIAN II
Paul DerOhannesian II, J.D., is a civil and criminal litigation attorney at the firm DerOhannesian and DerOhannesian in Albany, NY. Prior to joining the firm, Mr. DerOhannesian was an assistant district attorney with the Albany County District Attorney's Office and for 22 years headed the D.A.'s Special Assault Unit. He is the author of a definitive two-volume text, Sexual Assault Trials, Fourth Edition.

Board of Trustees

CHRIS DI LASCIA, ’83
Chris Di Lascia, Pharm.D., is the President, CEO, and co-founder of Transition Patient Services (TPS). He was previously employed with Aventis Pharmaceuticals where he held the position of Global Marketing Director for Lovenox. He began his pharmaceutical industry career as a Hospital Sales Representative with Eli Lilly and Company before leaving to join Schering-Plough as a Managed Care and Government Affairs Manager.

MICHAEL DUTEAU, ’92
Mr. Duteau, R.Ph., is Vice President of Business Development and Strategic Relations at Kinney Drugs. Prior to joining Kinney in 2006, he was District Pharmacy Supervisor for Eckerd Corporation where he managed 80 pharmacies in Central and Eastern New York State. He is the current president of the New York State Chain Pharmacy Association and a past Chairman (2012-13) of the New York State Board of Pharmacy.

ROCCO GIRUZZI, '58
Mr. Giruzzi, R.Ph., is retired owner of two independent pharmacies - Fort Schuyler Pharmacy (1962-78) and South Utica Pharmacy (1976 to 1990). He is Past President and Chair of the Pharmacists Society of the State of New York (PSSNY) and a board member of the New York State Board of Pharmacy. Mr. Giruzzi is serving his fourth three-year term as a trustee of the College.

Board of Trustees

David R. Harris
David R. Harris, Ph.D., became the 19th president of Union College on July 1, 2018. Before joining Union, he was the provost and senior vice president at Tufts University, and prior to that experience he served in multiple roles at Cornell University, including senior associate dean of the College of Arts and Sciences. In 2010, he served as deputy assistant secretary in the U.S. Department of Health and Human Services.

SUSAN LEARNED, '91
Susan Learned, Pharm.D., M.D., Ph.D., is the Senior Vice President of Global Clinical Development at Indivior, Inc. Dr. Learned joined Indivior in 2015, after serving as the Vice President, Medicines Development Leader and Head of the Psoriasis and Atopic Dermatitis Care Areas at Stiefel, a GlaxoSmithKline (GSK) company. She spent nearly 20 years at GSK leading various global neurosciences clinical divisions.

JAMES NOTARO, '84
James Notaro, R.Ph., Ph.D., is the Founder and President of Clinical Support Services (CSS), Inc., a Buffalo-based provider of medication management solutions. Prior to founding CSS in 1999, he held executive positions with Univera Health Care and was Director of Managed Care Programs/Research & Development with Centrus, an Albany-based prescription benefit management company.

Board of Trustees

Wallace Pickworth '69
Wallace Pickworth, Ph.D., is a pharmacologist with extensive preclinical and clinical experience. He was with NIH for nearly 30 years from a post-doc position to a tenured staff scientist at the National Institute on Drug Abuse. For the past ten years, Dr. Pickworth has directed clinical research on tobacco and nicotine for Battelle as a Research Leader. He holds licenses to practice pharmacy in two states and serves as an adjunct faculty at two colleges of pharmacy.

David Stack, '76
David Stack is Chairman and CEO of Pacira Pharmaceuticals, Inc., a specialty pharmaceutical company focused on non-opioid medication products for pain management. Mr. Stack has shepherded several therapeutics through clinical development and FDA approval, including the successful commercial launch of the pain control product EXPAREL. In addition to his role with Pacira, Mr. Stack is also a Managing Director at MPM Capital, a venture capital firm focused on life sciences companies.

SCOTT TERRILLION, '85
Mr. Terrillion, J.D. is General Counsel at Cara Therapeutics since 2016. He oversees Cara’s legal and compliance functions and serves as company Secretary. Prior to this, he was Vice President and Associate General Counsel at Mesoblast Ltd., a regenerative medicine company. He began his career as Director of Pharmacy at Preferred Care (now MVP Health Care) before spending 17 years at Boehringer-Ingelheim in 1998, where he rose to the position of Vice President and Group General Counsel.

Board of Trustees

PAMELA WILLIAMSON

As the Principal and Founder of Williamson Biopharma Consulting, Pamela Williamson, RAC, FRAPS, MBA, is an independent consultant for the bio-pharmaceutical industry with more than 30 years of global leadership experience. Ms. Williamson has a strong track record in the successful development and registration of products to treat patients with serious and life-threatening rare diseases. She most recently served as SVP of Global Regulatory Affairs & Patient Safety at Alexion Pharmaceuticals.

Kenneth M. Nirenberg

Kenneth M. Nirenberg is a *Trustee Emeritus* of Albany College of Pharmacy and Health Sciences. He served as the Chair of the Board of Trustees from 1991-1997.

Alumni Council

The Albany College of Pharmacy and Health Sciences Alumni Council represents more than 6,000 graduates of the College. The Council is comprised of alumni volunteers from various class years and serves as the primary liaison between the alumni community and the ACPHS Administration, Board of Trustees, and Student Body. Membership in the Alumni Council is automatic upon graduation.

Working closely with the ACPHS Office of Institutional Advancement, the Council helps facilitate a variety of programs, activities, and communications to keep alumni connected to the College. These include: contributing to the *Alumni News* magazine, recruiting fellow classmates to attend alumni events, hosting Reunion Weekend activities, and assisting with special events on the Albany and Vermont Campuses.

Members of the Alumni Council also play a large role in the lives of current ACPHS students by contributing to the Innovation Fund (formerly Annual Fund), participating in the Alumni-Student Mentoring Program and career networking events, and promoting the importance of future alumni involvement.

For more information regarding ACPHS Alumni Council activities or to purchase *ACP* retro merchandise, please contact Bill Jabour, Assistant Vice President, at (518) 694-7304 or e-mail alumni@acphs.edu.

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

2018-19 Academic Calendar

FALL SEMESTER 2018

August 21-26	Orientation
August 27	First Day of Classes
August 31	Last Day to Add or Drop a Course
September 3	Labor Day – No Classes
September 4	Classes Resume
October 8	Columbus Day – No Classes
October 9	Classes Resume/Monday Schedule
October 26	Last Day to Withdraw from a Course
November 21-23	Thanksgiving Break
November 26	Classes Resume
December 10-14	Final Exams
December 15	Emergency/Make-Up Exams
December 17-January 11	Winter Break

SPRING SEMESTER 2019

January 14	First Day of Classes
January 18	Last Day to Add or Drop a Course
January 21	Martin Luther King Day – No Classes
January 22	Classes Resume
February 18	President's Day – No Classes
February 19	Classes Resume/Monday Schedule
March 11-15	Spring Recess – No Classes
March 22	Last Day to Withdraw from a Course
March 18	Classes Resume
May 1	Reading Day
May 2–8	Final Examinations
May 9	Emergency/Make-Up Exams
May 11	Commencement

SUMMER SESSION 2019

May 20	First Summer Session Begins (Monday)
May 27	Memorial Day (Monday) – No Classes
May 28	Classes Resume (Tuesday)
June 28	First Summer Session Ends (Friday)
July 1–July 5	Summer Break (Monday-Friday)
July 8	Second Summer Session Begins (Monday)
August 16	Second Summer Session Ends (Friday)

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

2019-20 Academic Calendar

FALL SEMESTER 2019

August 20-23	Orientation
August 26	First Day of Classes
August 30	Last Day to Add or Drop a Course
September 2	Labor Day – No Classes
September 3	Classes Resume
October 14	Columbus Day – No Classes
October 15	Classes Resume/Monday Schedule
October 25	Last Day to Withdraw from a Course
November 27-29	Thanksgiving Break
December 2	Classes Resume
December 9-13	Final Exams
December 14	Emergency/Make-Up Exams
December 16-January 10	Winter Break

SPRING SEMESTER 2020

January 13	First Day of Classes
January 17	Last Day to Add or Drop a Course
January 20	Martin Luther King Day – No Classes
January 22	Classes Resume
February 17	President's Day – No Classes
February 18	Classes Resume/Monday Schedule
February 20	Last Day to Withdraw from a Course
March 9-18	Spring Recess – No Classes
March 16	Classes Resume
April 29	Reading Day
April 30-May 6	Final Examinations
May 7	Emergency/Make-Up Exams
May 9	Commencement

SUMMER SESSION 2020

May 20	First Summer Session Begins (Monday)
May 25	Memorial Day (Monday) – No Classes
May 26	Classes Resume (Tuesday)
June 26	First Summer Session Ends (Friday)
June 29–July 3	Summer Break (Monday-Friday) – confirming with HR
July 6	Second Summer Session Begins (Monday)
August 16	Second Summer Session Ends (Friday)

ACPHS Accreditation

Albany College of Pharmacy and Health Sciences holds accreditation from the Middle States Commission on Higher Education (MSCHE), located at 3624 Market Street, Philadelphia, PA 19104. Their phone number is (267) 284-5000.

During our last Middle States review which culminated in 2010, ACPHS received the then maximum 10-year reaccreditation. The process to extend our accreditation began in 2018 and will continue through spring 2020. For additional information and updates, please visit our Middle States Reaccreditation web page.

MSCHE is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Commission on Recognition of Postsecondary Accreditation. The curriculum of each undergraduate or graduate program is approved by the New York State Department of Education.

MSCHE examines each institution as a whole, rather than specific programs within institutions. The below ACPHS programs are accredited separately. The length of each accreditation cycle is determined by the respective accrediting body.

Doctor of Pharmacy (Pharm.D.)

The College's Doctor of Pharmacy program holds accreditation from the Accreditation Council for Pharmacy Education (ACPE), located at 135 S. LaSalle Street, Suite 4100, Chicago, IL 60603-4810. Their telephone number is (312) 664-3575. Unresolved issues related to ACPE accreditation standards may be brought to ACPE's attention. The program is accredited through 2019.

Clinical Laboratory Sciences

The College's Clinical Laboratory Sciences programs hold accreditation from the National Accrediting Agency for Clinical Laboratory Sciences (NACCLS), located at 5600 N. River Road, Suite 720, Rosemont, IL 60018-5119. Their telephone number is (847) 939-3597 or (773) 714-8880. The program is accredited through 2019.

Cytotechnology

The College's Cytotechnology program holds accreditation from the Commission on Accreditation of Allied Health Education Programs (CAAHEP), upon the recommendation of the Cytotechnology Programs Review Committee of the American Society of Cytopathology. CAAHEP is located at 1361 Park Street, Clearwater, FL 33756. Their telephone number is (727) 210-2350. The program is accredited through 2025.

UNDERGRADUATE ADMISSIONS

IMPORTANT DEADLINES FOR FRESHMAN APPLICANTS

NOVEMBER 1
Early Decision I Application Deadline
Free Application for Federal Student Aid (FAFSA) Deadline (Early Decision Applicants)

DECEMBER 1
Early Action Application Deadline
Free Application for Federal Student Aid (FAFSA) Deadline (Early Action Applicants)

FEBRUARY 1
Regular Decision Priority Deadline
Free Application for Federal Student Aid (FAFSA) Deadline *(Regular Decisions Applicants)*
Deposit and Enrollment Confirmation Deadline *(Early Decision applicants)*

MAY 1
Deposit and Enrollment Confirmation (Early Action and Regular Decision applications

EARLY DECISION

The Office of Undergraduate Admissions encourages qualified candidates who have selected ACPHS as their first choice to apply under the Early Decision program. Review of Early Decision Applications will be prioritized, and these applicants will receive their admissions and scholarship decisions earlier than other applicants. . Early Decision is a binding agreement, and those admitted are required to submit an enrollment confirmation and non-refundable tuition deposit by February 1.

EARLY ACTION AND REGULAR DECISION

To ensure full consideration and a place in the incoming class, we highly recommend that the completed application be submitted by December 1 (for non-binding Early Action) or by February 1 (for Regular Decision). We will continue to review applications after the priority deadline as long as space remains available.

INSTRUCTIONS FOR EARLY DECISION, EARLY ACTION, AND REGULAR DECISION

An application for freshmen admission is reviewed when the file is complete. Students may apply by submitting the Common Application online at www.commonapp.org. The application must be submitted to the College along with the required $75 non-refundable fee, unless this fee is waived by the Office of Admissions. The following materials also must be sent to the Office of Admissions:

- Official high school transcript(s) from all secondary schools attended, including most recent grades.
- Official transcripts from any colleges or universities attended.
- Official reports of standardized test scores, either Scholastic Aptitude Test (SAT) or American College Testing Program Examination (ACT).
- Official reports from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS), if the applicant has studied for fewer than 4 years where English is the language of instruction. A minimum score of 84 on the TOEFL or a minimum of 6.5 on the IELTS must be achieved to be considered for admission.
- Two (2) letters of recommendation (one from your guidance counselor and one from a mathematics or science teacher).

Transcripts

Transcripts must clearly indicate all credits and grades received and indicate coursework currently in progress. All transcripts must be official. If mailed, they must be presented in a sealed envelope with the institution's stamp or an official's signature across the closure. Photocopies and hand-carried documents not in a sealed, stamped envelope are not accepted.

All deposited students are expected to submit a final high school transcript by the first day of classes. Failure to meet this requirement will result in forfeiture of the offer of admission.

Standardized Tests

Freshmen applicants are required to submit official reports of standardized test scores as follows:

- Applicants for freshmen admission are required to submit official test scores from either the SAT or the ACT. ACPHS recommends, but does not require, that applicants submit the optional SAT essay and/or the optional ACT writing test, as these may be used for course placement determinations. The SAT code for the College is 2013. The ACT code is 2672. If both SAT and ACT scores are submitted, the higher score will be considered.
- Deposited students may be required to complete additional writing assessments prior to the first day of classes at the request Chair of the Department of Humanities and Communications.

Applicants must be at least 16 years old. The course of study must have included the following college preparatory coursework:

- English, 4 years 4 units
- Mathematics, 4 years (including pre-calculus) 4 units
- Science, 3 years (including chemistry) 3 units
- Academic college preparatory electives 6 units

Note: Physics and/or Calculus are recommended.

REQUIRED HEOA DISCLOSURE FOR UNDERGRADUATE ADMISSIONS

The Office of Admissions will confirm all students' transcripts that arrive from a high school with a CEEB code, as well as the high school seal and/or signature. If a transcript is from a high school that lacks a CEEB code or seal/signature, the Office of Admissions will investigate to confirm the school is recognized by the state department of education or home school association. The Office of Admissions requires a final and official copy of the student's transcript in the admission verification process. If a diploma is determined invalid, a GED may be required for admission consideration. International students must submit a copy of the completed Foreign Education Credential Evaluation Form from the World Education Service (WES). Transfers students who have not completed a previous college degree are required to submit an official high school transcript. Should a discrepancy be found through the Institutional Summary Information Report (ISIR), the Office of Financial Aid will reach out to the Office of Admissions for follow up.

Applicants are required to select a degree program when completing an application for admission. Applicants will be processed as long as space remains available in the class. Once a student is notified of acceptance, a non-refundable deposit of $400, along with the signed Enrollment Confirmation Form, will be required to reserve a place in the incoming freshman class as long as space remains available. In the event that enrollment exceeds capacity, ACPHS reserves the right to return the admission deposit based on the date received. Accepted freshmen applicants must complete their senior year of high school successfully and submit a final transcript and all required preregistration forms to the Office of Admissions prior to enrollment. Failure to submit a final transcript and all required forms may result in the withdrawal of a student's acceptance. The College reserves the right to use a wait list for qualified students.

Note: A person who has been convicted of a misdemeanor or felony related to drug use or sale may not be eligible for the pharmacy licensing examination. To determine eligibility, contact the New York State Board of Pharmacy, Cultural Education Center, Room 3035, Albany, NY 12230, or online at www.op.nysed.gov/pharm.htm.

TRANSFER CREDIT FOR ADVANCED PLACEMENT (AP), COLLEGE LEVEL EXAMINATION PROGRAM (CLEP) AND INTERNATIONAL BACCALAUREATE DIPLOMA PROGRAM (IB)

ACPHS grants advanced standing in the form of credit hours to entering students who, on the basis of performance on the College Board Advanced Placement Examinations, demonstrate proficiency in English, literature, calculus, general chemistry, general biology, statistics, physics and selected humanities courses. A minimum score of 4 must be obtained to receive course credit. It is important to note, however, that it is not always in the student's best interest to have credit awarded (especially for science courses). To receive credit for the College Level Examination Program (CLEP) examinations, a score of 70 or better must be achieved. CLEP credits will only be accepted for elective courses. The College recognizes the International Baccalaureate Diploma Program (IB) and grants up to six elective course credits for superior performance on the Higher Level examinations, provided that the exams cover fields of study represented by the College's academic offerings. Students who have completed the IB curriculum ordinarily will be granted, on matriculation at ACPHS, one course credit for each score of 6 or 7 on the Higher Level examinations. These credits may be used to reduce the number of elective courses required for graduation, but normally may not be used to satisfy any other degree requirement. Students who wish to receive credit for AP, CLEP, IB, or prior college coursework must make their request to the College, as well as provide all supporting documentation no later than August 1 of their start year for students beginning in the fall semester, or January 15 for students beginning in the spring semester. The granting of additional credits will not be considered after this date. All decisions regarding transferring of credit are final at point of matriculation.

EARLY ADMISSION

Applicants who complete all freshmen admission requirements at the end of the third year of high school will be considered on the same basis as four-year graduates.

RETURN OF TITLE IV FUNDS POLICY

Albany College of Pharmacy and Health Sciences uses the revised policy of Return of Title IV Funds as amended in section 484B of the Higher Education Act of 1965. Each student receiving Title IV assistance will have his or her financial award recalculated to adhere with federal regulations. Federal funds will be returned when required by law. The Return of Title IV Funds (Return) regulations dictate the statutory schedule used to determine the amount of Title IV funds (federal student aid) a student has earned as of the date he or she ceases attendance. The amount of Title IV program assistance earned is based on the amount of time the student spent in academic attendance; it has no relationship to the student's incurred institutional charges. Up through the 60 percent point in each payment period or period of enrollment, a pro rata schedule is used to determine the amount of Title IV funds the student has earned at the time of withdrawal. After the 60 percent point in the payment period or period of enrollment, a student has earned 100 percent of the Title IV funds. The Return regulations do not prohibit a school from administering its own refund policy or complying with refund policies required by state or other outside agencies. Although an institutional, state or agency refund policy will determine the charges a student will owe after withdrawing, those policies will not affect the amount of aid the student has earned under the Return calculation.

FINANCIAL AID

Many students will be assisted by grants, scholarships and loans from state and federal governments, the College and other private agencies. All students are expected to apply for federal and state grants, scholarships and loan programs for which they may be eligible. Approximately95 percent of current students have received some assistance. Total assistance for 2018-19 Grants and Scholarships- $15,052,601; Loans – $31,085,550.

FEDERAL STUDENT AID APPLICATION PROCESS

Students must file the Free Application for Federal Student Aid (FAFSA) each year in order to determine financial aid eligibility. Students may file the FAFSA online at www.fafsa.ed.gov as early as October 1st. Students without internet access may request a paper FAFSA by calling 1-(800) 4FED-AID. The Federal School Code for Albany College of Pharmacy and Health Sciences is 002885 and must be reported on the FAFSA. New students are required to file the FAFSA by the admissions application deadline for the following academic year. Returning students are required to file the FAFSA by March 1 for the following academic year. Once the FAFSA is processed, the *Institutional Student Information Record* (ISIR) is made available electronically to the schools the student listed on the FAFSA and the *Student Aid Report* (SAR) is made available to the student online.

SPECIAL CONSIDERATIONS FOR DOCTOR OF PHARMACY STUDENTS

Students may be admitted to the College in the first or second pre-pharmacy years or the first professional year in the Doctor of Pharmacy program. The Doctor of Pharmacy program is registered as and considered undergraduate level for the first two pre-professional years. It is important to note that the first and second professional years are also considered undergraduate level for financial aid purposes. Students will be considered graduate/professional level only for the third and fourth professional years when determining financial aid eligibility. Therefore, student eligibility for federal and state scholarships, grants and loans will be determined for all Doctor of Pharmacy students using this framework. Completion of a prior degree is not a determinant of undergraduate or graduate status for financial aid eligibility. When completing the Free Application for Federal Student Aid (FAFSA) for the upcoming year, Doctor of Pharmacy students enrolled in the pre-professional, first or second professional years must report grade level and degree level in the undergraduate categories. Doctor of Pharmacy students in the third and fourth professional year must report grade level and degree level as graduate/professional.

ELIGIBILITY

The student's **Cost of Attendance** (COA) at the College is determined, within guidelines established by federal law. The student's COA includes:

- tuition and fees
- room and board expenses while attending school
- allowances for books and supplies
- transportation
- laptop (students new to ACPHS)
- personal expenses (shampoo, toothpaste, laundry expense, etc.)
- loan fees for federal student loans (if applicable)
- dependent-care costs (if applicable)
- costs related to a disability (if applicable)

The student's **Expected Family Contribution** (EFC) appears on the *Institutional Student Information Record* (ISIR) or *Student Aid Report (*SAR). The EFC is used to determine whether a student is eligible for federal student aid. The EFC is calculated using a formula established by Congress to determine the amount that a student's family is expected to contribute toward the student's cost of attendance.

The student's **Unmet Financial Need** (UFN) is determined using the formula: COA – EFC = UFN. Students must have unmet need in order to qualify for need-based aid. Need-based awards are limited and offered on a first-come, first-served basis to students who meet the College's financial aid deadlines.

VERIFICATION POLICY

According to the College's policy, the Office of Financial Aid is required to review all ISIR/SAR records selected for verification review by the federal processor, as well as those selected by the College. Students selected for verification must submit documentation to support certain information reported on the FAFSA. Students selected for verification must submit the following: copies of student, spouse and/or parent(s) previous year's signed IRS Tax Return Transcripts or complete the IRS Data Retrieval Process, all applicable W-2 forms and a federal verification worksheet. These items are due to the Office of Financial Aid by May 1. Students subsequently selected for verification after May 1 are required to submit these documents within 60 days of written notification from the Office of Financial Aid. The Office of Financial Aid cannot process financial aid awards for students who do not meet the above deadlines.

STANDARDS OF SATISFACTORY ACADEMIC PROGRESS

Students who receive financial aid must make satisfactory academic progress to remain eligible for federal, state and institutional aid. This section outlines satisfactory academic progress requirements pertaining to financial aid eligibility. These requirements are independent of the Academic Progression requirements. ***(See Academic Regulations for more information.)***

STANDARDS OF ACADEMIC PROGRESS (SAP)

Federal regulations require the Office of Financial Aid to monitor the academic progress of students attending Albany College of Pharmacy and Health Sciences. It is important to note Standards of Academic Progress (SAP) are separate from, and in addition to, the Academic Standing policy and progression requirements established in the Academic Regulations section of the catalog. All students, regardless of major, grade level, and course load will be evaluated with the same standards for federal and institutional aid eligibility.

FREQUENCY OF SAP EVALUATIONS

The Office of Financial Aid will review SAP annually in June, after spring semester grades are posted. This standard is stricter than the College's Academic Standing policy for students who are not receiving Title IV Assistance.

QUALITATIVE STANDARD

All students must be in good academic standing with the College. Students enrolled in a Bachelor's of Science degree or the Doctor of Pharmacy degree must maintain a minimum cumulative grade point average (GPA) of 2.0 at the end of each academic year. Beginning in the 2011-2012 academic year, all Doctor of Pharmacy students must have a minimum cumulative grade point average (GPA) of 2.5 to graduate. Students enrolled in a Master's degree program must maintain a minimum cumulative grade point average (GPA) of 3.0 at the end of each academic year. In addition, the Higher Education Act requires that all students, at the end of their second academic year, have a cumulative GPA of at least a "C" or have an academic standing consistent with their program's graduation requirements.

QUANTITATIVE STANDARD (PACE OF PROGRESSION)

All students must progress toward degree completion at a defined cumulative rate. Completed coursework is defined as any course for which a student receives a passing grade.

Doctor of Pharmacy Example:

	Fall Semester	Spring Semester	Total Attempted (Cumulative)	Must earn at least (Cumulative)
1st Year	17	18	35	35 hours x 50% = 18 credit hours
2nd Year	18	17	70	70 hours x 67% = 47 credit hours
3rd Year	16	18	104	104 hours x 67% = 70 credit hours
4th Year	18	17	139	139 hours x 67% = 93 credit hours
5th Year	18	18	175	175 hours x 85% = 149 credit hours
6th Year	18	18	211	211 hours x 95% = 200 credit hours

Master's Degree Example:

	Fall Semester	Spring Semester	Total Attempted (Cumulative)	Must earn at least: (Cumulative)
1st Year	9	9	18	18 hours x 67% = 12 credit hours
2nd Year	9	9	36	36 hours x 67% = 24 credit hours

Bachelor's Degree Example:

	Fall Semester	Spring Semester	Total Attempted (Cumulative)	Must earn at least : (Cumulative)
1st Year	16	17	33	33 hours x 67% = 22 credit hours
2nd Year	16	17	66	66 hours x 67% = 44 credit hours
3rd Year	15	19	100	100 hours x 67% = 67 credit hours
4th Year	16	16	132	132 hours x 67% = 88 credit hours

PROCESS FOR INCOMPLETES, WITHDRAWALS, REPETITIONS, AND TRANSFER OF CREDIT FROM OTHER SCHOOLS

Course incompletes and withdrawals are counted as attempted coursework when reviewing SAP. For repeated courses, neither repeated grades nor original grades of that same course earned at other colleges will contribute to the student's GPA at ACPHS. Transfer credits will be counted in the quantitative status but not the qualitative status. Students who change their major will be placed on the chart for the semester in which they are entering.

LOSS OF FINANCIAL AID ELIGIBILITY

If students fail to maintain SAP, they will lose eligibility until they raise their cumulative GPA to the minimum standard and/or by making up the credit deficiency.

APPEALS

Students who fail to make SAP due to very serious circumstances, such as injury, illness, the death of a relative, or other special circumstances, which caused a major disruption to their ability to successfully complete their course work may appeal the loss of that aid to the Director of Financial Aid.

Students must submit a letter to the Director of Financial Aid along, with documentation to substantiate the unusual or extraordinary circumstance that prohibited the student from making SAP. This must include a comprehensive description of the circumstance(s) and documentation from ***at least two*** qualified persons (other than family and friends) who can verify the information.

In addition, students must explain what has changed with their situation that will allow the student to meet SAP requirements at the next evaluation. In cases of student injury, student illness or death of an immediate family member, the Director of Financial Aid may decide to review the appeal before proceeding to the Financial Aid Appeals Committee. The student must submit a letter of appeal and associated documentation to his/her case by August 1. Within 2-4 weeks of receiving the letter, the Financial Aid Appeals Committee will review the appeal, make a recommendation and send a letter of response.

FINANCIAL AID PROBATION

The status of probation is assigned to a student who is failing to make SAP ***and*** who successfully appealed their loss of financial aid eligibility. Students in this status will have their financial aid reinstated for one payment period. At the end of that payment period students will be reevaluated for federal and institutional aid eligibility.

ACADEMIC PLAN

If the Financial Aid Appeals Committee determines, based on the student's appeal, that it will take more than one payment period for the student to meet progress standards, a status of probation will be assigned and an academic plan will be developed. Students in this status will have their progress reviewed at the end of one payment period to determine if the student is meeting the requirements of the academic plan. If the academic plan is being followed, the student will regain Federal Student Aid eligibility as long as they continue to meet the requirements set forth in the academic plan. Students may appeal to change their academic plan by explaining what has happened to make the change necessary and how they will continue to make SAP.

REESTABLISHING AID ELIGIBILITY

If students fail to maintain SAP, they may regain eligibility by raising their cumulative GPA to the minimum standard and/or by making up the credit deficiency without the benefit of federal or institutional aid.

MAXIMUM TIME FRAME FOR DEGREE COMPLETION

Students must complete their degree within the maximum timeframe of 150% of the published length of the academic program. Students enrolled in the Doctor of Pharmacy Program must complete their education objective within a period of nine years (6 years x 150%). A student enrolled in any of the Bachelor's degree programs must complete his/her educational objective within a period of six years (4 years x 150%). A student enrolled in a Master's degree program must complete his/her educational objective within a period of 150% of the length of their program.

SPECIAL CONSIDERATIONS

CONSORTIUM AGREEMENT POLICY WITH OTHER INSTITUTIONS

The Office of Financial Aid adheres to the External Cross Registration Policy, which includes a voluntary consortium of the public and independent colleges within the Capital Region, as our consortium agreement policy. Students interested in registering for classes at member institutions during the fall and spring semesters may contact the registrar at ACPHS for additional information. Students approved to attend a course at member institutions during the fall and spring semesters will not be charged additional tuition for the coursework. The association does not permit summer semester attendance. Students interested in applying for financial aid for approved coursework during the summer semester must complete a separate consortium agreement form, available in the Office of Financial Aid.

STUDENT LOANS

Private student loans are certified for one academic year. Funds are disbursed in two installments, one each for fall and spring semesters during the loan period. Students will be advised of the disbursement amounts through the online financial aid system.

SUMMER SESSIONS AND/THE FOURTH PROFESSIONAL YEAR OF THE DOCTOR OF PHARMACY PROGRAM

- Summer sessions I and II are combined to reflect one summer semester for financial aid purposes.

- Federal student aid eligibility for the summer semesters is determined using the summer as a header term for the upcoming award year. For example, students would file the 2018-19 FAFSA for financial aid during the summer 2018 semester.

- The financial aid award year begins July 1, 2018 for the 2018-19 academic year. Therefore, federal funds for summer semester will not be disbursed until July 1 or thereafter. Funds may be disbursed as early as July 1 for students enrolled in six or more credits in Summer Session I. Funds will be disbursed after the start of Summer Session II for students enrolled in less than six credits in Summer Session I.

- All student loans (federal or private) are disbursed each academic year using multiple disbursements. Federal Stafford loans for a given academic year (two semesters) are disbursed in two equal installments, one for each semester. Disbursement of funds for the second semester cannot occur until after the mid-point of the loan period.

- The academic year for students in the fourth professional year of the Doctor of Pharmacy program encompasses pharmacy practice experience rotation modules A – I for the 2018-19 year. Module J will be used for make-up rotations only. Fall 2018 semester includes modules A – E; spring 2019 semester includes modules F – I. Institutional aid will be disbursed after July 1, 2018. Student aid for spring 2019 semester will be disbursed after the mid-point of the loan period. (See Calendars at the beginning of the Catalog for more details).

- Private student loans for summer students are certified for one academic year. Funds are disbursed in three installments, one each for summer, fall and spring semesters during the loan period. Disbursements may not be divided equally if enrollment is less than full-time during the summer semester. Students will be advised of the disbursement amounts through the online financial aid system.

FINANCIAL AID WAITLIST PROCESS

The Office of Financial Aid uses a waitlist process to award funds should any become available due to student attrition. Students may request to be placed on the wait list by submitting the Financial Aid Waitlist Application to the Office of Financial Aid on or after August 1. This application is available through the online financial aid system. Waitlist requests will be reviewed by the Financial Aid Appeals Committee late in the spring semester, on a first-come, first-served basis, and must be filed every year.

Updated July, 2018

FEDERAL GRANTS & LOANS

FEDERAL GRANTS

FEDERAL PELL GRANTS

Students may apply for the federal Pell grant by filing the FAFSA. Grants are available to students who qualify, based upon need as determined by the federal methodology formula. The Office of Financial Aid must receive a valid ISIR for processing of the Pell grant payment. Awards range from $650 to $6095 per year for full-time enrollment, contingent upon congressional approval of funds and the expenses at the College. Students must maintain satisfactory progress toward their first undergraduate degree.

FEDERAL SUPPLEMENTAL EDUCATIONAL OPPORTUNITY GRANT

Awards may range from $320 to $1,600 per year for Pell-eligible students. Funds are limited and are awarded on a first-come, first-served basis to students with the greatest need. Students filing the FAFSA are automatically considered, based on financial need.

VETERANS ADMINISTRATION EDUCATIONAL BENEFITS

Chapters 30, 32, 33, 35 and 1606 of the U.S. Code established federal rules and regulations for educational benefits for veterans and their dependents. The benefits are administered as monthly stipends by the Veterans Administration. Veterans also may receive contributory benefits if they choose to participate in this program during their service in the military. Applications and information are available at the local Veterans Administration offices. Additional information concerning benefits is also available online at www.gibill.va.gov.

BUREAU OF INDIAN AFFAIRS SCHOLARSHIP

Eligibility is restricted to students with financial need who are at least one-fourth American Indian, Eskimo or Aleut and are enrolled members of a tribe, band or group recognized by the Bureau of Indian Affairs Office. Application must be made each year through the NY Liaison Office, Federal Building, Room 523, South Clinton Street, Syracuse, NY 13202. In addition, first-time applicants must obtain tribal certification from the bureau agency or tribal office that records the enrollment for the tribe.

FEDERAL LOAN PROGRAMS

Federal student loans are available to students to help meet educational expenses. Federal student loan programs offer low interest rates and, when used with discretion, provide an affordable option to meet the cost of a quality education. The College participates in the Federal Direct Loan program. Students should complete the Electronic Master Promissory Note (E-MPN) for the Stafford, Parent Loan for Undergraduate Student (PLUS) and Graduate PLUS programs at www.studentloans.gov. The E-MPN is a 10-year serial promissory note used for all Stafford and PLUS loan borrowing while attending the College. Students will complete the Stafford loan E-MPN during the first year of attendance. Annual eligibility for Stafford loans will be communicated through the online financial aid system. Students must accept or decline Stafford loan funds through that system annually. Transfer students or students with prior loan history will be required to complete a new Stafford loan E-MPN in order to borrow at ACPHS. Parents interested in borrowing the PLUS loan will complete the PLUS E-MPN during the student's first year of attendance. Parents must apply for a loan annually. Graduate students interested in borrowing the Graduate PLUS loan will complete the PLUS E-MPN. Students and parents may complete the E-MPN forms by logging into **www.studentloans.gov**. Students and parents without internet access may request paper MPN forms directly from the Office of Financial Aid. The Stafford and PLUS E-MPN forms must be submitted to the US Department of Education, P.O. Box 5692, Montgomery, AL 36103, by June 1 to ensure payment for fall semester expenses. All federal loans are certified for a full academic year (two semesters). Federal loans are disbursed in two payments, with approximately one-half of the total loan amount disbursed each semester.

FEDERAL DIRECT SUBSIDIZED STAFFORD LOANS

The Federal Direct Subsidized Stafford loan is available to students with financial need. Repayment of the loan

begins six months after the student graduates, withdraws or drops to less than half-time attendance. The interest is subsidized (paid) by the federal government during in-school periods.

FEDERAL DIRECT UNSUBSIDIZED STAFFORD LOANS
Eligibility for this program is not based upon financial need. The borrower is responsible for the interest that accrues while in school. Repayment of the loan principal begins six months after the student graduates, withdraws or drops to less than half-time attendance. Borrowers may receive both subsidized and unsubsidized Federal Direct Stafford loans totaling up to the applicable Stafford limit if they do not qualify for the total amount permitted under the Federal Direct Subsidized Stafford loan program.

DIRECT STAFFORD LOAN ANNUAL LIMITS:

DEPENDENT UNDERGRADUATE STUDENTS

Freshman: $5,500 ($3,500 between base subsidized and unsubsidized, plus an additional $2,000 unsubsidized)
Sophomore: $6,500 ($4,500 between base subsidized and unsubsidized, plus an additional $2,000 unsubsidized)
Junior or Senior: $7,500 ($5,500 between base subsidized and unsubsidized, plus an additional $2,000 unsubsidized)

Aggregate Loan Limits
$31,000 (up to $23,000 may be subsidized)

INDEPENDENT UNDERGRADUATE AND GRADUATE STUDENTS

Freshman: $9,500 ($3,500 between base subsidized and unsubsidized, plus an additional $6,000 unsubsidized)
Sophomore: $10,500 ($4,500 between base subsidized and unsubsidized, plus an additional $6,000 unsubsidized)
Junior or Senior: $12,500 ($5,500 between base subsidized and unsubsidized, plus an additional $7,000 unsubsidized)
Graduate/Professional: $20,500 unsubsidized
Doctor of Pharmacy Only: $33,000 unsubsidized

Aggregate Loan Limits
$57,500 (including $23,000 base subsidized and unsubsidized) for undergraduate students
$138,500 (up to $65,500 may be subsidized) for students in Master Degree programs
$224,000 (up to $65,000 may be subsidized) for students in the Doctor of Pharmacy program

Direct PLUS LOAN ANNUAL LIMITS:

Parent PLUS loan
Cost of attendance minus other financial aid, per dependent student

Graduate PLUS loan
Cost of attendance minus other financial aid

Aggregate Loan Limits
None

FEDERAL DIRECT STAFFORD LOAN INTEREST RATES

The interest rate for undergraduate unsubsidized loans made after July 1, 2015 is fixed at 4.29%. The following schedule shows the annual changes in the fixed interest rates on undergraduate subsidized loans:

- 3.86% for loans first disbursed between 7/1/13 - 6/30/14
- 4.66% for loans first disbursed between 7/1/14 - 6/30/15
- 4.29% for loans first disbursed between 7/1/15 - 6/30/16
- 3.76% for loans first disbursed between 7/1/16 - 6/30/17
- 4.45% for loans first disbursed between 7/1/17 - 6/30 /18
- 5.045% for loans first disbursed between 7/1/2018 – 6/30/2019

The interest rates for graduate and professional unsubsidized loans first disbursed between 7/1/2018and 6/30/2019 is fixed at 7.595%.

FEDERAL DIRECT PLUS AND FEDERAL DIRECT GRADUATE PLUS LOAN INTEREST RATES

The interest rate for Direct PLUS Loans is a fixed rate of 7.595% Interest is charged on Direct PLUS Loans during all periods, beginning on the date of your loan's first disbursement. In addition to interest, you pay a loan origination fee that is a percentage of the principal amount of each Direct PLUS Loan that you receive. This fee helps reduce the cost of making these low-interest loans. The US Department of Education will deduct the fee before you receive any loan money, so the loan amount you actually receive will be less than the amount you have to repay. Dependent students whose parents have applied for, but were unable to obtain a PLUS Loan, are eligible to receive additional Direct Unsubsidized Stafford Loan funds.

FEDERAL DIRECT CONSOLIDATION LOAN

Students who wish to consolidate their federal loans may be able to combine their loans into one loan with a fixed interest rate based on the average of the interest rate of the loans being combined. Vist www.studentloans.gove for additional information.

FEDERAL DIRECT LOAN REPAYMENT OPTIONS

For federal student loans in grace or repayment status. This program allows students to combine their debt into one lower payment. Repayment Schedules available:

- Standard Repayment Plan
- Graduated Repayment Plan
- Extended Repayment Plan
- Revised Pay As You Earn Repayment Plan (REPAYE)
- Pay As You Earned Plan (PAYE)
- Income Contingent Repayment Plan (ICR)
- Income-Based Repayment Plan (IBR)
- Income Sensitive Repayment Plan

Interest Rate: Weighted average with 8.25% cap

FEDERAL HEALTH PROFESSIONS STUDENT LOAN

The HPSL program is offered by ACPHS to Doctor of Pharmacy students in the professional years of the program demonstrating financial need through an analysis of the FAFSA. Verified Income and resources of student, spouse and parent(s) must be considered, regardless of the dependency status of a student. The maximum loan is $2,500 plus tuition, not to exceed total costs less all resources. This loan carries a 5% interest rate, which does not accrue until 12 months after graduation or termination of studies. Students awarded a HPSL loan will complete a Master Promissory Note with the College. Funds are extremely limited.

FEDERAL WORK STUDY

Funded through federal and College funds. Eligibility is based upon financial need and the receipt of a valid FAFSA by the priority deadline. Students exhibiting financial need may seek a work study position on campus or at an approved off-campus site. Students working on-campus are paid an hourly wage and generally work 3 to 6 hours per week during the academic year. Students may work up to a maximum of 20 hours per week in extraordinary cases, with permission from the Vice President of Enrollment Management.

Updated July 2018

INSTITUTIONAL AID

ACPHS offers institutional scholarships and grants based upon established criteria of merit and/or need as noted. All awards are based upon full-time enrollment each semester, unless otherwise indicated. Need-based scholarships require the student to file the FAFSA each year by the published priority deadlines of February 1, for new students, and March 1, for returning students. New recipients must be accepted for enrollment. Renewal recipients must be full-time matriculated students, maintaining standards of satisfactory academic progress. All awards are subject to adjustment due to changes in enrollment status, or receipt of other federal, state or private funds. In addition, awards will be adjusted as part of required corrections or verification of data reported on the student's federal ISIR. The Office of Financial Aid will evaluate eligibility annually, based upon issuance of final grades for spring term. Awards will be renewed on a first-come, first-served basis until funds are expended. Awards may not be renewed to students who do not adhere to the FAFSA filing deadline of March 1. Awards will not be renewed to students with incomplete financial aid paperwork after May 1.

Presidential Scholarships, Dean's Scholarships, ACPHS Merit Scholarships, Trustee Scholarships and Trustee Grants will be renewed for a maximum of 11 semesters for students pursuing the Doctor of Pharmacy degree. Trustee Scholarships, Trustee Grants, Pharmaceutical Sciences Scholars Awards, Biomedical Technology Scholars Awards, Health and Human Sciences Scholars Awards, Microbiology Scholars Awards, Clinical Laboratory Sciences Scholars Awards and Trustee Scholarships for bachelor's degrees will be renewed for a maximum of seven semesters for students pursuing a bachelor's degree. All award criteria may be subject to change by the College.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES PRESIDENTIAL SCHOLARSHIP
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College based upon superior academic achievement in high school. The Presidential Scholarship is renewed each year provided the student maintains a cumulative overall GPA of 3.2 or better. Although eligibility for this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES DEAN'S SCHOLARSHIP
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College based upon honorable academic achievement in high school. The Dean's Scholarship is renewed each year provided the student maintains an overall cumulative GPA of 3.0 or better. Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES MERIT SCHOLARSHIP
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College based upon honorable academic achievement in high school. The Merit Scholarship is renewed each year provided the student maintains an overall cumulative GPA of 2.9 or better. Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES TRUSTEE MERIT SCHOLARSHIP
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College based upon honorable academic achievement in high school. The Trustee Merit Scholarship is renewed each

year provided the student maintains an overall cumulative GPA of 2.8 or better. Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES SPECIAL RECOGNITION SCHOLARSHIP
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College based upon honorable academic achievement in high school. The Special Recognition Scholarship is renewed each year provided the student maintains an overall cumulative GPA of 2.5 or better. Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES VALEDICTORIAN SCHOLARSHIP
ACPHS offers a one time, non-renewable tuition scholarships to qualified entering freshmen upon admission to the College who were ranked first in their class by their high school. . Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES SALUTATORIAN SCHOLARSHIP
ACPHS offers a one time, non-renewable tuition scholarships to qualified entering freshmen upon admission to the College who were ranked second in their class by their high school. Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES PRESIDENT'S ENDOWMENT FOR EXCELLENCE
Each year the committee representing the President's Endowment for Excellence Scholarship selects one entering freshman for the scholarship. The recipient must be one of the top 10 freshmen applicants to the College for the given year. The scholarship is awarded on the basis of academic merit. The scholarship will be renewed for a maximum of six years or until the student leaves or graduates from the College. The student must maintain a 3.0 overall cumulative GPA for continued renewal of the scholarship. The recipient is encouraged to participate in the program of the annual President's Cup Golf Tournament each summer. Renewed eligibility for the scholarship will be reviewed annually.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES VERMONT FOUNDER'S SCHOLARSHIP
ACPHS offers this merit scholarship to qualified transfer students attending the Vermont campus. Students must maintain a 3.5 overall cumulative GPA for continued renewal of the scholarship. Although this scholarship is based upon academic merit, students are encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES BIOMEDICAL TECHNOLOGY EXCEL AWARD
ACPHS offers tuition scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree program in Biomedical Technology, who exhibit honorable academic achievement in high school. The Biomedical Technology Excel Award is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.5 or greater and continued enrollment in the Biomedical Technology program. This award will be discontinued should the student change his/her program of study. Although this scholarship is based upon academic merit, students are strongly encouraged to complete the FAFSA each year. Intel International Science and Engineering award recipients will be considered for this award.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES CLINICAL LABORATORY SCIENCES SCHOLARSHIP

ACPHS offers tuition scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree program in Clinical Laboratory Sciences, who exhibit honorable academic achievement in high school. The Clinical Laboratory Sciences Scholarship is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.5 or greater and continued enrollment in the Clinical Laboratory Sciences program. This award will be discontinued should the student change his/her program of study. Although this scholarship is based upon academic merit, students are strongly encouraged to complete the FAFSA each year.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES HEALTH AND HUMAN SCIENCES SCHOLARSHIP

ACPHS offers tuition scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree program in Health and Human Sciences, who exhibit honorable academic achievement in high school. The Health and Human Sciences Scholarship is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.5 or greater and continued enrollment in the Health and Human Sciences program. This award will be discontinued should the student change his/her program of study. Although this scholarship is based upon academic merit, students are strongly encouraged to complete the FAFSA each year.

ALBANY COLLEGE OF PHARMACY MICROBIOLOGY SCHOLARSHIP

ACPHS offers tuition scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree program in Microbiology, who exhibit honorable academic achievement in high school. The Microbiology Scholarship is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.5 or greater and continued enrollment in the Microbiology program. This award will be discontinued should the student change his/her program of study. Although this scholarship is based upon academic merit, students are strongly encouraged to complete the FAFSA each year.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES PHARMACEUTICAL SCIENCES SCHOLARSHIP

ACPHS offers tuition scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree program in Pharmaceutical Sciences, who exhibit honorable academic achievement in high school. The Pharmaceutical Sciences Scholarship is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.5 or greater and continued enrollment in Pharmaceutical Sciences program. This award will be discontinued should the student change his/her program of study. Although this scholarship is based upon academic merit, students are strongly encouraged to complete the FAFSA each year.

ALBANY COLLEGE OF PHARMACY PUBLIC HEALTH SCHOLARSHIP

ACPHS offers tuition scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree program in Public Health, who exhibit honorable academic achievement in high school. The Public Health Scholarship is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.5 or greater and continued enrollment in the Public Health program. This award will be discontinued should the student change his/her program of study. Although this scholarship is based upon academic merit, students are strongly encouraged to complete the FAFSA each year.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES TRUSTEE SCHOLARSHIP
Each year the trustees of the College generously approve funding for a number of scholarships to be awarded on the basis of established need and academic achievement to new undergraduate and professional students. Undergraduate students must maintain a 2.5overall cumulative GPA for continued renewal of the scholarship. Professional students must maintain an overall cumulative GPA of 3.0 for continued renewal of the scholarship. Students must submit the FAFSA each year to determine eligibility for this scholarship.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES TRUSTEE PHARMACY SCHOLARSHIP
Each year the trustees of the College generously approve funding for a number of scholarships to be awarded to qualifying entering freshman on the basis of established need and academic achievement. Students must maintain a 2.5 overall cumulative GPA for continued renewal of the scholarship. In addition students who are new to the College who enroll through the Office of Pharmacy Admissions may be awarded a scholarship on the basis of established need and academic achievement. These students need to maintain a 3.0 overall cumulative GPA for continued renewal of the scholarship Students must submit the FAFSA each year to determine eligibility for this scholarship.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES TRUSTEE SCHOLARSHIP FOR BACHELOR'S DEGREE PROGRAMS
ACPHS offers need-based scholarships to qualified entering freshmen, upon admission to the College in the bachelor's degree programs, who exhibit honorable academic achievement in high school. The Trustee Scholarship for bachelor's degree programs is renewed for a maximum of three years, provided the student maintains a cumulative GPA of 2.3 or greater and continued enrollment in the bachelor's degree programs. This award will be discontinued should the student change his/her program of study. Students must complete the FAFSA each year for continued renewal of the award.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES NEW VISIONS SCHOLARSHIP
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College and based upon completion of the New Visions Program, offered through the Board of Cooperative Educational Services of New York State. The New Visions Scholarship is renewable for up to three years provided the student maintains an overall cumulative GPA of 2.7 or better. Recipients are also encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

Albany College of Pharmacy And Health Sciences Project Lead The Way Scholarship
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College and based upon participation in Project Lead the Way coursework in high school. This Scholarship is renewable for up to three years provided the student maintains an overall cumulative GPA of 2.7 or better. Recipients are also encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

Albany College of Pharmacy And Health Sciences Health Care Exposure Scholarship
ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College and based upon completion of a high school health science program, such as an Area Health Education Center program, who are nominated for the scholarship by the Office of Admissions. The Health Care Exposure Scholarship is renewable for up to three years provided the student maintains an overall cumulative GPA of 2.7 or better. Recipients are also encouraged to submit the FAFSA to determine eligibility for other sources of financial aid.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES PHI THETA KAPPA SCHOLARSHIP
ACPHS offers this merit scholarship to qualified transfer students upon verification of membership in the Phi Theta Kappa organization. Students must maintain a 3.0 overall cumulative GPA for continued renewal of this award.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES TRUSTEE GRANT
Each year the trustees of the College generously approve funding for a number of grants to be awarded on the basis of established need and academic achievement. Students must maintain standards of academic progress and required GPA for continued renewal of the grant. Students must submit the FAFSA each year to determine eligibility for this grant.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES LEGACY SCHOLARSHIPS
ACPHS offers limited scholarships to qualified entering freshman who have immediate family members currently attending or who are graduates of the College.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES ON-CAMPUS HOUSING GRANT
ACPHS offers housing grants to qualified entering freshmen who demonstrate exceptional financial need. Students must reside on-campus in dormitories owned by ACPHS for consecutive terms for continued renewal of the grant. Students must submit the FAFSA each year to determine eligibility for this grant.

Updated July 2018

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

NEW YORK AND VERMONT STATE SCHOLARSHIPS & GRANTS

The Higher Education Services Corporation administers the New York State programs of financial assistance to undergraduate students attending our Albany Campus. Questions concerning any of the programs described below may be addressed by contacting the Office of Financial Aid. Students may also contact HESC at (888) NYS-HESC or **www.hesc.ny.gov**

ELIGIBILITY

In order to receive payment under New York State financial assistance programs, students must:

- Be a legal resident of New York State for at least one year prior to the start of the term;
- Be a United States Citizen or eligible non-citizen
- Study at an approved postsecondary institution in New York State (NYS)
  Have graduated from high school in the United States, earned a high school equivalency diploma by passing a Test Assessing Secondary Completion (TASC) formally known as a GED, or passed a federally approved "Ability to Benefit" test as defined by the Commissioner of the State Education Department;
- Be enrolled as a full-time student taking 12 or more credits (applicable toward your degree program) per semester
- Be matriculated in an approved program of study and be in good academic standing with at least a "C" average as of the 4th semester payment;
- *Be enrolled as a full-time student taking twelve or more credits applicable toward the degree program, per semester to receive TAP;
- Be in compliance with the terms of any service condition imposed by a NYS award;
- Meet income requirement.
- Be charged at least $200 tuition per year
- Not be in default on any state or federal student loan or on any repayment of state awards

* Credit-bearing courses in the student's minimum full-time course load (12 semester hours or the equivalent) must consist of courses applicable to the student's program of study as a general education requirement, major requirement, or elective.

TABLE 2. PURSUIT OF PROGRAM REQUIREMENT FOR NEW YORK STATE AWARDS

In order to receive New York State awards, a student is required to receive a passing or failing grade (A-F letter grade) in a certain percentage of courses each term, depending upon the number of state award payments that a student has received. The percentage is determined according to the following schedule:

NUMBER OF PAYMENTS	MUST RECEIVE A GRADE FOR
1 or 2	50% of minimum full-time requirement (6 credit hours each semester)
3 or 4	75% of minimum full-time requirement (9 credit hours each semester)
5 or more	100% (12 credit hours each semester)

1. Pursuit of program: a requirement that the student complete a certain percentage of credits each term.

2. Satisfactory academic progress: a requirement that the student earns a specified number of credits and achieves a specified cumulative grade-point average each term. (See Table 1 and Table 3).

- Be free of debt from a defaulted guaranteed student loan. If the student previously has defaulted on a guaranteed student loan, he or she may reestablish eligibility for state financial aid through the Renewed Eligibility for Financial Aid program. Contact the Loans Division of HESC at (888) NYS-HESC for information regarding the REFA program.

NEW YORK STATE TUITION ASSISTANCE PROGRAM (TAP)

In the 2018-19 year, TAP will provide a tuition award from $500 to $5,165 per year. The award schedules are determined by the state legislature during the annual state budget process. The award is based upon the total of the NYS taxable income reported for the student, spouse and parent(s) on the 2015 NYS tax forms. The TAP award is not a loan and does not have to be repaid. To receive a TAP award as an undergraduate student, the total of the NYS taxable incomes of the student, spouse and parent(s) cannot exceed $80,000.

TAP APPLICATION PROCEDURES

The student must file the FAFSA by May 1 in order to receive a TAP award for the following academic year. HESC will use information provided on the FAFSA to generate a TAP award.

> ***ACPHS'S UNDERGRADUATE TAP CODE IS 0995.***
> This TAP code should be reported for the first four years of study in the Doctor of Pharmacy (PharmD) degree program and all years of study in the bachelor's degree programs.

Standard of Satisfactory Academic Progress for the Purpose of Determining Eligibility for State Student Aid

Program: Baccalaureate Program

Calendar: Semester

BEFORE BEING CERTIFIED FOR THIS PAYMENT									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
A STUDENT MUST HAVE ACCRUED AT LEAST THIS MANY CREDITS									
0	6	15	27	39	51	66	81	96	111
WITH AT LEAST THIS GRADE POINT AVERAGE									
0	1.5	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0

OTHER NYS SCHOLARSHIPS AND AWARDS

The availability of all New York State scholarship and award programs are subject to approval by the State Legislature each year. Additional information about these scholarships is available online at **www.hesc.ny.gov**

NYS SCHOLARSHIPS

- Flight 3407 Memorial Scholarship
- Flight 587 Memorial Scholarship
- Military Service Recognition Scholarship (MSRS)
- NYS Memorial Scholarships for Families of Deceased Firefighters, Volunteer Firefighters, Police Officers, Peace Officers, and Emergency Medical Service Workers
- NYS Scholarships for Academic Excellence
- NYS World Trade Center Memorial Scholarship
- NYS Achievement and Investment in Merit Scholarship (NY-AIMS)

NYS AWARDS

- NYS Aid to Native Americans
- NYS Regents Awards for Children of Deceased and Disabled Veterans
- Segal AmeriCorps Education Award
- Veterans Tuition Awards

VERMONT INCENTIVE GRANTS

Vermont residents accepted or enrolled in an undergraduate degree or certificate program who will be attending college full-time, and do not already have a bachelor's degree, are eligible to apply for a Vermont Incentive Grant.

The grant award amount is based on financial need and the cost of attendance of the student's school. The minimum and maximum award amounts are determined annually based on funding availability.

Vermont Incentive Grants may be used at schools either within Vermont or out-of-state. To apply, complete a Free Application for Student Aid (FAFSA) and a Vermont Grant Application. The Vermont Grant Application will be available electronically when submitting the FAFSA. Paper applications are also available at **www.vsac.org**.

Updated July, 2018

TUITION FEES AND EXPENSES

Below are the 2018-19 tuition and fees for Albany College of Pharmacy and Health Sciences. These amounts are approved annually by the College's Board of Trustees.

Tuition

Pre-Pharmacy and B.S. Programs [1]	$34,480
Professional Pharmacy Program, P1-P4 [2]	$39,920
Graduate (M.S.) Programs [3]	$1,330/credit hour

Student Housing (Albany)

Notre Dame or South Hall	$6,800
Holland/Princeton Suites - 2 Bedroom	$7,900
Holland/Princeton Suites - 4/5 Bedroom	$7,100
Resident Activity Fee	$40

Additional Fees

Meal Plan Albany [4]	$4,120
Meal Plan Vermont [7]	$770
Student Health Insurance Fee [5]	$2,112
International Student Fee	$200
Activity Fee - Full Time Students [6,7]	$350
Activity Fee - Part Time Students [6,7]	$99
Orientation Fee - First Year Students [6,7]	$350
Orientation Fee - Transfer and Vermont Students [6,7]	$250
Graduation Fee - For graduating students only	$100
Technology Fee - Full Time Students [6,7]	$275
Technology Fee - Part Time Students [6,7]	$125
Rotation Rescheduling Fee (per rescheduled rotation)	$250
Tablet Laptop Purchase (see below) [8]	N/A

Parking Permit Fees

Albany Commuter	$270
Albany Resident (9 month)	$350
6th Year Single Rotation (on campus)	$55
Vermont Student	$270

Footnotes:

1. Applies to the two pre-pharmacy years and all years of the B.S. programs. The pre-pharmacy and B.S. tuition is charged at a rate of $1,150 per credit hour on a part-time basis (11 credit hours or less). The fee for auditing is the same as that charged for part-time coursework.

2. P1 - P4 refers to the first, second, third, and fourth professional years of the Pharmacy Program. This is typically Years 1-4 for Vermont Campus students and Years 3-6 for students on the Albany Campus. The P1-P4 tuition is charged at a rate of $1,330 per credit hour on a part-time basis (11 credit hours or less). The fee for auditing is the same as that charged for part-time coursework.

3. Tuition is charged at a rate of $1,330 per credit hour for graduate courses. The maximum total per semester is $19,960 which applies to graduate students taking 15 or more credit hours. The fee for auditing is the same as that charged for part-time coursework.

4. Amount will vary based on choice of meal plan option. All students in Notre Dame and South Hall residence facilities are required to purchase the $4,120 Gold meal plan.

5. Assessed to all students unless proof of other insurance is provided by the August 1 deadline.

6. Non-refundable after the first day of classes.

7. Required for students.

8. All undergraduate students are required to have a laptop computer while enrolled at ACPHS.

IMMUNIZATION REQUIREMENTS FOR ATTENDANCE

Vaccine-preventable diseases are a major health concern on college campuses. Since immunization is widely regarded as one of the world's most effective tools for protecting public health, Albany College of Pharmacy and Health Sciences has established a pre-entrance Health Immunization Policy for all new incoming students. ***Failure to comply with health policies will result in an administrative HOLD on the student's record,*** which will block the student's ability to register, attend classes, or receive grades. Documentation of the following is required prior to registration for classes:

1. NYS Public Health Law 2165 requires post-secondary students to show immunity to **Measles, Mumps and Rubella** (2 doses of MMR, or equivalent for each disease, as outlined below - or documented physician-diagnosed disease is acceptable for Measles or Mumps.) Persons born prior to January 1, 1957 are exempt from this requirement.

2. NYS Public Health Law 2167 requires post-secondary institutions to distribute information about **meningococcal disease and vaccination** to students enrolled for at least six (6) semester hours (or the equivalent per semester), or parents/guardians of students under the age of 18. The institution is required to maintain a record of the following for each student:

    a. Certificate of Immunization for meningococcal meningitis disease within the last five (5) years; **or**
    b. A response to receipt of meningococcal meningitis disease and vaccine information signed by the student or the student's parent or guardian;
        AND, EITHER
    c. Self-reported or parent recall of meningococcal meningitis immunization within the past five (5) years; or
    d. An acknowledgement of meningococcal disease risks and refusal of meningococcal meningitis immunization signed by the student or student's parent or guardian.

3. **Varicella/Chicken Pox** – proof of vaccine series, positive (reactive) antibody titer or history of disease.

4. **Hepatitis B Vaccine** (traditional 3 doses, 2 doses of Recombivax or 4 accelerated doses of Twinrix)

ACCEPTABLE PROOF OF IMMUNITY:

MEASLES:

Students born on or after January 1, 1957 must submit proof of immunity to measles. One of the following is required:

- The student must submit proof of two doses of live measles vaccine: the first dose given no more than 4 days prior to the student's first birthday and the second at least 28 days after the first dose; **or**
- The student must submit serological proof of immunity to measles. This means the demonstration of measles antibodies through a blood test performed by an approved medical laboratory; **or**
- The student must submit a statement from the diagnosing physician, physician assistant or nurse practitioner that the student has had measles disease; **or**
- The student must submit proof of honorable discharge from the armed services within 10 years from the date of application to the institution. The proof of honorable discharge shall qualify as a certificate enabling a student to attend the institution pending actual receipt of immunization records from the armed services; **or**
- If a student is unable to access his/her immunization record from a health care provider or previous school, documentation that proves the student attended primary or secondary school in the United States after 1980 will be sufficient proof that the student received one dose of live measles vaccine. If this option is used, the second dose of measles vaccine must have been administered within one year of attendance at a post-secondary institution.

MUMPS:

- Students born on or after January 1, 1957 must submit proof of immunity to mumps. Only one of the following is required:
- The student must submit proof of one dose of live mumps vaccine given no more than 4 days prior to the student's first birthday; **or**
- The student must submit serological proof of immunity to mumps. This means the demonstration of mumps antibodies through a blood test performed by an approved medical laboratory; **or**
- The student must submit a statement from the diagnosing physician, physician assistant, or nurse practitioner that the student has had mumps disease; **or**
- The student must submit proof of honorable discharge from the armed services within 10 years from the date of application to the institution. The proof of honorable discharge shall qualify as a certificate enabling a student to attend the institution pending actual receipt of immunization records from the armed services.

RUBELLA:
Students born on or after January 1, 1957 must submit proof of immunity to rubella. Only one of the following is required:

- The student must submit proof of one dose of live rubella vaccine given no more than 4 days prior to the student's first birthday; **or**
- The student must submit serological proof of immunity to rubella. This means the demonstration of rubella antibodies through a blood test performed by an approved medical laboratory (Since rubella rashes resemble rashes of other diseases, it is impossible to diagnose reliably on clinical grounds alone. Serological evidence is the only permissible alternative to immunization.); **or**
- The student must submit proof of honorable discharge from the armed services within 10 years from the date of application to the institution. The proof of honorable discharge shall qualify as a certificate enabling a student to attend the institution pending actual receipt of immunization records from the armed services.

For more specific disease information regarding measles, mumps, rubella and meningococcal disease, refer to the New York State Department of Health website at http://www.health.state.ny.us/ or the Centers for Disease Control website at http://www.cdc.gov/.

OTHER IMMUNIZATIONS/HEALTH INFORMATION

ADVICE OF ELEVATED RISKS FOR CERTAIN INDIVIDUALS (LAB SAFETY) FORM

Conducting activities in a laboratory might put some persons at elevated risk sufficient to warrant their exclusion from the laboratory or other appropriate accommodation. Therefore, all new students are required to sign a form related to the risks of conducting laboratory activities.
If an individual feels that they may be at elevated risk, they should discuss the issue with their physician or a laboratory instructor to request an accommodation if needed. The form will be made available electronically to all new students.
Although not required, the following are strongly recommended:

TETANUS, DIPHTHERIA, PERTUSSIS (DTP) - within the last 10 years

TUBERCULOSIS (TB) SCREENING – All incoming students should complete a risk assessment questionnaire that will identify those who have not been at increased risk for exposure to TB. Students who have one or more identified risk factors for exposure to TB should have a tuberculin skin or blood test.

SEASONAL INFLUENZA VACCINATION: It is recommended that all students obtain an annual flu vaccination, dependent on national vaccine supply.

CYTOTECHNOLOGY PROGRAM CANDIDATES

A vision exam (including a color blindness test) is required for all Cytotechnology students. The exam needs to be signed and completed by a physician or ophthalmology technician**.**

IN PROCESS

A student is considered “in process” and allowed to attend classes if he/she has presented documentation that shows the student is in the process of completing the immunization requirements of PHL Section 2165. To be "in process" the student must have received at least one dose of live measles virus vaccine, have complied with the requirements for mumps and rubella, and have an appointment to return to a health practitioner for the second dose of measles if this appointment is scheduled no more than 90 days since administration of the first dose of measles virus vaccine.

A student can be considered in process of complying with PHL Section 2167 regarding meningococcal disease until a 30 day grace period has elapsed. The 30 day grace period may be extended to 60 days if a student can show a good faith effort to comply with PHL Section 2167. If a student is granted the extended grace period, then exclusion begins immediately after the 60 days elapses.

IMMUNIZATION DOCUMENTATION

Immunization documentation should be prepared by a physician, physician assistant or nurse practitioner, and shall specify the vaccines and give the dates of administration. It may also show physician-verified history of disease, laboratory evidence of immunity or medical exemption. This includes documents such as a certificate from a physician, a copy of the immunization portion of the cumulative health record from a prior school, a migrant health record, a union health record, a community health plan record, a signed immunization transfer card, a military dependent's "shot" record, the immunization portion of a passport, an immunization record card signed by a physician, physician assistant or nurse practitioner, or an immunization registry record.

EXEMPTIONS FROM IMMUNIZATION REQUIREMENTS

MEDICAL EXEMPTION

If a licensed physician, physician assistant, or nurse practitioner, or licensed midwife caring for a pregnant student certifies in writing that the student has a health condition which is a valid contraindication to receiving a specific vaccine, then a permanent or temporary (for resolvable conditions such as pregnancy) exemption may be granted. This statement must specify those immunizations which may be detrimental and the length of time they may be detrimental. Provisions need to be made to review records of temporarily exempted persons periodically to see if contraindications still exist. In the event of an outbreak, medically exempt individuals should be protected from exposure. This may include exclusion from classes or campus.

RELIGIOUS EXEMPTION

A student may be exempt from vaccination if, in the opinion of the institution, that student (or student's parent(s) or guardian of those less than 18 years old) holds genuine and sincere religious beliefs which are contrary to the practice of immunization. The student requesting exemption may or may not be a member of an established religious organization. Requests for exemptions must be written and signed by the student if 18 years of age or older, or parent(s), or guardian if under the age of 18. The institution may require supporting documents. It is not required that a religious exemption statement be notarized. In the event of an outbreak, religious exempt individuals should be protected from exposure. This may include exclusion from classes or campus.

NOTE: Rotation sites hosting experiential education students may deny a student's participation in the experiential program because of insufficient immunization documentation. If this is the case, the student would be scheduled for another similar rotation, based on availability.

EXCLUSION

"Exclusion" is the process whereby noncompliant students are not permitted continued attendance at the institution; whereas, "attendance" means the student's physical presence on campus (i.e., exclusion from classes, dorm residence and other curricular and extra-curricular campus activities). Exclusion should begin immediately after a 30 day grace period as stipulated under PHL Section 2165 (measles, mumps and rubella requirements), or after 45 days if a student is from out of state or from another country and can show a good faith effort to comply, or when a disease outbreak occurs.

For institutions to be in compliance with PHL Section 2167 (meningococcal meningitis response form), exclusion of students should begin immediately after the 30 day grace period elapses. The 30 day grace period may be extended to 60 days if a student can show a good faith effort to comply with PHL Section 2167. If a student is granted the extended grace period, then exclusion begins immediately after the 60 days elapse.

Academic Standards

Academic standards for all programs at ACPHS are developed and adopted by the faculty and are administered by the College administration.

College-wide academic standards apply to all ACPHS students. **Individual programs also have academic standards and policies that supersede the college-wide academic standards.** Two faculty committees are responsible for the oversight of academic standards and the academic standing of students; the Academic Standards Committee (ASC) handles the BS and the PharmD programs and the Graduate Academic Standards Committee (GASC) handles graduate (MS) programs. The committees are responsible for reviewing student academic records at the end of each semester and making recommendations regarding academic standing of students to the Dean of the School in which the student's program resides. At the end of the each semester, the Registrar's office prepares student grade reports from the current semester and provides the reports to the ASC (BS, PharmD) and the GASC (MS). Grade reports of all students on academic probation from the previous semesters are also provided to the respective committees. Grade reports are reviewed by the committees and the academic standing of a student is determined based on course completion, course grades, semester grade point average, cumulative grade point average and/or progress on the thesis or capstone project. Students are required to maintain minimum course grades, semester, cumulative and professional GPAs as required by the college-wide and programmatic academic standards to be in good academic standing. ASC/GASC makes recommendations on the academic standing of students in academic difficulty, i.e., who fail to meet academic standards, and on students eligible to be removed from probation to the Dean of the School. The Dean makes the final decision on the student's academic standing and communicates the decision to the student in writing.

College-Wide Academic Standards

Academic Standing

The academic standing of students is designated as one of the following at the end of each academic term: fall, spring, summer session I and summer session II.

Good Academic Standing

Students who have successfully completed all coursework with grades, semester and cumulative GPAs that meet or exceed the minimum college-wide and programmatic academic standards, and/or are making appropriate progress on thesis or capstone work are designated as being in good academic standing. Note that good academic standing does not assure progression into the professional years of the College's programs. Students are not officially informed of this status unless they are being removed from academic probation imposed in the previous semester.

Academic Probation

Students whose academic performance falls below the college-wide or program standards at the end of an academic semester will be placed on College-wide academic probation or program academic probation, respectively. A student on academic probation must improve academically and address the conditions that resulted in probation. While on academic probation, a student may be ineligible to hold a class and student organization office, join a fraternity, participate in intercollegiate athletics or provide service on College committees. In some cases, financial aid may be jeopardized. A student's academic probation period will end when the student successfully addresses all of the conditions that placed the student on probation. The summer semester can only be used to address course grades and cumulative GPA deficiencies, not the prior semester's GPA.

A student will be placed on college-wide academic probation if any of the following conditions exist within a semester:

- A semester or cumulative GPA below 2.0
- Two or more grades below C-
- A single grade of F

Program-specific standards may be found in subsequent sections of the catalog

Academic Dismissal

Students with significant or multiple academic deficiencies may be dismissed from an academic program (based on program-specific academic standards) or they may be dismissed from the College. Academic dismissal is usually not invoked until academic probation has been imposed. However, academic dismissal may be recommended before probation when a student's academic record is significantly deficient. Students who have been dismissed from a program, but not the College, may consider transfer to another program at the College. Students dismissed from the College can also seek re-admission to ACPHS as transfer students.

A student may be dismissed from the College if one of the following conditions exists:

- Two instances of probation (whether consecutive or non-consecutive)
- A semester GPA below 1.6

Program-specific standards may be found in subsequent sections of the catalog.

Student Conduct Suspension:
See Student Handbook

Student Conduct Expulsion:
See Student Handbook

Appeal of Academic Decisions

Students are permitted to appeal academic decisions (except academic probation) by submitting a letter of appeal to the Dean of Students. The basis for such appeals should involve cases of unusual or extenuating circumstances that directly impacted the student's ability to meet the college-wide or program academic standards. Appeal requests are considered by the Academic Standing Appeals Committee which makes a recommendation to the Deans of the Schools (currently Arts and Sciences, Pharmacy and Pharmaceutical Sciences, and Graduate Studies). The Deans of the Schools review the recommendation and notify the student of their decision in writing. Appeal letters should contain a statement referencing the original decision and an explanation addressing why it is being appealed. In the event that extenuating circumstances are identified, appropriate documentation supporting the assertion by a competent, qualified professional must be included when applicable. The College reserves the right to require further evaluation and/or documentation. Finally, the appeal letter should include plans for coping with any unresolved extenuating circumstances and for remediating any academic deficiencies. Appeals are heard on a rolling basis by the Academic Standing Appeals Committee. Adverse decisions from the Deans may be appealed to the Provost for a final determination. Deadlines for all appeals are five (5) business days from the time that the student notification was sent.

If the appeal is granted, students are provided with conditions of the appeal for the ensuing academic year from the academic Deans. Students must accept the conditions of the granted appeal.

Re-Admission Policy

A student who wishes to return to the College after dismissal for poor academic performance may apply for admission as a transfer student (See Transfer Student Policy). Courses taken at other institutions during the dismissal period will be reviewed for approval as transfer credits upon re-admission to the College.

Grades and Grade Point Average (GPA)

Faculty are responsible for assigning grades in each course. In the event of an unresolved conflict between an instructor and a student over a course grade, the student should refer to the "Course Concerns" policy found in this catalog. Numerical grades, letter grades and grade point equivalents are listed in the table below.

- At the discretion of the instructor, a grade of "I" (Incomplete) may be assigned when a student does not complete the requirements of a course within the semester of enrollment due to extenuating circumstances. Instructors may request that a grade of I be assigned to a student using the Incomplete Grade Request Form found on the Registrar's intranet site. Unless the faculty member submits a final grade, the Registrar's Office will change an incomplete grade to the grade indicated on the request form when the deadline established by the faculty (no longer than one semester) has passed. An incomplete grade does not satisfy the prerequisite of another course. Students cannot graduate from the college with an incomplete grade on their record.
- Some courses are graded on a pass/fail basis. Grades of "P" are not calculated into the GPA.
- Earned quality points for each course are calculated by multiplying the number of credits for that course by the GP equivalent. For example, a student taking Physiology/Pathophysiology I (4 credit course) receiving a grade of B+ (GP=3.3) would earn 13.2 quality points (4 credits x 3.3 GP=13.2). The total (semester, cumulative, or professional) quality points earned is determined by adding the quality points of

all courses. To determine academic standing, GPAs are rounded to the nearest tenth of a point (0.1). Semester, cumulative and professional GPAs are calculated by dividing the total quality points earned by the total credits. See additional information regarding calculation of GPA under section Course Repeat and Remediation

Course Withdrawal

- Students are allowed to Drop a course within the first week of the semester without the course appearing on the transcript.
- From the end of week 1 to the end of week 9 (or until 60% of the course is completed), students are allowed to withdraw from a course only with permission of the course instructor and the grade of a "W" will be recorded on the transcript.
- Students are allowed to withdraw from a course after the ninth week of the semester (or 60% of the course is complete) only as a result of a program change or for extenuating circumstances such as a medical situation or family emergency. In this circumstance, students must obtain the permission of the Dean of the School in which the student's program resides. At the discretion of the Academic Dean of the School, a grade of "W" may be assigned or the course instructor may be asked to assign a grade. Grades of "W" are not calculated into the GPA.

Numerical Grades, Letter Grades, and Grade Point Equivalents *

Numerical Grade	Letter Grade	GP Equivalent
> 97	A+	4.0
93-96	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
< 60	F	0.0

The above numerical equivalents are provided as a guideline to faculty and students. Please consult individual course syllabi for course grading and rounding policies.

Criminal Background Checks

For those ACPHS degree programs that require the completion of College-supervised experiential education rotations, specific rotation sites may require a student to provide a background check prior to commencement of their rotation at that site. In such cases, ACPHS will provide appropriate instructions for students to begin a background check, and ACPHS will cover the cost of the check. Rotation sites hosting experiential education students may deny a student's participation in the experiential program because of a negative finding, which could result in delayed graduation or in the inability to graduate from the program. Nothing contained in this policy shall limit or supersede the College's provisions, processes or penalties established pursuant to the Student Disciplinary Code.

Program Academic Standards – Bachelor and Pre-Pharmacy

Bachelor of Science and Pre-Pharmacy Programs

Students in all BS programs and those in the early assurance pre-pharmacy program must attain and maintain the college standard of semester and cumulative GPA of 2.0 in the first two years of the curriculum to remain in good academic standing. Note that good academic standing does not ensure entry into the College's professional programs.

Progression Requirements for BS in Clinical Laboratory Sciences Program

Clinical Students in the CLS program must attain and maintain the college standard of semester and cumulative GPA of 2.0 in the first two years of the curriculum. Starting in year three (the first professional year), students are subject to both College-wide standards and the CLS specific standards below.

Students must maintain a semester and cumulative professional GPA of 3.0.

- Professional courses are defined as those required courses bearing a CLS prefix. The professional GPA is calculated based on the grades from all professional courses taken.
- All students whose semester or cumulative professional GPA drops below 3.0 will be placed on program probation. Two program probations may result in dismissal from the program.
- Professional courses with a grade below C (73%) must be repeated.

In order to begin clinical practicum rotations students must have:

- Passed all required courses numbered 399 and lower.
- Completed all professional courses numbered 399 and lower with a grade of C or better. All grades below C must be repeated.
- Have a professional GPA of 3.0.

Clinical rotations are considered professional courses and must be completed with a C or better. Any rotation below C must be repeated. One grade of F results in program probation; two grades of F may result in dismissal from the program.

Program Academic Standards - Master of Science Programs

Academic Standing

To be in good academic standing, graduate students must have a cumulative GPA of 3.0 or higher, must earn a grade of B or better in all required courses , and have no more than one grade of less than B in elective courses. Graduate students must also demonstrate satisfactory progress in thesis research, capstone or clinical practicum as documented by recommendations from the thesis/academic advisor and the grades of related thesis courses to be considered in good academic standing.

Academic Probation

A graduate student will be placed on academic probation for any of the following reasons.

- semester GPA falls below 3.0
- receives a grade of B- or below in any required or elective course; or
- unsatisfactory progress towards completion of thesis research or capstone project .

A recommendation for academic probation due to unsatisfactory progress in thesis research or capstone project may be initiated by the student's advisor if the advisor considers a student's performance to be unsatisfactory irrespective of a student's grade point average. Recommendations for probation are made to the Dean of the School of Graduate Studies. The Dean forwards the recommendation to the Graduate Academic Standards Committee and the committee, makes a recommendation to the Dean, who makes the final decision regarding probation. Students placed on academic probation will be informed by the office of the Dean of the School of Graduate Studies. Probationary status regarding graduate students will be communicated to the student's academic advisor, the Program Director, the Dean of Students and the Registrar's office by the Dean of the School of Graduate Studies.

Removal from Academic Probation

A graduate student placed on academic probation due to a semester GPA below 3.0 must restore their cumulative GPA to 3.0 or above within two semesters for full-time students, or 12 credit hours for part-time students, to be removed from probation. Students receiving grades of B- or below in a required or elective course must remediate the course in order to be removed from academic probation. Students placed on academic probation due to unsatisfactory progress towards completion of the degree may be restored to good academic standing following notification by the advisor or Program Director to the Dean of the School of Graduate Studies that the student is making satisfactory progress. Such notification must be received within two regular academic semesters. A student who is not restored to good academic standing by end of the specified time or credit hour requirement may be dismissed from the program. Students removed from academic probation will be informed by the Dean of the School of Graduate Studies

Academic Dismissal

A graduate student may be dismissed from a graduate program for any of the following reasons:

- Failure to correct deficiencies of academic probation in a timely manner (see above: "*Removal from Academic Probation*")
- Two independent instances of being placed on academic probation.
- Two failures of the thesis defense or two failures of the capstone project.
- Receiving a grade of F in any required graduate course or grades of B- or below in two or more required courses.

- Failure to meet Programmatic requirements in the time frame designation for program completion. Full-time graduate students must complete all graduate program degree requirements in 3 years or less. Part-time graduate students must complete all MS degree requirements in 7 years or less.

Students dismissed from a graduate program will be informed by the Dean of the School of Graduate Studies and the decision will be communicated to the student's advisor, the Program Director, Dean of Students and the Registrar's office

Program Progression Standards - Doctor of Pharmacy Program

Progression of Early Assurance Pre-Pharmacy Students into the P1 Year

Students enrolled in the early assurance pre-pharmacy program automatically progress into the P1 year of the PharmD program if the following conditions are met:

- In good academic standing
- Completion of the pre-pharmacy program with a cumulative overall GPA of 3.0 or higher.
- Completion of all required courses in the pre-pharmacy curriculum plus meeting elective requirements. Students entering P1 require a minimum of 9 elective credits, at least 6 of which must be liberal arts credits. Liberal arts credit requirements may be met by courses in history, civilizations, fine arts, literature, philosophy, religious studies, ethics, foreign language, cultural diversity, performing arts or visual arts.
- No un-remediated course failures.
- Successfully completed the writing proficiency assessment.
- Successful completion of an in-person interview, to take place during the 2nd pre-pharmacy year. The interview will include a face-to-face conversation with two faculty or staff members of the College. Only students who attain a GPA $\geq$ 2.5 (after three semesters, or after the fall semester of pre-pharmacy year 2) will be invited for interview.
- Self-reporting of conduct or academic integrity issues and successful completion, at the student's expense, of a criminal background check.

Review of Non-Progressing Early Assurance Students by the Pharmacy Admissions Committee (PAC)

The academic records of early assurance students not meeting the course or GPA requirements for automatic progression into the P1 year, outlined above, but who have met all of the other criteria are reviewed by the PAC in May for consideration to progress into the P1 year of the PharmD program. For consideration by the committee, students must have a minimum cumulative GPA of 2.5 or higher. Typically, students considered will have taken the PCAT exam and completed all required courses in the pre-pharmacy curriculum.

The committee reviews applications for special progression consideration. The committee may recommend one or more of the following conditions for progressing into the P1 year:

- Remediate one or more courses during the summer months prior to entering the P1 year. Students may be required to earn minimum grades in remediated courses or to take courses at ACPHS when available.
- Take or re-take the PCAT exam.

The committee makes a recommendation to the Dean of the School of Pharmacy and Pharmaceutical Sciences, who makes the final decision and informs the student of the progression decision. Note that meeting the minimum requirements for this review does not guarantee progression into the P1 year.

Students in good academic standing at the College who do not progress into the P1 year by any of the mechanisms above may apply for transfer to another program at the College. See the process for program transfer below.

Appeal of the Progression Decision

ACPHS students who have failed to meet all progression requirements *due to extenuating circumstances* may submit a letter of appeal for an extension of one year to repeat course work in the pre-pharmacy curriculum. See the section entitled "Appeal of Academic Decisions" for the process.

If the appeal is granted, the student remains in the pre-pharmacy program during the remediation year and reapplies for admission to the P1 year. Students must accept the planned course of study for the appeal to be granted. A student will not be allowed to progress (or be admitted into P1) if progression requirements have not been met at the end of the remediated year. The Pharmacy Admissions Committee will re-evaluate the student after the one year period to determine if the student has successfully met the requirements for progression into the P1 year. Students who fail to meet the progression requirements after this one year extension, who are in good academic standing at the College, may apply for transfer to another program at the College. See the process for program transfer below.

Student Conduct and Academic Integrity Issues

Students progressing into P1 are required to self-report any conduct or academic integrity issues. The College also requires that all students, at the student's expense, provide a background check prior to entry into the P1 year. Negative findings contained within the self-report or background check will be reviewed by a Background Check Committee appointed by the Provost, to determine if the finding prevents the student's admission, progression, or ability to successfully complete experiential rotations. Negative findings may affect student progression but will not *automatically* disqualify a student from matriculation or continued enrollment. The committee reviews the report and makes a recommendation on admission/progression to the P1 year of the PharmD program to the Dean of the School of Pharmacy and Pharmaceutical Sciences, who makes the final decision. The student may appeal the decision to the Provost within five (5) business days of the receipt of electronic notification of the decision.

Program Academic Standards – Doctor of Pharmacy Program

Professional Courses and Professional GPA

Professional courses are defined as all required courses in the P1-P4 years of the Doctor of Pharmacy Program, including professional electives, regardless of whether taken during the P1 – P4 years or earlier. The professional GPA is determined using grades earned in all professional courses. Professional courses with grades below C- must be repeated.

Academic Probation

A student will be placed on academic probation if any of the following conditions exist:

- In the four-year program, a cumulative professional GPA below the thresholds listed in the table below, by semester.

End of Fall P1	2.0	End of Spring P1	2.1
End of Fall P2	2.1	End of Spring P2	2.2
End of Fall P3	2.2	End of Spring P3	2.3
End of Fall P4	2.3	To Graduate Spring P4	2.5

- In the accelerated PharmD (AP) three-year program (AP1-AP3), a cumulative professional GPA below the thresholds listed in the table below, by semester.

End of Summer AP1	2.0		
End of Fall AP1	2.1	End of Spring AP1	2.1
End of Fall AP2	2.2	End of Spring AP2	2.3
End of Fall AP3	2.3	End of Spring AP3	2.5

- Any grade point average (GPA) below 2.0 (semester, professional semester);
- A single grade below C-.

Academic Dismissal

A student may be dismissed from the program for any of the following reasons below:

- Two instances of probation (whether consecutive or non-consecutive) resulting from coursework in the Doctor of Pharmacy program
- A semester GPA below 1.6
- Two introductory or advanced pharmacy practice experience (IPPE/APPE) grades of F

Prior probations are not considered when evaluating a student for dismissal during the experiential component.

Progression in Experiential Education

Students in the PharmD program are required to complete two types of experiential education rotations, Introductory Pharmacy Practice Experience (IPPE) and Advanced Pharmacy Practice Experience (APPE).

- For the IPPE 1 rotations: Students who complete P1 and are in good academic standing are allowed to progress into their community IPPE. Students who are not in good academic standing (those on probation) will use the summer and ensuing months to repeat coursework to attain good academic standing. Once good academic standing is achieved, students are eligible to complete their community IPPE, as scheduled by Experiential Education, either later in the summer following P1, or in the summer following P2.

- For the IPPE 2 rotations: Students who complete P2 in good academic standing are allowed to progress into their institutional and team-based care IPPEs. Students who are not in good academic standing will use the summer and ensuing months to repeat coursework to attain good academic standing. Once good academic standing is achieved, students are eligible to complete their institutional and team-based care IPPEs, as scheduled by Experiential Education, either later in the summer following P2, or in the summer following P3, typically scheduled during Module A of the APPE calendar. All IPPEs must be successfully completed prior to beginning APPEs.

- For the APPE rotations: Students must complete the entire pre APPE curriculum, including IPPEs and be in Good Academic Standing before entering the APPE. Students on probation will not be permitted to begin APPE. Once probationary status is removed from the student and good academic standing is attained, Experiential Education will schedule the appropriate APPE as schedules permit.

Academic Policies

Attendance Policies

Students are expected to attend all assigned classes. Students who have documented absences which exceed 10 percent of the total number of scheduled instructional hours for any given course may, at the discretion of the instructor, receive a grade of I or F and/or be refused admission to the final examination. Courses may have attendance policies listed in their syllabus that supersede this policy. The College expects instructors to be reasonable in accommodating students whose absence from class resulted from:

- personal illness; or
- family bereavement or
- observance of major religious holidays or other compelling circumstances

For all short-term absences such as one-day sickness or car troubles, etc., students are expected to communicate directly with their faculty to inquire about processes for any missed coursework. Instructors and the College have the right to request documentation verifying the basis of any absences resulting from the above factors.

Long-Term Absences

Students may request up to a one-year leave of absence (i.e., current and subsequent semester) or within a semester leave (e.g., several days to a few weeks) from the College for long-term medical or other extenuating personal reasons which prevent the student from completing the semester. A student requesting a leave of absence from the College is required to provide written notice to the Dean of Students. For leave, the request must state the reason(s) for the leave, the duration desired and supporting documentation.

In some cases, the Dean may request to meet in person with the student. The Dean of Students makes a decision on the request and communicates the decision to the student within one week of receipt of the request, and disseminates approved leave decisions to the student's faculty, faculty advisor, program director and the Dean of the School in which the student's program resides.

Absences Due to Athletic Events

Recognizing that regular class attendance and on-time participation in classroom assessments (i.e. exams) are critical to the success of student athletes, it is expected that athletic competition schedules will be created in a way that minimizes student absence from class and regularly scheduled class activities. Student athletes are likewise expected to arrange their class schedules in a way that minimizes conflicts between class and contests. When conflicts between class and competitions (not practices) are unavoidable and/or are due to scheduling beyond ACPHS control, faculty should treat the absence as excused and provide reasonable accommodation for the student athletes as indicated in their course syllabus. On the rare occasion that accommodations are not possible, or where there is a compelling academic reason, a faculty member may deny that student athlete accommodation. If denied accommodation, the student can appeal to the Dean of the School in which the course is housed to determine the possibility of providing accommodations.

Academic Policies

Class Cancellations

Faculty shall hold classes as scheduled in accordance with college regulations. Faculty absences caused by illness, personal responsibilities such as jury duty, professional obligations such as attendance at scholarly meetings or occasional professional service are excusable, but must be reported to the Department Chair in advance and alternate measures must be identified so that the class schedule is not interrupted. For hybrid/blended courses or courses with synchronous online components, faculty may alter the delivery method in lieu of cancelling a regularly scheduled face-to-face or synchronous class session.

On rare occasions, instructors may be delayed or unable to attend a class due to emergency circumstances. In the event that an instructor does not appear in class and has not notified class of his/her expected arrival time, the class for that day is cancelled after 15 minutes of the scheduled start of that class, but must be rescheduled as soon as possible or alternative measures taken by the same instructor or an alternate faculty member.

Instructional Contact Hours

Federal regulations state institutions of higher education must have 14 weeks of instruction with one week of exams. Should a class not require a final exam, a final project or out-of-class activity should be assigned. Regulations for academic credit require a specific number of hours for each credit. Presuming that they require preparation prior to the lab session, laboratory courses are expected to have no fewer than 12 meetings per semester.

Course Concerns Policy

Students are encouraged to discuss concerns about grading and other academic issues with faculty according to the following sequence:

1. The first step is a discussion with the faculty member teaching the course or section of the course, in collaboration with the course coordinator, where applicable. The process must be initiated within two weeks of the examination, assignment or academic incident that is the subject of the appeal.
2. If the concern is not resolved satisfactorily through discussion with the faculty member, the student should consult the course coordinator.
3. In the event that a mutually acceptable resolution is not achieved with the course coordinator, the student may appeal in writing to the department chair.
4. If the issue is still unresolved at this stage, the final step in the process is to submit a written appeal, including any supporting documents, to the Dean of the School in which the course is offered. The decision of the Dean is final.

Academic Policies

Course Repeat and Remediation

Course Repeat: In some instances, students are allowed or required to repeat an entire course.

- Any grade of "F" must be repeated if the course is required for a student's degree.
- Students may repeat a course with permission of their advisor and course instructor by completing the "course permission form" (see Registrar's page on the Intranet for form). If a repeated course is completed at an institution other than ACPHS, it must be completed with a *higher grade* than the original course grade in order to have the credits transferred back to the College (minimum transferrable grade is a "C").
- Students will not be allowed to repeat a course during the academic year (fall or spring semester) at another institution if the same course is offered at ACPHS and will fit within the student's required course schedule. If the required course is not available at ACPHS, students may be allowed to repeat the course at another accredited institution and must be pre-approved according to the course permission policy found on the Registrar's intranet site.
- When repeating a required or elective course, a record of both courses will remain on the official transcript. If both courses are completed at ACPHS, the higher of the two course grades will be used in the calculation of the cumulative GPA. If the repeated course is completed elsewhere with a grade of C or better, neither the original nor the repeated course grade will be used in GPA calculations. The cumulative GPA will be updated after completion of the term after which the course was repeated.
- Independent study cannot be used for the purpose of repeating a course.
- A student's progression through the program may be delayed as a result of the required course repeat.

Course Remediation: In some instances, students are allowed or required to remediate a portion of a course. Course remediation may occur either during the course (within-course remediation) or after a course is completed (post-course remediation).

- Course coordinators have the authority to permit or not to permit remediation of course elements. It is the course coordinator's responsibility to determine what is permissible for remediation and it is expected that this will vary by course.
- If a course permits remediation, the syllabus must include a list of the course elements that may be remediated, the process by which remediation occurs, the criteria for what is permissible for remediation (i.e., a grade below a certain threshold on a course element) and the policy for calculating the final grade to include the remediated elements.
- All course remediation (within- and post-course) must be completed within two weeks of final grade submission to the Registrar, or for the fall semester, one week prior to the spring semester. Once remediation is complete, the course coordinator may request a grade change for the course in question. The original course grade will not show on the student's transcript or be included in the GPA calculations.
- In the case of post-course remediation, the final grade earned in the term of the course must be submitted to the Registrar at the close of the semester. Submission of a grade of incomplete is not acceptable. The Academic Standards Committee will review all grades and make recommendations based on the submitted grade. If the grade after the remediation process changes the academic status of the student from a probation or dismissal category, the Academic Standards Committee will review the revised grades and will, if necessary amend recommendations to the Dean.

Academic Policies

Doctor of Pharmacy Program: Repeat of Deficient Professional Coursework

Students in the professional years of the PharmD program (P1-P4) may repeat courses, preferentially at ACPHS, or may do so at another accredited professional level school if the course is pre-approved by the course coordinator and department chair (See registrar's website for approval form). Students must earn a grade of C or better in courses repeated at other institutions. When repeating a required or elective course, a record of both courses will remain on the official transcript. If both courses are completed at ACPHS, the higher of the two course grades will be used in the calculation of the GPA. If the repeated course is completed elsewhere with a grade of C or better, neither the original nor the repeated course grade will be used in GPA calculations. The cumulative GPA will be updated during the term the course was repeated. A student's progression through the program may be delayed as a result of the required course repeat.

Transfer Credit

At the time of admission to an ACPHS program, new, incoming students in B.S.programs (freshman or transfer) may request transfer of academic credit from Advanced Placement (AP) courses, International Baccalaureate (IB) or CLEP exams, or undergraduate college courses taken at another US accredited academic institution. The evaluation of academic credit for new freshman or transfer students in B.S. programs is coordinated by the Office of Admissions (Enrollment Management) and Registrar*. (Students entering the P1 year of the PharmD program have academic credit awarded based on coordinated evaluation between the Office of Admissions and the Pharmacy Admissions Committee.

- To receive credit for AP courses, scores of 4 or 5 are required.
- To receive credit for IB courses, scores of 5 or above are required.
- To receive credit for the College Level Examination Program (CLEP) examination, a score of 70 or better must be achieved. CLEP credits will only be accepted for elective classes.
- Grades of C or better are required to receive credit for college courses taken at another regionally accredited academic institution. Up to 68 credits may be transferred from another institution. Decisions made regarding acceptance of transfer credit are final once the semester begins*. For a listing of institutions where transfer credit has been accepted previously, please contact the Registrar's office.

Taking Courses at Other Academic Institutions:

Upon matriculation, students are strongly recommended to take all required "core" or program-specific coursework at ACPHS. Program Directors may identify specific courses which must be taken at ACPHS, regardless of matriculation date. See specific program guidelines at https://www.acphs.edu/academics/bachelors-programs. Students wishing to take required courses during an academic term where the course is not offered at ACPHS may take that course at another institution, upon receiving approval from the Department Chair or other designee in which the student's program resides (e.g Program Director).

- A maximum of 10 semester hours of coursework may be taken at institutions other than ACPHS.
- ACPHS students are allowed to take courses during the summer as long as doing so meets the General Academic Requirements and Course Repeat policies.
- Grades from credits transferred to ACPHS as part of a joint degree program (through an affiliation agreement) will be counted towards a students' GPA at ACPHS.
-

* Exceptions to these procedures may be made on a specific, case-by-case basis for individual students by their Program Director with consultation with the appropriate Department Chair.
* Denotes that specific procedures for implementation will be developed following policy approval.

Academic Policies

Graduate Level Course Transfer

Up to nine (9) credit hours of graduate level coursework may be transferred to ACPHS from other accredited academic institutions, subject to the approval of the Program Director and the Dean of the School of Graduate Studies. To be considered for transfer credit, courses must have been taken in the past seven (7) years. Only courses where applicants have earned grades of B (83; B- is not accepted) or higher will be considered for transfer credit. Courses graded on a pass/fail basis will not be accepted for transfer credit. A request for awarding of transfer credit along with official transcripts of the coursework must be submitted to the School of Graduate Studies, at least one month prior to the start of the graduate program at ACPHS for consideration of transfer credit. The request will be reviewed by the Program Director and faculty with expertise in the course area, and they will make a recommendation to the Dean regarding the request. The Dean will make the final decision and inform the student, Program Director and the Registrar's office.

Pre-Requisites and Transfer of College Course Credit for PharmD Students

Students entering the P1 year of the PharmD program are required to complete all of the required pre-requisite coursework prior to enrolling. In almost all cases, coursework required for entry into the P1 year must be completed by May 31 preceding P1 entry. In select cases, per the permission of the Pharmacy Admissions Committee (PAC), a student may be granted an allowance to take a specific course/s over the summer preceding P1, and granted a conditional acceptance into P1 pending the outcome of the summer course.

New students accepted to the P1 year of the PharmD program are required to take all required courses in the P1-P4 years of the program at the College. However, students with academic credit for biochemistry, molecular biology and/or immunology courses taken at other accredited academic institutions may request transfer of credit for these courses at the time of admission to the program if the following criteria are met:

- Academic credit for the course was earned within the last three years from an accredited academic institution;
- A grade of C or better was earned in the course;
- The course is a 300-level (third year) course.

Students submit a request for course credit transfer in writing to the Office of Admissions, along with the course description and syllabus from the academic institution where course credit was earned. If the specific course has been previously reviewed by ACPHS within three years, the Office of Admissions will inform the student of that determination. If the course has not been reviewed within three years, the Office of Admissions forwards the course description and syllabus to the faculty members responsible for the course on both campuses. The faculty jointly review and evaluate the course description and syllabus. The faculty members provide a written determination regarding whether the course should be considered equivalent to the ACPHS course. If the course is considered equivalent, the student will be provided credit for the course. The Office of Admissions sends all decisions on course credit transfer requests directly to the student in writing, pending receipt of final grades for courses for which a transfer is requested and informs the Registrar of the credit transfer.

Academic Policies

Summer Session Courses

ACPHS students are allowed to take courses during the summer as long as doing so meets the General Academic Requirements, Course Repeat and transfer policies. A maximum of 10 semester hours of coursework is allowed during any summer at institutions other than ACPHS.

Academic Minors

An academic minor is offered by a department. It is a defined program which reflects a coherent body of knowledge in one or more disciplines. A minor requires 18 to 24 credit hours of coursework. Unless listed otherwise in the description of the specific minor, the following apply to all minors.

- At least half of the required credits for the minor must be at an advanced level (300 level or above) as defined by the minor.
- Course work for an academic minor is presented with the same intellectual rigor as that expected of courses which fulfill requirements of a major. To successfully complete an academic minor, a cumulative minimum GPA of 2.0 must be achieved in courses required for the minor.
- A maximum of 12 credits of required courses for the student's degree program may also be used to satisfy the requirements of the minor (for example, PharmD students can count microbiology and immunology toward both their PharmD degree and the Microbiology minor). When the completion of a track is required for a degree program, specific courses that must be taken as part of that track are considered required courses (for example, since a microbiology student completing the infectious disease epidemiology track must take epidemiology as a requirement of the track, it is considered as a course required for the degree program).
- Students can utilize any number of free electives, bioselectives, science selectives, directed electives, professional electives, or track electives to complete the requirements for a minor.
- A student may not minor in a subject area in which that student is also completing a major.
- A minor cannot be completed after graduation.
- One course (3 to 4 credits) required for the minor may be taken outside of ACPHS with approval from the chair of the department which houses the minor.
- All courses for the minor must be taken for a grade unless P/F is the only option.

Waiving Course Prerequisites

Waiving the prerequisite requirement(s) can only be granted if a written/electronic approval from the course coordinator is received by the Registrar office. Satisfying pre-requisites using similar courses from other academic institutions must receive prior approval of ACPHS course coordinator.

Withdrawing from the College

A student who is withdrawing from the College must complete the College Withdrawal Form (found on the Register's Intranet page) and submit it to Registrar@acphs.edu. Students who withdraw from the College prior to the end of week 9, will receive grades of "W" for all registered courses in that semester. After week 9 of the semester, students who wish to withdraw from the College must meet with the Dean of the School in which the student's program resides. At the discretion of the Academic Dean of the School, a grade of "W" may be assigned to courses or course instructors may be asked to assign a grade.

Academic Policies

Policy for Internal Program Transfer

A student currently enrolled at ACPHS may apply for transfer from one academic program to another. An application form is available from the Program Director, the Registrar's office, or on the ACPHS Intranet at https://intranet.acphs.edu Academics tab/Registrar. The Program Director or Dean will review applications and render a decision to grant the transfer request based upon the student's academic status, academic record and the feasibility of the student to enroll in courses required for the program requested. The review will consider the schedule of course offerings and the student's record of completed courses. The timeframe for completion of all program requirements will be dependent on the student's record of completed coursework at the time of the program transfer. It should be noted that the granting of the transfer request may require additional time to satisfy all new program requirements. Students wishing to transfer into the professional years (P1 or P2) of the Doctor of Pharmacy program are required to apply through PharmCAS, Pharmacy College Application Service, at www.PharmCAS.org.

Transfer requests are considered at the end of an academic term and the approved change of program will be effective for the next academic term.

Dean's List

Dean's List standing is given to full-time students (excluding those in MS programs and those in the fourth professional year of the PharmD program) who have a semester GPA of 3.5 or greater, provided there are no other deficiencies. Students in the fourth professional year of the pharmacy program will be eligible to earn recognition in the form of Experiential Honors (see below) in place of Dean's List recognition. Dean's List students are informed and recognized for this honor at the end of each academic semester by the Dean of the School.

Requirements for Graduation

Candidates for all degrees must have satisfied all of the academic requirements of the program and be approved for conferral of the degree by a majority vote of the faculty. Students must pay all College-related financial obligations and return all material belonging to the College in order to be eligible for graduation. The College reserves the right to change the requirements for graduation.

Master of Science Programs: Requirements for Graduation

Students in any MS program must earn a minimum cumulative GPA of 3.0 to be eligible for graduation.

Doctor of Pharmacy Program: Requirements for Graduation

Students in the PharmD program must earn a cumulative professional GPA of 2.5 or better at the end of P4 to be eligible for graduation.

Academic Policies

Graduation Academic Honors

Undergraduates

In recognition of distinguished academic achievement, the College awards graduation honors to undergraduate students based on the cumulative GPA calculated from didactic coursework taken at ACPHS at the time of graduation.

Summa Cum Laude	3.9 – 4.0
Magna Cum Laude	3.7 – 3.8
Cum Laude	3.5 – 3.6

Doctor of Pharmacy

In recognition of distinguished academic achievement, the College awards graduation honors to PharmD students based on the cumulative GPA calculated from required professional coursework and professional electives completed during the professional years of P1 to P3 at ACPHS.

Summa Cum Laude	3.9 – 4.0
Magna Cum Laude	3.7 – 3.8
Cum Laude	3.5 – 3.6

Doctor of Pharmacy Program: Experiential Honors

10% of the graduating class will be honored at commencement for exemplary performance on experiential rotations. Preceptors will nominate students for this honor, and honorees are selected by the Division of Experiential Education.

Exceptions to Academic Policies:

ACPHS has established its College-wide academic policies to maintain the quality of our educational programs and to ensure that all students are treated equitably. On the rare occasion that an exception to these policies is warranted, permission for the exception may be granted by the Dean of the School offering the program in which the student is enrolled. It is expected that the student will consult with the appropriate individuals (i.e., academic or faculty advisor, registrar, program director, department chair) prior to petitioning the Dean.

Updated for Spring 2019 semester

STUDENTS ON CLINICAL ROTATION

Clinical rotations are designed to build on students' academic base and provide them with a wide exposure to various pharmacy practice/clinical laboratory experience in order for students to further develop skills in making independent judgments and integrating fundamental knowledge into clinical applications. The following is required for all students who will be participating in a clinical rotation as part of their college degree. Documentation must be provided to the Office of Experiential Education annually, prior to starting the supervised clinical experience.

ALL students who will be participating in clinical rotations must have the documentation below (TB screening, PE, and seasonal influenza vaccination) completed within a specific timeframe prior to the end of the academic year preceding the start of rotations (timeframe will be communicated to students at an appropriate time during the academic year.) PharmD candidates will need to complete this documentation annually starting with the end of the first professional year (P1) through the end of the 3rd professional year (P3). Clinical Lab Sciences and Cytotechnology students will only need to complete the documentation once at the end of the academic year prior to starting rotations. The dates MUST be adhered to in order to ensure the documentation remains in effect through the duration of the ensuing rotation year (TB screening and physical exam information must be current within one (1) calendar year of the rotation end date.)

TUBERCULOSIS (TB) INFECTION SCREENING (TUBERCULIN SKIN TEST [TST]/MANTOUX or IGRA):

- If your TB screening result is **positive**, you must receive a chest x-ray and provide the College with documentation of both the screening results and the x-ray report, as well as any follow-up treatment you receive.

- If you have had a **positive** TB screening in the **past,** you need to provide a copy of those results, along with a copy of a negative chest x-ray report, and any follow-up treatment you received.

- Those excluded from TB screening due to prior positive reaction or past disease must be evaluated during their annual physical exam for active signs of the disease.

PHYSICAL EXAM: An annual physical exam, valid for a 12 month period, is required.

SEASONAL INFLUENZA VACCINATION: A seasonal flu vaccination is required annually in the Fall (vaccinations are typically available starting in August each season) for all Clinical Lab Sciences students, Cytotechnology students and students in their professional years of the PharmD curriculum.

Academic Policies

NON-MATRICULATED (NON DEGREE SEEKING) STUDENT POLICY

Non-matriculated status permits students to take courses to explore degree options, for personal enrichment, professional development, or fulfilling degree requirements for another institution, which would include cross-registration. Non-matriculated status is reserved for students who are not seeking a degree at the time of entry.

Non-matriculated students do not follow the admission requirements of matriculated students. The non-matriculated student status is designed to allow any interested individual to attend college credit courses without declaring a major or seeking a degree. Students must have the prerequisites for any course they wish to register for, permission of the instructor and permission of the Associate Dean of Student Academic Support.

Due to visa requirements, International students are not eligible for non-matriculated status. Non-matriculated students do not receive federal or institutional financial aid.

Students may register up to a maximum of 12 credits as a non-matriculated student. If they wish to continue courses at the College, they would need to apply for matriculated status through the appropriate admissions process. For further information regarding registration for non-matriculated students, please contact the Registrar's office.

NONDISCRIMINATION POLICY

Albany College of Pharmacy and Health Sciences does not discriminate on the basis of race, color, sex, sexual preference, age, religion, creed, national origin, marital status, Vietnam Era Veteran status, disabled Veteran status or disability in its programs and activities. The College's policy of nondiscrimination extends to all areas of College operations, including, but not limited to, admissions, student aid, athletics, employment and educational programs. All the rights, privileges, programs and activities generally accorded to all full-time matriculated students of the College are accorded on a nondiscriminatory basis. Albany College of Pharmacy and Health Sciences is an equal opportunity employer that conforms to the regulations and policies of affirmative action and of Title IX. The following persons have been designated to handle inquiries regarding the nondiscrimination policies:

Title IX Coordinator
*** Contact for all Students ***
Wendy Neifeld Wheeler, Ph.D.
Dean of Students
Library Building, Room 310
Phone: 518-694-7319
Email: titleix@acphs.edu

Title IX Deputy Coordinator
*** Contact for all Employees ***
Human Resources Director
O'Brien Building, Room 001
Phone: 518-694-7278

Academic Policies

Auditing of Courses

The auditing of ACPHS courses is allowed on a space-available basis with the approval of the instructor and chair of the department that offers the course. The degree of participation expected of the auditor is at the discretion of the instructor. Ordinarily, auditors are expected to attend classes regularly, complete reading assignments, and participate in discussions, but are excused from examinations. Auditors meeting these expectations will have a grade of "AU" recorded on their transcript. Auditing a course is limited to those individuals otherwise eligible to register for the class (i.e. matriculated or non-matriculated students). A maximum of one course may be audited per semester. Auditors are subject to the full tuition and fees of the course. Registration of auditors will be done following the completion of the regular registration process. No withdrawals or refunds are granted. Laboratory courses, workshops and other courses that require significant small group work and one-on-one instruction may not be audited. Audited courses do not count in determining a student's course load and do not count toward full-time status. An audited course may be taken for credit at a later date. Audited courses may not be used to satisfy pre-requisites of another course. Auditing a course does not count as having "attempted" the course at ACPHS for the purposes of remediation.

Courtesy Attendance in Classes

Courtesy attendance of ACPHS courses is allowed on a space-available basis. This type of attendance is open to students of the College and other select individuals including, but not limited to, faculty or staff of the College, individuals employed by the College's clinical partners (i.e. clerkship, rotation, or internship sites), and graduate students attending undergraduate courses. There is no fee for or permanent record kept of courtesy attendance in a class. For ACPHS students and faculty permission of the instructor is all that is required. For all others, a formal request to attend classes stating the course and reason why permission is requested should be sent to the appropriate chair and instructor prior to the start of classes. Courtesy attendance is not allowed in laboratory courses, workshops and other courses that require small group work and one-on-one instruction. If the courtesy attendance is determined to be detrimental to the educational environment of the class, the attendee may be requested to stop attending.

CONTINUOUS ACADEMIC QUALITY IMPROVEMENT

ACPHS is committed to being a pre-eminent educational institution that prepares and supports leaders in healthcare. As such, we are engaged in a continuous cycle of development, adaptation, evaluation, and revision of programs and policies. In order to study the effectiveness of admissions procedures, curriculum, student services, student life and other areas, we employ a variety of assessment tools including course evaluations, surveys and focus groups, and analysis of data from scholastic records. The results of the studies will be used by ACPHS administration and faculty to guide decisions focused on providing the optimum academic experience. In order to demonstrate our commitment to continuous improvement of the curriculum, services provided and the general education environment, we may also share results with students, alumni and the public. ACPHS is dedicated to maintaining the confidentiality of any information we collect. Data presented will be in a format which is cumulative and ensures anonymity. Our assessment activities and studies will be monitored by the Office of Institutional Effectiveness. Annual reports will be made to the Institutional Review Board (IRB) regarding assessment studies. Individual studies will be submitted to the IRB for formal review, if appropriate. The IRB will request reports on the status of studies and conduct audits as the IRB deems necessary.

ACCOMMODATIONS UNDER THE AMERICANS WITH DISABILITIES ACT OR SECTION 504 OF THE REHABILITATION ACT

Students at Albany College of Pharmacy and Health Sciences who seek "reasonable accommodation" under the Americans with Disabilities Act or Section 504 of the Rehabilitation Act are responsible for notifying the Director of Counseling and Wellness of their disability. There is an established procedure and form to complete.

This information can be found on the Office of Counseling and Wellness web pages located on the ACPHS intranet site (accessible via the Student Portal under the "Students" tab). Students requesting accommodations are encouraged to read this before meeting with or submitting materials to the Director of Counseling and Wellness.

In brief, the student seeking accommodation must make a formal request for a reasonable accommodation. This request should be made in writing to the Director of Health and Wellness and should specify the nature of the accommodation being requested.

While a student can request a particular type of accommodation, it is the College that determines how to meet a particular need. Therefore, alternative accommodations may be provided that are more cost-effective or efficient than those requested by the student seeking accommodation.
Together with the request for accommodation, the student seeking accommodation must submit documentation of disability, which will be kept on file with the Director of Counseling and Wellness. Such documentation is subject to the provisions of the HIPAA Privacy and Security Rules (Health Insurance Portability and Accountability Act).

The documentation must support the accommodation request by demonstrating by competent qualified opinion that the student requesting accommodation has a physical, mental or learning impairment that substantially limits a major life activity and sets forth the nature, manner and duration of that limitation. The College reserves the right to require further evaluation.

GRADUATION RATES

In compliance with the Student Right to Know Act, ACPHS is pleased to share information on our graduation rates. Six years represents 150% of normal completion time for those seeking a bachelor's degree and 100% of normal time for those seeking a first professional degree. Transfer students enter with prior college experience and so may require fewer semesters to complete their degree programs.

FIRST-YEAR RETENTION RATES

The chart below represents ACPHS's first-year retention from Year One to Year Two for the last five academic years.

FIRST-YEAR RETENTION RATES (STUDENTS PROGRESSING FROM YEAR ONE TO YEAR TWO)

Academic Year	Total Enrolled	Withdrew Passing	Academic Dismissals	Total	Academic% Attrition	Retention*	Total % Retention**
12-13	289	15	24	39	94.3		86.5
13-14	286	41	16	57	94.4		80.1
14-15	254	16	16	32	93.7		80.0
15-16	211	27	17	44	91.9		79.1
16-17	175	17	10	27	94.3		84.6
17-18	197	27	5	32	97.5		83.8

* % Academic Retention is based on an adjusted total enrollment that excludes students who withdrew passing.
** % Total Retention is based on the total attrition number divided by the total enrolled number. Total Enrolled – based on enrollment as of October 15th for Fall and new transfers for Spring.

First-year retention rates are important because they measure the rate at which entering freshmen in a fall semester enroll the following fall semester. Research has found that students are more likely to drop out of postsecondary education during the first year than any other time. Therefore, implementation of policies that help to increase retention rates either within institutions or through transfer, increase the likelihood of students progressing to graduation.

Updated July 2018

Notification of Rights under FERPA

The Family Educational Rights and Privacy Act of 1974 (FERPA) affords students certain rights with respect to their education records. They are:

(1) The right to inspect and review your student education records within 45 days of the day Albany College of Pharmacy and Health Sciences (ACPHS) Registrar receives a request for access. Students should submit to the Registrar written requests that identify the record(s) they wish to inspect. The Registrar will make arrangements for access and notify the student of the time and place where the records may be inspected. ACPHS will respond to reasonable requests for explanations and interpretations of the records.

(2) The right to request an amendment of your student education records that you believe are inaccurate, misleading, or otherwise in violation of your privacy rights. FERPA, however, only allows students to challenge and correct "ministerial errors" in their records, not to bring substantive claims regarding the reasons for a particular notation having been made. Students may ask ACPHS to amend a record that they believe is inaccurate or identify the part of the record they want changed, and specify why it is inaccurate or misleading by writing to the Registrar. If ACPHS decides not to amend the record as requested by the student, ACPHS will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

(3) The right to consent to disclosures of personally identifiable information contained in your student education records, except to the extent that FERPA authorizes disclosure without consent. One exception which permits disclosure without consent is disclosure to ACPHS officials with legitimate educational interests. An ACPHS official is a person employed by ACPHS in an administrative, supervisory, academic, research, or support staff position, or a person or company with whom ACPHS has contracted (such as the College's food service providers. the Bookstore, a database provider, an attorney, auditor, security personnel or collection agent or an enrollment or degree verification service, and includes the National Student Clearing House, the New York State Board of Pharmacy and similar licensing authorities, the National Association of Boards of Pharmacy and National Association of Boards of Pharmacy Foundation and NAPLEX); iParadigms, LLC developers of Turnitin; a person serving on the Board of Trustees of ACPHS; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another ACPHS official in performing his or her tasks. An ACPHS official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional or job responsibilities. Also, FERPA authorizes disclosure to officials of another school, school system, or institution of postsecondary education where the student seeks or intends to enroll, or where the student is already enrolled so long as the disclosure is for purposes related to the student's enrollment or transfer.

(4) The right to refuse to permit the designation of any or all of the following categories of personally identifiable information , hereafter "directory information," which is not subject to the above restrictions on disclosure and may be disclosed by the College at its discretion:

a. name and campus e-mail address
b. city, town or village and state or country of residence
c. class, anticipated date of graduation, major field of study, including the college, division, department, or program in which the student is enrolled
d. participation in officially recognized activities and sports
e. weight and height of members of athletic teams
f. the most recent educational institution attended and previous educational institutions attended and dates of graduation therefrom
g. honors and awards received, including selection to a Dean's list or honorary organization,
h. photographic, video or electronic images of students taken and maintained by ACPHS
i. marital status and spouse's name
j. parents names and city, town or village and state or country of their residence

Any student wishing to exercise this right must inform the ACPHS Registrar in writing, by completing a form available in the Registrar's office, within two weeks of the date you receive this notice, of the categories of personally identifiable information which are not to be designated as directory information with respect to that student.

(5) The right to file a complaint with the U.S. Department of Education concerning alleged failures by ACPHS to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is:

Family Policy Compliance Office
US Department of Education
400 Maryland Avenue, SW
Washington, DC 20202-5920
Phone: (202) 260-3887

Tarun B. Patel
Provost/Vice President of Academic Affairs
Albany College of Pharmacy and Health Sciences
106 New Scotland Avenue, Albany, New York 12208
Phone: 518-694-7337, Fax: 518-694-7294
Email: tarun.patel@acphs.edu

ACPHS GENERAL EDUCATION

The General Education program at ACPHS supports the mission of the College to instill values, attitudes and skills that enable lifelong intellectual, cultural, personal and professional growth. Courses offered in the first two years expand the student's historical, cultural, literary, scientific and philosophical perspectives. These courses also foster the critical assessment of ethical and humanistic values, and emphasize the communication, critical thinking and problem-solving skills that prepare the student to advance in their professional discipline and cultural competency. Through its blend of required and elective courses, the College strives to expose students to the complexities of the world and prepare them to become valuable participants. The College's adaptations of the American Association of Colleges of Pharmacy's Center for the Advancement of Pharmacy Education's educational outcomes are:

ABILITY-BASED OUTCOMES

THINKING ABILITIES: Think critically, solve complex problems and make informed, rational, responsible decisions within scientific, social, cultural, legal, clinical and ethical contexts.

- Identify, retrieve, understand, apply, analyze, synthesize and evaluate information needed to make informed, rational, responsible and ethical decisions.
- Solve complex problems that require an integration of one's ideas and values within a context of scientific, social, cultural, legal, clinical and ethical issues.
- Display habits, attitudes and values associated with mature critical thinking.

COMMUNICATION ABILITIES: Communicate clearly, accurately and persuasively with various audiences using a variety of methods and media.

- Read and listen effectively.
- Effectively communicate in speaking and writing, choosing strategies and media that are appropriate to the purpose of the interaction and to the ideas, values and background of the audience.

RESPONSIBLE USE OF VALUES AND ETHICAL PRINCIPLES: Systematically make and defend rational, ethical decisions regarding potentially complex personal, societal and professional situations within a context of personal and professional values.

SOCIAL AWARENESS, SOCIAL RESPONSIBILITY AND CITIZENSHIP

- Demonstrate sensitivity and tolerance of cultural diversity in all interactions and settings.
- Demonstrate an appreciation of the obligation to participate in efforts to help individuals and to improve society and the health care system.

SELF-LEARNING ABILITIES AND HABITS: Self-assess learning needs and design, implement and evaluate strategies to promote intellectual growth and continued professional competence.

- Establish personal and professional learning goals and determine areas of deficiency and/or interest.
- In order to achieve established learning goals, engage in learning activities on an ongoing basis for personal or professional development based on self-determined areas of deficiency and/or interest.

SOCIAL INTERACTION: Function effectively in interactions with individuals, within group situations, within the workplace and within professional organizations and systems.

NUMERACY: Use mathematics effectively to meet the demands of day-to-day life at home, at work and in society.

Academics

Bachelor's Programs

Biomedical Technology

Clinical Laboratory Sciences

Microbiology

Pharmaceutical Sciences

Public Health

Pre-Med

Pre-PA

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

PROGRAM DIRECTORS

Undergraduate Degree Programs:

Bachelor of Science in Biomedical Technology	Mohamad G. Kolakji
Bachelor of Science in Clinical Lab Sciences	Mohamad G. Kolakji
Bachelor of Science in Health and Human Sciences	Wendy Parker
Bachelor of Science in Microbiology	Meenakshi Malik
Bachelor of Science in Pharmaceutical Sciences	Lauren Purington
Bachelor of Science in Public Health	Wendy Parker
Pre-Pharmacy Program	Katie Cardone and Eric Yager
Pre-Professional Pathways	Elizabeth Brookins

Doctorate Degree Program:

Doctor of Pharmacy	Bob Hamilton

Graduate Degree Programs:

Master of Science in Cytotechnology & Molecular Cytology	Jenna LeBlanc
Master of Science in Clinical Lab Sciences	Mohamad G. Kolakji
Master of Science in Health Outcomes & Informatics	Colleen McLaughlin
Master of Science in Molecular Biosciences	Meenakshi Malik
Master of Science in Pharmaceutical Sciences	Jeff Voigt

BACHELOR OF SCIENCE IN BIOMEDICAL TECHNOLOGY

The Biomedical Technology program allows students to explore the many facets of human health and disease with an emphasis on the contribution of diagnostic laboratory medicine to medical practice. Students in the Biomedical Technology program have a variety of options based on their personal interests and career goals.

The Program provides a strong foundation in basic and clinical sciences. Students are prepared to seek positions in the biomedical device industry such as research, technical support and sales or to pursue admission to MS programs in Physician Assistant Studies. Incoming freshman students may apply for early assurance acceptance to the MS in Physician Assistant Studies at Albany Medical College. (This track does not lead to certification or licensure. See the BS in Clinical Laboratory Sciences.)

The curriculum in Biomedical Technology is designed to assure that all students are able to:

- Interpret Clinical Laboratory Testing
    - Evaluate appropriateness and quality of laboratory specimens and handle them safely
    - Evaluate test results to assure accuracy of analyses and correlate with medical history and diagnosis
- Promote Public Health
    - Promote public awareness of health and disease

- Demonstrate Professionalism
    - Demonstrate professional conduct and interpersonal communication skills with patients, laboratory personnel, other health care professionals and the public
    - Establish and maintain continuing education for self and others to maintain lifelong learning and professional competence
    - Provide leadership in educating other health care professionals on issues related to the clinical laboratory
    - Read and evaluate published professional literature for its pertinence and reliability and explain the basic principles of the scientific method
- Understand Health Care Systems and the Role of the Medical Laboratory
    - Explain the role of the regulatory agencies that oversee the clinical laboratory and of the regulations pertinent to the laboratory and the healthcare organization in which the laboratory resides
    - Explain the organizational structure of healthcare organizations and the role of the clinical laboratory in the provision of patient care

- Practice the principles of diagnostic thought process and evidence based medicine
    - Critically evaluate current publications on diagnostic process including laboratory results
    - Articulate the principles of evidence based medicine in the diagnostic process

BS BIOMEDICAL TECHNOLOGY REQUIRED COURSES

Communications: 6 required credits[1]
COM 115: Principles of Communication (3)
BHS 230: Sophomore Seminar (3)

[1]All incoming students are assessed for their writing ability. The assessment is designed to direct students to the courses for which they are best prepared in the first year of the curriculum.

Humanities, Culture and Health: 18 required credits
HUM 101, 102 and 201: The Pre-Modern World, The Modern World, The Contemporary World (3, 3, 3)
ETH 310: Bioethics (3)
PSY 101: General Psychology (3)
Social Science Elective (3)

Basic Sciences: 39 required credits
BIO 101 and 102: General Biology I and II (4, 4)
BIO 213 and BIO 214: Anatomy and Physiology I and lab (3, 1)
BIO 215 and BIO 216: Anatomy and Physiology II and Lab (3, 1)
BIO 235: Cell Biology (3)
BIO 236: Cell Biology Laboratory (1)
CHE 101 and 102: General Chemistry I and II (4, 4)
CHE 245: Survey of Organic Chemistry (4)
CHE 311: Biochemistry I (3)
CLS 348 Clinical Biochemical Techniques (1)
MAT 145: Elementary Statistics (3)

Biomedical Sciences: 10 required credits
BHS 201: Medical Terminology (3)
BHS 740 G: Genetics and Molecular Basis of Disease (4)
BHS 450: Senior Seminar in Biomedical Technology (3)

Clinical Sciences: 29 required credits
CLS 327 and 329: Clinical Microbiology I and II (3, 3)
CLS 328 and 330: Clinical Microbiology I and II Lab (1, 1)
CLS 317: Clinical Hematology (3)
CLS 318: Clinical Hematology Lab (1)
CLS 307: Urinalysis and Body Fluids (1)
CLS 308: Urinalysis and Body Fluids Lab (1)
CLS 337: Clinical Immunology (3)
CLS 338: Clinical Immunology Lab (1)
CLS 339: Immunohematology (3)
CLS 340: Immunohematology Lab (1)
CLS 346: Clinical Chemistry (3)
CLS 347: Clinical Chemistry Lab (1)
BHS 410 Clinical Correlations for Health Care Professionals (3)

Electives: 24 elective credits
Directed Electives (18)
Free electives (6)

Total Credits: 126 credits

BS IN BIOMEDICAL TECHNOLOGY SAMPLE SCHEDULE

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 101	Pre-Modern World	3		MAT 145	Elementary Statistics	3
COM 115	Principles of Communication	3		HUM 102	Modern World	3
PSY 101	General Psychology	3			Elective	3
	Total	**17**			**Total**	**17**

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
HUM 201	Contemporary World	3		BHS 230	Sophomore Seminar	3
BIO 213	Anatomy and Physiology I	3		BIO 215	Anatomy and Physiology II	3
BIO 214	Anatomy and Physiology I Lab	1		BIO 216	Anatomy and Physiology II Lab	1
BHS 201	Medical Terminology	3		BIO 235	Cell Biology	3
	Social Science Elective	3		BIO 236	Cell Biology Lab	1
	Elective	3		CHE 245	Survey of Organic Chemistry	4
	Total	**16**			**Total**	**15**

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CLS 327	Clinical Microbiology I	3		CLS 329	Clinical Microbiology II	3
CLS 328	Clinical Microbiology I Lab	1		CLS 330	Clinical Microbiology II Lab	1
CHE 311	Biochemistry I	3		CLS 346	Clinical Chemistry	3
CLS 348	Clinical Biochemical Techniques	1		CLS 347	Clinical Chemistry Lab	1
CLS 317	Clinical Hematology	3		CLS 339	Immunohematology	3
CLS 318	Clinical Hematology Lab	1		CLS 340	Immunohematology Lab	1
CLS 307	Urinalysis and Body Fluids	1		CLS 337	Clinical Immunology	3
CLS 308	Urinalysis and Body Fluids Lab	1		CLS 338	Clinical Immunology Lab	1
ETH 310	Bioethics	3				
	Total	**17**			**Total**	**16**

Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BHS 740	Genetics and Molecular Basis of Disease	4		BHS 450	Senior Seminar in Biomedical Technology	3
BHS 410	Clinical Correlations for Health Care Professionals	3			Directed Electives	9
	Directed Electives	9				
	Total	**16**			**Total**	**12**

BS in Biomedical Technology/MS Cytotechnology and Molecular Cytology:

Upon completion of the third year of core courses, students may elect to enter the BS Biotechnology/MS Cytotechnology and Molecular Cytology program. They continue their education with training in microscopic examinations of human cell samples in order to identify inflammatory or cancerous changes in cell morphology. The Cytotechnology and Molecular Cytology program is the largest in the country and the only academic-based program in New York State. Graduates are eligible for accreditation nationally and for licensure in the state of New York State. (For course information, see the MS in Cytotechnology and Molecular Cytology program.)

BS in Biomedical Technology/MS Clinical Laboratory Sciences:

Students electing to pursue the combined BS in Biomedical Technology and the MS in Clinical Laboratory Sciences will complete the first two years of the Biomedical Technology program and use the third year of the curriculum to complete the requirements for admission into the MS program and to take additional coursework in upper level sciences, public health or other health related courses that support entrance into the MS program. (For course information, see the MS in Clinical Laboratory Sciences Program.)

BACHELOR OF SCIENCE IN CLINICAL LABORATORY SCIENCES

The Clinical Laboratory Sciences program prepares students to perform a full range of laboratory analyses that are essential for the diagnosis, monitoring and treatment of disease. These laboratory analyses are applicable to the fields of human and veterinary medicine, forensics, drug development and research. Graduates are eligible for national certification through the American Society of Clinical Pathology as well as licensure in the state of New York as Clinical Laboratory Technologists.

The curriculum in Biomedical Technology is designed to assure that all students are able to:

- Perform Clinical Laboratory Testing
    - Evaluate appropriateness and quality of laboratory specimens and handle them safely
    - Accurately and efficiently perform analytic analyses in all areas of the clinical laboratory
    - Evaluate test results to assure accuracy of analyses and correlate with medical history and diagnosis
- Participate in the Daily Management of the Clinical Laboratory
    - Apply and properly follow all safety requirements within the laboratory and health care facility
    - Evaluate new testing methods and instrumentation for accuracy, precision, specificity, sensitivity and appropriateness to patient care
    - Explain the principles of human resources management
- Promote Public Health
    - Promote public awareness of health and disease
    - Recognize the role of the laboratory in disaster management
- Provide Laboratory Information and Education
    - Demonstrate professional conduct and interpersonal communication skills with patients, laboratory personnel, other health care professionals and the public
    - Establish and maintain continuing education for self and others to maintain lifelong learning and professional competence
    - Provide leadership in educating other health care professionals on issues related to the clinical laboratory
    - Read and evaluate published professional literature for its pertinence and reliability and explain the basic principles of the scientific method
- Understand Health Care System and the Role of the Medical Laboratory
    - Explain the role of the regulatory agencies that oversee the clinical laboratory and of the regulations pertinent to the laboratory and the healthcare organization in which the laboratory resides
    - Explain the organizational structure of healthcare organizations and the role of the clinical laboratory in the provision of patient care

BS CLINICAL LABORATORY SCIENCES REQUIRED COURSES

Communications: 6 required credits[1]
COM 115: Principles of Communication (3)
BHS 230: Sophomore Seminar (3)

[1]All incoming students are assessed for their writing ability. The assessment is designed to direct students to the courses for which they are best prepared in the first year of the curriculum.

Humanities, Culture and Health: 18 required credits
HUM 101, 102 and 201: The Pre-Modern World, The Modern World, The Contemporary World (3, 3, 3)
ETH 310: Bioethics (3)
PSY 101: General Psychology (3)
Social Science Elective (3)

Basic Sciences: 39 required credits
BIO 101 and 102: General Biology I and II (4, 4)
BIO 213 and BIO 214: Anatomy and Physiology I and lab (3, 1)
BIO 215 and BIO 216: Anatomy and Physiology II and Lab (3, 1)
BIO 235: Cell Biology (3)
BIO 236: Cell Biology Laboratory (1)
CHE 101 and 102: General Chemistry I and II (4, 4)
CHE 245: Survey of Organic Chemistry (4)
CHE 311: Biochemistry I (3)
CLS 348 Clinical Biochemical Techniques (1)
MAT 145: Elementary Statistics (3)

Biomedical Sciences: 7 required credits
BHS 201: Medical Terminology (3)
BHS 740 G: Genetics and Molecular Basis of Disease (4)

Clinical Sciences: 50 required credits
CLS 327 and 329: Clinical Microbiology I and II (3, 3)
CLS 328 and 330: Clinical Microbiology I and II Lab (1, 1)
CLS 317: Clinical Hematology (3)
CLS 318: Clinical Hematology Lab (1)
CLS 307: Urinalysis and Body Fluids (1)
CLS 308: Urinalysis and Body Fluids Lab (1)
CLS 337: Clinical Immunology (3)
CLS 338: Clinical Immunology Lab (1)
CLS 339: Immunohematology (3)
CLS 340: Immunohematology Lab (1)
CLS 346: Clinical Chemistry (3)
CLS 347: Clinical Chemistry Lab (1)
CLS 400: Laboratory Management and Education (3)
CLS 410: Clinical Correlations (3)
CLS 401 and 402: Clinical Practicum I and II (9, 9)

Electives: 9 elective credits
Free electives (9)
Total Credits: 129 credits

BS IN CLINICAL LABORATORY SCIENCES SAMPLE SCHEDULE

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 101	Pre-Modern World	3		MAT 145	Elementary Statistics	3
COM 115	Principles of Communication	3		HUM 102	Modern World	3
PSY 101	General Psychology	3			Elective	3
	Total	**17**			**Total**	**17**

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
HUM 201	Contemporary World	3		BHS 230	Sophomore Seminar	3
BIO 213	Anatomy and Physiology I	3		BIO 215	Anatomy and Physiology II	3
BIO 214	Anatomy and Physiology I Lab	1		BIO 216	Anatomy and Physiology II Lab	1
BHS 201	Medical Terminology	3		BIO 235	Cell Biology	3
	Social Science Elective	3		BIO 236	Cell Biology Lab	1
	Elective	3		CHE 245	Survey of Organic Chemistry	4
					Elective	3
	Total	**16**			**Total**	**18**

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CLS 327	Clinical Microbiology I	3		CLS 329	Clinical Microbiology II	3
CLS 328	Clinical Microbiology I Lab	1		CLS 330	Clinical Microbiology II Lab	1
CHE 311	Biochemistry I	3		CLS 346	Clinical Chemistry	3
CLS 348	Clinical Biochemical Techniques	1		CLS 347	Clinical Chemistry Lab	1
CLS 317	Clinical Hematology	3		CLS 339	Immunohematology	3
CLS 318	Clinical Hematology Lab	1		CLS 340	Immunohematology Lab	1
CLS 307	Urinalysis and Body Fluids	1		CLS 337	Clinical Immunology	3
CLS 308	Urinalysis and Body Fluids Lab	1		CLS 338	Clinical Immunology Lab	1
ETH 310	Bioethics	3				
	Total	**17**			**Total**	**16**

Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BHS 740	Genetics and Molecular Basis of Disease	4		CLS 410	Clinical Correlations	3
CLS 400	Laboratory Management and Education	3		CLS 402	Clinical Practicum II	9
CLS 401	Clinical Practicum I	9				
	Total	**16**			**Total**	**12**

BACHELOR OF SCIENCE IN MICROBIOLOGY

The goal of the B.S. Microbiology program at Albany College of Pharmacy and Health Sciences is to prepare graduates for employment or advanced study in fields requiring knowledge of microbial life, e.g., health care, public health, biotechnology, pharmaceutical sciences, medical equipment and supplies industry. There is a core of courses for each of these varied employment and educational opportunities and depending upon the student's goals, specific tracks will be chosen in consultation with the microbiology advisors in the Department.

The program has three tracks that allow students to specialize in Biomedical Microbiology, Epidemiology/Public Health, or Industrial/Pharmaceutical Microbiology. All three tracks in the program abide by the core curriculum guidelines of the American Society for Microbiology for the baccalaureate degree program in microbiology. The students graduating from this program will meet the educational requirements (of having a BS with 20 semester hours of microbiology relevant courses) for certification by the National Registry of Microbiologists (NRM), a professional branch of the American College of Microbiology within the American Society for Microbiology (ASM). Graduates will be fully prepared to take the written exam for registered microbiologist or conditional registrant in Pharmaceutical and Medical Device and/or Biological Safety.

All graduates of the program are expected to fully integrate the theory and practical aspects of microbiology and to:

- demonstrate a working knowledge of traditional and emerging areas of microbiology
- obtain, interpret, and apply information about microbiology from the scientific literature
- integrate and apply knowledge to solve complex scientific problems
- formulate hypotheses to explain research problems and demonstrate an understanding of the facilities and expertise necessary for testing these hypotheses
- possess appropriate laboratory skills including the ability to observe and record results, work safely, self-organize and manage one's time
- effectively communicate scientific information both orally and in writing
- work both independently and collaboratively in scientific processes
- understand their ethical and professional responsibilities and be aware of the contemporary societal and global issues facing scientists

The following is a brief description and career objectives for each of the three tracks of the program:

BIOMEDICAL MICROBIOLOGY TRACK will train graduates in understanding how infectious diseases occur. It will serve as the foundation for advanced graduate studies in Microbiology, Immunology, Virology, Cellular and Molecular Biology, and Pharmaceutical Sciences. Graduates would be prepared for entry into the professional schools such as medicine, veterinary, dental, and public health. Graduates may find jobs as research technicians in laboratories working in the area of microbiology and infectious diseases.

PUBLIC HEALTH MICROBIOLOGY/INFECTIOUS DISEASE EPIDEMIOLOGY TRACK will offer instruction on the concepts, methods, and application of epidemiological principles related to infectious diseases. Graduates of the program will have an in-depth understanding of the major laboratory and public health aspects of microbial pathogens. They will gain epidemiologic skills relevant to the prevention and control of problems arising from infectious diseases. Graduates will be prepared for careers in academic and industrial research laboratories, international health agencies, nongovernmental organizations and private consulting groups. In addition, they may work in federal, state and local public health agencies or state and local public health laboratories where their technical expertise and population-based perspective will be extremely useful.

INDUSTRIAL/PHARMACEUTICAL MICROBIOLOGY TRACK will prepare the students for the scientific principles, techniques and skills required in industrial microbiology. Specialized study will include biotechnology applications, biochemistry, analytical chemistry and pharmaceutical microbiology. This track will train students in the areas of microbial contamination prevention, investigation, control and aseptic processing. Students will gain experience in pharmaceutical processing and manufacturing and healthcare issues. Graduates will acquire skills required for quality control of raw materials and finished products, knowledge in drug and environmental regulations and guidelines along with learning the principles of Good Manufacturing Practices.

Information regarding joint programs between the BS in Microbiology Program and other institutions can be found in the Articulation Agreements and Joint Degree Programs section.

BS IN MICROBIOLOGY REQUIRED COURSES

All students, regardless of track selected, will complete the following core curriculum. Students will be required to complete one of the tracks described below. Each track contains 9-11 credits of required courses. Students must also choose 5-6 credits from a list of approved track electives.

CORE CURRICULUM

Basic Sciences: 39 required credits
BIO 101 and 102: General Biology I and II (4, 4)
CHE 101 and CHE 102: General Chemistry I and II (4, 4)
CHE 201 and 202: Organic Chemistry I and II (4, 4)
PHY 212 and 222: College Physics I and II (4, 4)
MAT 121: Calculus I (4)
MAT 145: Elementary Statistics (3)

Humanities and Communication: 14 required credits [1]
HUM 101, 102 and 201: The Pre-Modern World (3), The Modern World (3), The Contemporary World (3)
COM 115: Principles of Communication (3)
BIO 253: Scientific Communications (2) [or other comparable course(s)]

Microbiology: 33 required credits
BIO 210: Microbiology (4)
PSC 315: Immunology (3)
PSC 311: Biochemistry (3)
BIO 235: Cell Biology (3)
BIO 340: Microbial Genetics (3)
BIO 370: Microbial Physiology (3)
BIO 350 and 355: Biomedical Laboratory Techniques I and II (3, 3)
BIO 480 and BIO 485: Microbiology Capstone Experience I and II (3, 3)
Options for Microbiology Capstone Experience - Research (a minimum of 3 credits), Internships, and/or Independent Projects. The plan for the Capstone Experience should be developed by the student in conjunction with the faculty adviser and Program Director and approved in spring of the Junior Year.
BIO 660G: Microbiology Journal Club (1+1) – course is taken twice

Electives: 21 credits
At least 9 credits must be in the humanities or social sciences.

TRACK CURRICULUM

BIOMEDICAL MICROBIOLOGY TRACK
BIO 680G: Bacterial Pathogenesis (3)
BIO 240: Virology (3)
BIO 365: Medical Mycology and Parasitology (3)
A minimum of 5 credits chosen from BIO 225: Genetics (3), BIO 213: Anatomy & Physiology I (3), BIO 215: Anatomy & Physiology II (3), ETH 310: Bioethics (3), BIO 240: Virology (3), BIO 365: Medical Mycology and Parasitology (3), PSC 321: Physiology/Pathophysiology I (3), PSC 322 Physiology/Pathophysiology II (3), BIO 625G: Advanced Molecular Biology (3), BIO 630G: Advanced Cell Biology (3), BHS 745G: Molecular Diagnostics (3), BIO 620G: Advanced Topics in Microbiology (3). Other courses may be counted at the discretion of the Program Director.

PUBLIC HEALTH MICROBIOLOGY/INFECTIOUS DISEASE EPIDEMIOLOGY TRACK
SOC 120: Introduction to Public Health (3)
PAD 393: Introduction to Epidemiology (3)
BIO 315: Public Health Microbiology (3)
A minimum of 5 credits chosen from PSC 432: Infectious Disease Pharmacology (3), ETH 310: Bioethics (3), HRI 600G: Issues in Global Health (3), PHM 350: Applied Methods in Epidemiological Research (3), BIO 270: Public Health Toxicology (3), HRI 646G: Epidemiology II (3). Other courses may be counted at the discretion of the Program Director.

INDUSTRIAL/PHARMACEUTICAL MICROBIOLOGY TRACK
BIO 360: Industrial Microbiology and Bioprocessing (3)
BIO 260: Public Health Toxicology
BIO 410: Pharmaceutical Microbiology (3)
A minimum of 5 credits chosen from PSC 341: Pharmaceutics I (3), PSC 342: Pharmaceutics II (3), CHE 375: Analytical Chemistry I (4), CHE 380: Analytical Chemistry II (4), BIO 455: Toxicology (3), SOC 335: Public and Health Policy (3). Other courses may be counted at the discretion of the Program Director.

TOTAL CREDITS: 121-124 CREDITS

[1]All incoming students are assessed for their writing ability. The assessment is designed to direct students to the courses for which they are best prepared in the first year of the curriculum.

BIOMEDICAL MICROBIOLOGY SAMPLE SCHEDULE

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
MAT 121	Calculus I	4		COM 115	Principles of Communication	3
					Elective 1	3
	Total	**15**			**Total**	**17**

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4		CHE 212	Organic Chemistry II	4
PHY 212	College Physics I	4		PHY 222	College Physics II	4
HUM 201	The Contemporary World	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 240	Virology	3
					Elective 2	3
	Total	**15**			**Total**	**17**

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 311	Biochemistry	3		BIO 365*	Medical Mycology & Parasitology	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 370	Microbial Physiology	3		BIO 355	Biomedical Lab Techniques II	3
BIO 350	Biomedical Lab Techniques I	3		BIO 235	Cell Biology	3
	Elective 3	3			Elective 4	3
	Total	**15**			**Total**	**15**

Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3		BIO 485	Micro. Capstone Experience II	3
CHE 253	Scientific Communication	2		BIO 680	Bacterial Pathogenesis	3
BIO 660G	Journal Club	1		BIO 660G	Journal Club	1
	Track Elective I	3			Track Elective II	3
	Elective 5	3			Elective 7	3
	Elective 6	3				
	Total	**15**			**Total**	**13**

PUBLIC HEALTH MICROBIOLOGY/INFECTIOUS DISEASE EPIDEMIOLOGY TRACK SAMPLE SCHEDULE

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
MAT 121	Calculus I	4		COM 115	Principles of Communication	3
					Elective 1	3
	Total	**15**			**Total**	**17**

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4		CHE 212	Organic Chemistry II	4
PHY 212	College Physics I	4		PHY 222	College Physics II	4
HUM 201	The Contemporary World	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4			Elective 2	3
SOC 120	Intro to Public Health	3				
	Total	**18**			**Total**	14

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 311	Biochemistry	3		BIO 235*	Cell Biology	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3		BIO 355	Biomedical Lab Techniques II	3
BIO 370	Microbial Physiology	3		PAD 393	Intro to Epidemiology	3
BIO 315	Public Health Microbiology	3			Elective 3	3
	Total	**15**			**Total**	**15**

Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3		BIO 485	Micro. Capstone Experience II	3
CHE 253	Scientific Communication	2			Track Elective II	3
BIO 660G	Journal Club	1		BIO 660G	Journal Club	1
	Track Elective I	3			Elective 6	3
	Elective 4	3			Elective 7	3
	Elective 5	3				
	Total	**15**			**Total**	**13**

INDUSTRIAL/PHARMACEUTICAL MICROBIOLOGY TRACK SAMPLE SCHEDULE

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
MAT 121	Calculus I	4		COM 115	Principles of Communication	3
					Elective 1	3
	Total	**18**			**Total**	**17**

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4		CHE 212	Organic Chemistry II	4
PHY 212	College Physics I	4		PHY 222	College Physics II	4
HUM 201	The Contemporary World	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 260	Public Health Toxicology	3
					Elective 2	3
	Total	**15**			**Total**	**17**

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 311	Biochemistry	3		BIO 235*	Cell Biology	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 370	Microbial Physiology	3		BIO 355	Biomedical Lab Techniques II	3
BIO 350	Biomedical Lab Techniques I	3		BIO 410	Pharmaceutical Microbiology	3
	Track Elective I	3			Elective 3	3
	Total	**15**			**Total**	**15**

Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3		BIO 485	Micro. Capstone Experience II	3
CHE 253	Scientific Communication	2		BIO 660G	Journal Club	1
BIO 660G	Journal Club	1		BIO360	Industrial Micro/Bioprocessing	3
PSC 431	Foundations of Pharm. Sci.	2			Elective 6	3
	Elective 4	4			Elective 7	3
	Track Elective II	3				
	Elective 5	3				
	Total	**17**			**Total**	**13**

* Spring 2018 graduates may substitute PSC312: Molecular Biology course for BIO235: Cell Biology. Graduates after Spring 2018 are required to take Cell Biology.

BS in Microbiology / MS Molecular Biosciences

This dual degree program allows students to obtain a B.S. in Microbiology and an M.S. in Molecular Biosciences in five years (as opposed to six). The addition of the master's degree in Molecular Biosciences will provide students with a stronger foundation in research, giving them a competitive advantage whether they choose to pursue employment opportunities immediately following graduation or decide to continue their education in a Ph.D. or professional program.

For course information, see the MS in Molecular Bioscience Program.

BACHELOR OF SCIENCE IN PUBLIC HEALTH

Public health at ACPHS is an integrated program grounded in an understanding of the life sciences, human health, and the social determinants of health, and focused on community engagement and critical reflection within the contemporary health care environment. Public health integrates scientific foundations of health and principles from the social and behavioral sciences and the humanities to engage in an interdisciplinary manner with modern health and health care.

The curriculum aims to fulfill these goals by ensuring that students:

- understand basic biological principles relevant to health and illness
- explain the social determinants of health - cultural, social, psychological, and economic dimensions of health and illness
- demonstrate skills in cultural competency
- participate effectively in teams as both leaders and members
- understand the structure and function of public health and healthcare organizations and systems
- evaluate ethical and human rights principles related to health
- examine human health issues through an interdisciplinary and multi-sectorial perspective
- critically analyze the primary research literature using a data driven perspective
- communicate public health principles and messages, in writing and orally, to diverse audiences
- design and implement health promotion and disease prevention strategies

Our program covers the basic foundations of humanities, natural sciences, quantitative reasoning, social sciences, and core public health dimensions. It also includes a capstone experience and professional development, while retaining flexibility to utilize electives to cultivate deeper expertise in an area or topic of interest. Students will select either the Community Health or Health Analytics track within the BS in Public Health program.

The program prepares students to enter the workforce in a health-related field and provides them with a solid foundation to pursue advanced studies in graduate or professional school. With this training, students completing this program are well prepared for:

- Entry level positions in health education and promotion or positions in research and program coordination at the research assistant level
- Graduate or advanced training in public health, health administration, data analytics, and health services research
- Additional training in clinical or professional education, including but not limited to MS in Physician's Assistant Studies and Medical School

BS IN PUBLIC HEALTH REQUIRED COURSES

All students will complete the foundational courses (57 credits), the Public Health core (42 credits) and the free electives (15 credits). Students also must complete one set of track courses (12 credits). The total number of credits required for the program is 126.

Foundational Courses: 57 Credit Hours
Humanities/Fine Arts/Communication (18 Credits)
HUM 101 and 102: Pre-Modern World and Modern World (3, 3)
HUM 201: Contemporary World or equivalent (3)
COM 101: Academic Reading and Writing or equivalent (3)
COM 120: Public Speaking (3)
PHI 145: Logic and Reasoning (3)

Social Sciences (12 credits)
SOC 101: Introduction to Sociology (3)
PSY 101: General Psychology (3)
ECN 101: Introductory Economics (3)
HIS 110: American Government or equivalent (3)

Basic Sciences (11 credits)
BIO 101 and BIO 102: General Biology I and II (4, 4)
PBH 220: Environmental Health (3)

Quantitative Reasoning (11 credits)
MAT 121: Calculus I (4)
MAT 155: Statistics (3)
PBH 210/211: Introduction to Data/Data Lab (4)

Professional Development (5 Credits)
BSS 102 and BSS 302: Seminar in Health Professions (1, 1)
HHS 401: Capstone (3)

Public Health Core: 42 Credit Hours
SOC 120: Intro to Public Health (3)
SOC 420: Health and Social Policy (3)
SOC 335: Global Health (3)
PAD 393: Epidemiology (3)
PBH 320: Geography of Health (3)
PBH 345: Community Health Practice (3)
PBH 435: Interdisciplinary Perspectives and Methods (2)
PSY 321 or COM 312: Health Promotion (3) or Health Psychology (3)
ETH 310: Bioethics (3)
BIO 245: Biological Basis of Disease (3)*
Applied Biological Science Selective (3)* One course chosen from:
BIO 260: Public Health Toxicology, BIO 213: Anatomy and Physiology I, BIO 215: Anatomy and Physiology II, BHS 360: Clinical Anatomy, PHM 334: Environmental Health, BIO 225: Genetics
SOC 301: Research Methods (4)
Applied Research Methods Course (3)
One course chosen from COM 350 Qualitative Research Methods, PBH 360 Field Epidemiology, PBH 340 Survey Research Methods
Health Care Systems Selective (3)
One course chosen from COM 320: Patient-Provider Communication, ECN 317: Health Economics, PAD 515: Pharmacoeconomics, PSY 440: Death and Dying, SOC 325: Medical Sociology, HIS 330: History of Public Health and Medicine, PAD 451: US and Global Health Care Systems (3); additional courses approved by program director

*Students may substitute BIO 213 and BIO 215: Anatomy and Physiology I and II for Biological Basis of Disease and the Applied Biological Science Selective.

Free Electives: 15 Credit Hours

Tracks (choose 1 of the following tracks): 12 Credit Hours

Community Health Track
SOC 350: Disparities and Social Justice (3)
COM 315: Health Campaigns (3)
Culture and Health Selective (3). One course chosen from:
COM 330: Intercultural Communication in Health Care, HUM 386: Culture, Customs and Health of Belize, HIS 325: History of the Plagues, SOC 330: Cultures of Disability
Critical Reflection Selective (3)
One course chosen from ETH 315 Illness, Disease, and Authority, PSY 440: Death and Dying, SOC 325: Medical Sociology, HIS 330: History of Public Health and Medicine

Health Analytics Track
Advanced Methods Selective(3)
One course chosen from COM 350 Qualitative Research Methods, PBH 360 Field Epidemiology, PBH 340 Survey Research Methods
PAD 636: SAS Programming (3)
MAT 610: Statistical Inference and Modeling (3)
Data Intensive Selectives (3):
One course chosen from ECN 317: Health Economics (3) or PBH 3xx Visual Analytics or other approved data intensive course

[1]All incoming students are assessed for their writing ability. The assessment is designed to direct students to the courses for which they are best prepared in the first year of the curriculum.

BS IN PUBLIC HEALTH SAMPLE SCHEDULE

Year 1					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
HUM 101	Pre-Modern World	3	HUM 102	Modern World	3
BIO 101	General Biology I	4	BIO 102	General Biology II	4
COM 101	Academic Reading and Writing Or Equivalent	3	COM 120	Public Speaking	3
PSY 101	Psychology	3	SOC 101	Sociology	3
SOC 120	Intro to Public Health	3	ECN 101	Economics	3
BSS 102	Seminar in Health Professions	1			
	Total	17		Total	16

Year 2					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
HUM 201 Or HUM 220	Contemporary World Or Medical Humanities	3	PHI 145	Logic and Reasoning	3
BIO 245	Biological Basis of Disease	3	PBH 210/ PBH 211	Intro to Data	4
MAT 121	Calculus I	4		Applied Biological Science Selective [Multiple to Choose from]	3
HIS 110	American Government	3		Elective	3
	Elective	3	MAT 155	Statistics	3
	Total	16		Total	16

Year 3					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
ETH 310	Bioethics	3	PBH 320	The Geography of Health	3
SOC 301	Research Methods	3	PBH 3xx	Applied Research Methods Selective [Multiple to Choose from]	3
ETH 3xx	Research Ethics Workshop	1	PBH 220	Environmental Health	3
BSS 302	Seminar in Health Professions	1	COM 312 or PSY 321	Health Promotion or Health Psychology	3
SOC 335	Global Health	3	SOC 350 MAT 315	TRACK COURSE 1 [Disparities and Social Justice] [SAS Programming]	3
PAD 393	Epidemiology	3		Elective	3
	Total	14		Total	18

Year 4					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
SOC 420	Health and Public Policy	3	HHS 401	Capstone	3
PBH 435	Interdisciplinary Perspectives on HC	2		Healthcare Systems Selective	3
COM 315 ECN 317	TRACK COURSE 2 [Health Campaigns] [Statistical Inference and Modeling]	3		TRACK COURSE 4 [Critical Reflection Selective] [Advanced Methods Selective]	3
	TRACK COURSE 3 [Culture and Health Selective] [Data Intensive Selective]	3		Elective	3
	Capstone or Elective	3	PBH 345	Community Health Practice	3
	Total	14		Total	15

Total Credits: 126

BS Microbiology/MS Molecular Biosciences Dual Degree Program

This dual degree program allows students to obtain a B.S. in Microbiology and an M.S. in Molecular Biosciences in five years (as opposed to six). The addition of the master's degree in Molecular Biosciences will provide students with a stronger foundation in research, giving them a competitive advantage whether they choose to pursue employment opportunities immediately following graduation or decide to continue their education in a Ph.D. or professional program.

For more information about the new B.S. in Microbiology / M.S. in Molecular Biosciences program, please view the sample curricular grid (attached) or contact Associate Professor Meenakshi Malik at 694-7168 or Meenakshi.Malik@acphs.edu.

BS MICROBIOLOGY WITH MS MOLECULAR BIOSCIENCES – DUAL DEGREE SAMPLE SCHEDULE

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
MAT 121	Calculus I	4		COM 115	Principles of Communication	3
					Elective 1	3
	Total	**15**			**Total**	**17**

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 201	Organic Chemistry I	4		CHE 202	Organic Chemistry II	4
PHY 212	College Physics I	4		PHY 222	College Physics II	4
HUM 201	The Contemporary World	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 240	Virology (Req'd Track 1)	3
CHE 253	Scientific Communications	2			Elective 2	3
	Total	**17**			**Total**	**17**

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 311	Biochemistry	3		BIO 365	Medical Mycology & Parasitology	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 370	Microbial Physiology	3		BIO 355	Biomedical Lab Techniques II	3
BIO 350	Biomedical Lab Techniques I	3		BIO 235	Cell Biology (Req'd, Track 2)	3
	Elective 3	3			Elective 4	3
	Total	**15**			**Total**	**15**

Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3		BIO 485	Micro. Capstone Experience II	3
MAT 610G	Stat. Inference and Modeling	3		BHS 655G	Research Design	2
BIO 660G	Journal Club	1		BIO 660G	Journal Club	1
BIO 625G	**Track Elective I (Advanced Molecular Biology)**	**3**		**BIO 630G**	**Track Elective II (Advanced Cell Biology)**	**3**
BIO 670G	Research Rotation	2			Elective 7	3
	Elective 5	3		**BIO 645G**	**Bacterial Pathogenesis (req'd Track 3)**	**3**
	Elective 6	3				
	Total	**18**			**Total**	**15**

Year 5						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 671G	Ethics in Research	1			Graduate Elective IV	3
	Graduate Elective II	3		BIO 702G	Thesis Research	3
	Graduate Elective III	3				
BIO 660G	Journal Club	1				
BIO 701G	Thesis Research	3				
	Total	**11**			**Total**	**6**

MINOR IN MATH

Mathematics and mathematical abilities are important to all areas of our society. Indeed, mathematics is extensively used throughout all disciplines, including pharmacy and the health sciences. The study of mathematics integrates analytical, problem-solving, and communication skills, and aid the student in applying them towards solving a wide variety of problems using appropriate computational tools. The minor in mathematics is appropriate for all ACPHS students looking to broaden their mathematical horizons.

MINOR IN MATH REQUIRED COURSES

This is an 18-credit minor in mathematics that is open to all students. The required courses are this 3-course sequence in Calculus (11 credits). The remaining credits (7 credits) are chosen from a number of previously approved courses.

To successfully complete this minor, a net minimum GPA of 2.5 must be achieved in minor coursework.

Calculus Sequence: 11 required credits
MAT 111: Calculus or MAT 121 Calculus I (4)
MAT 211: Calculus II (4)
MAT 235: Differential Equations (3) or MAT 380: Topics in Math: Calculus III (3)

Additional Coursework: 7 required credits
7 credits may be selected from the following courses:

MAT 290: Independent Study or Research in Mathematics and Computation (variable credits), ECN 325: Econometrics (3), CHE 345/350: Physical Chemistry I/II, MAT 380: Topics in Mathematics and Computation (variable credits), MAT 490: Independent Study or Research in Mathematics and Computation (variable credits), MAT 610: Statistical Inference and Modeling (3)*, PSC 672: Experimental Design and Data Analysis (2)*, PAD 636: Statistical Programming (3), PAD 693: Epidemiology (3), MAT 235: Differential Equations**, MAT 380: Calculus III**, PBH 210: Introduction to Data, Other 200-level or higher courses containing a significant mathematical or computational component approved by the minor coordinator.

*may not receive credit for both MAT 610 and PSC 672
**if not counted as part of the required Calculus sequence

Students can declare this minor as soon as the semester during which they are enrolled in their first 200-level or higher course towards the minor, and should declare it no later than the end of the add-drop period of the last semester before graduation. It is strongly recommended that students in this minor complete Calculus II by the end of their second year of study. Prior credit transferred to ACPHS at the time of admission may be used to satisfy minor requirements.

MINOR IN MEDICAL HUMANITIES

The Medical Humanities Minor at ACPHS offers students a foundation in methodologies and topics within the Medical Humanities. Complementing their education in the basic and social sciences, students may use elective credits to engage the non-biological aspects of life, health, illness, and healthcare practices using the lenses of the humanities.

MINOR IN MEDICAL HUMANITIES REQUIRED COURSES

Students will take two required to complete a total of 18 credits hours divided between foundational (6 credits) and topics oriented (12 credits) courses. At least 9 credit hours must be at an advanced level (300 or higher).

Foundational Courses: 6 required credits
HUM 220: Medical Humanities (3)
ETH 310: Bioethics (3)

Topics Courses: 12 required credits
12 credits chosen from:

ART 105: Introduction to Drawing (3), ART 215: Figure Drawing (3), ART 220: Museum Experience (3), ETH: 315: Health, Disease, and Authority in Medicine (3), ETH 410: Special Topics in Bioethics (3), ETH 510: Health Care and Human Values (3), HIS 325: History of the Plagues (3), HIS 330: History of Public Health and Medicine (3), HUM 245: Human Rights in the Age of Genocide (3), HUM 285: Culture and Customs of Senegal (3), HUM 386: Culture, Customs, and Health of Belize (3), LIT 220: Suicide and/as Literature: East-West (3), PHI 245: Introduction to Buddhism and Meditation (3), PHI 247: Mindfulness Based Stress Reduction (1), PHI 350 Nature and Wellness (3), PHI 370: Contemplative Studies (3), PHI 380/PSC 380: Brain, Mind, and Meditation (3)

Substitutions: Up to three credits (one course) may be taken in the social sciences, with advance permission of the Chair of Humanities and Communication.

MINOR IN MICROBIOLOGY

The minor in Microbiology is designed to provide a limited but solid foundation in the discipline. The curriculum examines the biology of pathogenic microorganisms with a focus on the fundamental concepts of microbial physiology and genetics. Through the lab associated with its foundational Microbiology course the minor also requires students to develop reasonable expertise in handling and characterizing microorganisms.

MINOR IN MICROBIOLOGY REQUIRED COURSES

The minor is available to students in all degree programs. However, students are advised to discuss their course load and schedules with their program directors and/or faculty advisors. To successfully complete the minor, students must achieve a net minimum GPA of 2.75 in minor coursework. The minor is a collection of three required courses (10 credits) and three elective courses (9 credits) in the discipline. Sufficient room exists within the minor for selection of elective courses at the advanced level that may emphasize a specialty area of the discipline such as Biomedical Microbiology or Epidemiology/Public Health Microbiology.

Required Courses: 10 required credits
BIO 210: Microbiology (4)*
BIO 370: Microbial Physiology (3)
BIO 340: Microbial Genetics (3)

*BSBT students only may substitute CLS 327, CLS 328, CLS 329, and CLS 330 (total of 8 credits) for BIO 210 and an elective (total of 7 credits).

Elective Courses: 9 required credits
9 credits selected from the following courses:

- PSC 315: Immunology (3) or CLS 337: Clinical Immunology (3)
- BIO 240: Virology (3)
- BIO 365: Medical Parasitology and Mycology (3)
- BIO 680G: Bacterial Pathogenesis (3)
- PAD 393: Introduction to Epidemiology (3)
- BIO 315: Public Health Microbiology (3)
- CLS 327: Clinical Microbiology I (3)
- CLS 329: Clinical Microbiology II (3)
- Other courses by approval of the Minor Coordinator.

Students can declare this minor as soon as the semester during which they are enrolled in their first 200-level or higher course towards the minor, and should declare it no later than the end of the add-drop period of the last semester before graduation. Prior credit transferred to ACPHS at the time of admission may be used to satisfy minor requirements.

MINOR IN PUBLIC HEALTH

Public Health is an interdisciplinary field that integrates knowledge and skills from a wide range of academic disciplines to promote the health and safety of communities. The minor in Public Health at ACPHS complements an education in clinical or biomedical sciences by emphasizing the broader socio-cultural, structural, and economic contexts in which individuals and populations experience health and illness. The minor introduces students to the core perspectives and competencies of Public Health, including the central role of research, while retaining flexibility to personalize the program around students' interests and plans.

MINOR IN PUBLIC HEALTH REQUIRED COURSES

Foundations of Public Health: 9 required credits

PBH 120: Intro to Public Health (3)

Two courses (6 credits) [at least one 300-level or above] chosen from SOC 420: Health and Social Policy; SOC 335: Global Health; ETH 310: Bioethics; PBH 220 Environmental Health; PSY 321: Health Psychology; PBH 345: Community Health Practice; COM 3xx Health Promotion; COM 315: Health Campaigns; SOC 350: Disparities and Social Justice; HIS 330: History of Public Health and Medicine; PAD 451: US and Global Health Care Systems; SOC 325: Medical Sociology; additional courses approved by program director

Research Skills: 3 required credits

One additional course chosen from SOC 301: Research Methods; PBH 3xx: Intro to Epidemiology; PBH 340: Survey Research Methods; COM 350: Qualitative Methods; PBH 320: Geography of Health; HRI 645: Epidemiology; PAD 636: Statistical Programming; PBH 210/211: Introduction to Data; Independent Study Research with a Public Health faculty member (prior approval required); additional courses approved by program director

Focused Electives: 6 required credits

Community Engagement: One additional course (3) chosen from COM 315: Health Campaigns; COM 330: Intercultural Communication in Healthcare; HUM 386: Culture, Customs and Health of Belize; HIS 325: History of the Plagues; SOC 330: Cultures of Disability; SOC 350: Disparities and Social Justice; additional courses approved by program director

Health Care Systems: One additional course (3) chosen from ETH 415: Health, Disease, and Authority; PSY 440: Death and Dying; SOC 325: Medical Sociology; HIS 330: History of Public Health and Medicine; PAD 451: US and Global Health Care Systems; COM 320 Patient-Provider Communication; ECN 317 Health Economics; additional courses approved by program director.

BACHELOR OF SCIENCE IN PHARMACEUTICAL SCIENCES

Albany College of Pharmacy and Health Sciences (ACPHS) offers a four year bachelor degree in *Pharmaceutical Sciences*, based on a liberal arts core curriculum designed to foster the development of global citizen scientists. This program challenges students to evolve the critical thinking, communication and leadership skills necessary for self-directed learning and academic independence.

The Pharmaceutical Sciences are focused on the discovery and development of medications which are eventually dispensed by pharmacists and used every day by patients to manage their health. Pharmaceutical Sciences is a broad spectrum discipline encompassing not only basic science knowledge and research skill sets, but also business and marketing expertise. Graduates with an in-depth knowledge of pharmaceutical sciences are in high demand in many health care fields, including the pharmaceutical industry.

PREPARE FOR AN EXCITING CAREER

The Bachelor of Science in Pharmaceutical Sciences (BSPS) program at ACPHS is an excellent launching pad to a wide range of career opportunities and will help set students apart from biology or chemistry majors for a range of positions at pharmaceutical, chemical and biotech companies as well as for graduate, medical, dental and other health and science focused educational pathways. The majority of our graduates have continued on to either medical or graduate education programs (MD, MS, and PhD). Our joint bachelor/master program in pharmaceutical sciences (BS/MSPS) enhances our academic offerings and research focus to allow students to gain both their bachelor and master degree in five years instead of six years.

RESEARCH FOCUSED

Research opportunities provide the foundation for ACPHS's Pharmaceutical Sciences program. Students have many opportunities to be engaged in laboratory-based coursework beginning in their first year, working side-by-side with researchers whose skills have attracted funding from both government and private industry sources. Student research experiences span a wide range of medically-related areas that include cancer, diabetes, chronic kidney disease, addiction and inflammation as well as drug development and drug delivery systems and pharmacokinetics research. The BSPS program now includes an undergraduate Thesis component which includes several courses focused on the science related to the student's research project and the preparation of a written thesis of their work.

PATHWAYS

In recent years, BSPS students have continued their education at graduate, medical schools, physician assistant programs, dental, nurse practitioner programs and law schools. In addition, some have moved directly into the pharmaceutical industry. The combination of classroom instruction and laboratory training in this program is ideal for pursuing opportunities in such fields as Neuroscience, Pharmacology, Drug Discovery and Development, Nanoscale pharmaceuticals and medically related fields that depend on these disciplines.

BACHELOR OF SCIENCE IN PHARMACEUTICAL SCIENCES (BSPS) DEGREE

The Albany College of Pharmacy and Health Sciences' four-year bachelor degree in Pharmaceutical Sciences (BSPS) provides a strong foundation in the basic and pharmaceutical sciences. BSPS graduates will be well-prepared for entrance into basic science graduate programs, business, law, medical, dental, veterinary programs of study as well as related health care programs and entry-level positions in pharmaceutical, chemical and biotechnology industries.

(BSPS) DEGREE PROGRAM OUTCOMES:

1. Ethics and Cultural Awareness

A BSPS student is a positive influence on his/her community, guided by ethical behavior and a sense of responsibility.

- Demonstrates cultural awareness through writings, class discussions and oral presentations
- Expresses informed opinions with consideration for ethics, cultural perspective and empathy

2. Critical Thinking and Analysis

A BSPS student is able to apply critical thinking and scientific analysis to complex problems.

- Synthesizes a broad range of data into coherent hypotheses
- Critically evaluates data
- Applies historical and contemporary knowledge to issues of significance to scientific and non-scientific topics

3. Communication

A BSPS student is an effective communicator in a variety of media.

- Writes creatively and intelligently
- Demonstrates facility in technical writing
- Discusses and presents coherent ideas both didactically and though debate

4. Intellectual Curiosity and Acumen

A BSPS student demonstrates mastery of knowledge in his or her area of concentration, is inquisitive and challenging and academically independent.

- Demonstrates confidence while remaining receptive to alternative ideas
- Has the prerequisite skills to actively participate in independent research within their chosen field Articulates historical, contemporary and cultural perspectives driving their field of interest

5. Leadership

A BSPS student displays leadership

- Through peer mentoring, volunteering and other leadership positions on and off campus, the student will foster curiosity and passion for science in others

- Is well-organized and reliable
- Demonstrates leadership by working with others in a team framework

6. Scientific Reasoning and Application

A BSPS student embodies the principles of scientific reasoning

- Articulates the philosophical foundations of scientific thought
- Formulates hypotheses and tests hypotheses objectively
- Demonstrates knowledge of contemporary standard scientific methodologies
- Employs deductive and inductive reasoning to solve complex problems
- Demonstrates the use of the scientific method as a framework for problem solving

BS IN PHARMACEUTICAL SCIENCES JOINT PROGRAMS AND ARTICULATION AGREEMENTS:

Information regarding joint programs between the BS in Pharmaceutical Sciences Program and other institutions can be found in the Articulation Agreements and Joint Degree Programs section. These include the BSPS/MBA in Healthcare Administration and BSPS/MS in Clinical Leadership in Healthcare Management with Union Graduate College, the BSPS/JD with Albany Law School, the BSPS/MS with ACPHS, and a PA with Albany Medical College.

BS IN PHARMACEUTICAL SCIENCES REQUIRED COURSES

There are currently three concentrations within the BSPS program (Pharmacology, Pharmaceutics, and Pharmaceutical Marketing and Regulatory Science). The required and elective courses for each concentration differs. It is possible for students to complete the requirements for more than one concentration through their elective choices.

REQUIRED COURSES COMMON TO ALL CONCENTRATIONS:

Required courses for all concentrations; other required courses are specific to each concentration and are listed below with each BSPS Concentration.

BIOLOGICAL SCIENCES: 24 REQUIRED CREDITS
General Biology I and II (4,4)
Biochemistry (3)
Molecular Biology (3)
Physiology/Pathophysiology I and II (4,4)
Foundations of Pharmaceutical Science (2)

PHYSICAL SCIENCES AND MATHEMATICS: 31 REQUIRED CREDITS
General Chemistry I and II (4,4)
Organic Chemistry I and II (4,4)
College Physics I and II (4,4)
Elementary Statistics (3)
Calculus I (4)

COMMUNICATIONS AND HUMANITIES: 15 REQUIRED CREDITS
Principles of Communication (3)

The Pre-Modern World, The Modern World, The Contemporary World (3,3,3)
ANY Psychology or Sociology course (3)

INTERDISCIPLINARY: 18 REQUIRED CREDITS
Scientific Reasoning and Analysis 1, 2, 3 (2, 2, 2)
Thesis Research I, II (3, 3)
Thesis 1, 2 (3, 3)

TOTAL REQUIRED COURSES <u>COMMON</u> TO ALL BSPS CONCENTRATIONS: 88 CREDITS

Each BSPS concentration includes additional required and elective courses to fulfill graduation requirements. Elective requirements for each concentration include:

1. Directed Electives: Directed electives are courses selected with the help of an academic advisor that further the student's academic and career goals. These include any non-required science course and non-science courses closely related to the student's academic and career goals.

2. Liberal Arts Electives: Liberal arts electives include art, music, sociology, ethics, history, psychology, anthropology, foreign language, political science, economics and English.

3. General Education Electives: General education electives are any courses that are not required in the standard curriculum.

CONCENTRATION SPECIFIC REQUIRED AND ELECTIVE COURSES:

BSPS PHARMACOLOGY CONCENTRATION:

BIOLOGICAL SCIENCES: 14 REQUIRED CREDITS
Infectious Disease Pharmacology (2)
Neuropharmacology (3)
Cardiovascular Pharmacology (3)
Pharmacology/Physiology Selective (3, 3)

ELECTIVE REQUIREMENTS: 21 MINIMUM CREDITS
Directed Electives: 6 minimum credits
General Education Electives: 15 minimum credits (9 of these 15 credits must be in the Humanities)

Total required course credits:	102 credits
Total elective course credits:	21 credits
TOTAL GRADUATION CREDITS:	**123-135 CREDITS**

SAMPLE BSPS CURRICULUM - PHARMACOLOGY CONCENTRATION

	Year 1					
	Fall Semester	Credits			Spring Semester	Credits
BIO101	General Biology I	4		BIO102	General Biology II	4
CHE101	General Chemistry I	4		CHE102	General Chemistry II	4
				MAT145	Elementary Statistics	3
HUM110	The Pre-Modern World	3		HUM120	The Modern World	3
PSC110	Scientific Reasoning and Analysis I: The Educated Scientist	2		PSC111	Scientific Reasoning and Analysis II: The Ethical Scientist	2
COM115	Principles of Communication	3				
	Total	16			Total	16

	Year 2					
	Fall Semester	Credits			Spring Semester	Credits
CHE211	Organic Chemistry I	4		CHE221	Organic Chemistry II	4
PHY212	College Physics I	4		PHY222	College Physics II	4
HUM210	The Contemporary World	3			Directed Elective/Elective	3
MAT121	Calculus I	4		PSC112	Scientific Reasoning and Analysis III: The Scientist in Society	2
	Total	15			Total	13

	Year 3					
	Fall Semester	Credits			Spring Semester	Credits
PSC311	Biochemistry	3		PSC312	Molecular Biology	3
PSC321	Physiology/Pathophysiology I	4		PSC322	Physiology/Pathophysiology II	4
PSC410	Thesis 1	3				
	Directed Elective/Elective	3		PSC412	Thesis Research I	3
	Sociology OR Psychology course	3			Directed Elective/Elective	3
					Directed Elective/Elective	3
	Total	16			Total	16

	Year 4					
	Fall Semester	Credits			Spring Semester	Credits
PSC431	Foundations of Pharm. Science	2		PSC433	Neuropharmacology	3
				PSC434	Cardiovascular Pharmacology	3
PSC432	Infectious Disease Pharmacology I	2		PSC411	Thesis 2	3
Various	Pharmacology/Physiology Selective	3			Directed Elective/Elective	3
PSC413	Thesis Research II	3			Pharmacology/Physiology Selective	3
	Directed Elective/Elective	3				
	Directed Elective/Elective	3				
	Total	16			Total	15

BSPS PHARMACEUTICS CONCENTRATION:

PHYSICAL SCIENCES AND MATHEMATICS: 13 REQUIRED CREDITS
Pharmaceutics I and II (3,3)
Pharmacokinetics (3)
Calculus II (4)

ELECTIVE REQUIREMENTS: 18 MINIMUM CREDITS
Directed Electives: 6 minimum credits
General Education Electives: 12 minimum credits (9 of these 12 credits must be in the Humanities)

Total required course credits: 107 credits
Total elective course credits: 18 credits
TOTAL GRADUATION CREDITS: 125-135 CREDITS

SAMPLE BS IN PS CURRICULUM – PHARMACEUTICS CONCENTRATION

	Year 1					
	Fall Semester	Credits			Spring Semester	Credits
BIO101	General Biology I	4		BIO102	General Biology II	4
CHE101	General Chemistry I	4		CHE102	General Chemistry II	4
				MAT145	Elementary Statistics	3
HUM110	The Pre-Modern World	3		HUM120	The Modern World	3
COM115	Principles of Communication	3		PSC111	Scientific Reasoning and Analysis II: The Ethical Scientist	2
PSC110	Scientific Reasoning and Analysis I: The Educated Scientist	2				
	Total	16			Total	16

	Year 2					
	Fall Semester	Credits			Spring Semester	Credits
CHE211	Organic Chemistry I	4		CHE221	Organic Chemistry II	4
PHY212	College Physics I	4		PHY222	College Physics II	4
HUM210	The Contemporary World	3		MAT211	Calculus II	4
MAT121	Calculus I	4		PSC112	Scientific Reasoning and Analysis III: The Scientist in Society	2
	Total	15			Total	14

	Year 3					
	Fall Semester	Credits			Spring Semester	Credits
PSC311	Biochemistry	3		PSC312	Molecular Biology	3
PSC321	Physiology/Pathophysiology I	4		PSC322	Physiology/Pathophysiology II	4
PSC341	Pharmaceutics I	3		PSC342	Pharmaceutics II	3
PSC410	Thesis 1	3		PSC412	Thesis Research I	3
	Psychology OR Sociology course	3			Directed Elective/Elective	3
	Total	16			Total	16

	Year 4					
	Fall Semester	Credits			Spring Semester	Credits
PSC431	Foundations of Pharm. Science	2		PSC411	Thesis 2	3
					Pharmaceutics Selective	3
PSC441	Pharmacokinetics	3			Directed Elective/Elective	3
PSC413	Thesis Research II	3			Directed Elective/Elective	3
	Pharmaceutics Selective	3			Directed Elective/Elective	3
	Directed Elective/Elective	3				
	Directed Elective/Elective	3				
	Total	17			Total	15

BSPS PHARMACEUTICAL MARKETING AND REGULATORY SCIENCE CONCENTRATION:

PHYSICAL SCIENCES: 6 REQUIRED CREDITS
Pharmaceutics I (3)
Pharmaceutics II (3)
Business, Management and Healthcare: ***15 Required Credit Hours***
Regulatory Sciences (3)
Health Economics (3)
Principles of Management (3)
US and Global Healthcare Systems (3)
Introduction to Sales and Marketing in the Pharmaceutical Industry (3)

Elective Requirements
Elective Course Requirements: ***15 Minimum Credit Hours***
Directed Electives: 6 Minimum Credit Hours
General Education Electives: 9 Minimum Credit Hours (*9 of these must be in the Humanities*)

Total Required Course Credits (including Core Courses): 109 Credit Hours
Total Required Elective Course Credits: 15 Credit Hours (Minimum)

Total Credits Required for Graduation: 124-135 Credit Hours

SAMPLE BS IN PHARMACEUTICAL SCIENCES CURRICULUM – PHARMACEUTICS CONCENTRATION

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 101	General Biology I	4		BIO 102	General Biology II	4
CHE 101	General Chemistry I	4		CHE 102	General Chemistry II	4
HUM 110	The Pre-Modern World	3		MAT 145	Elementary Statistics	3
COM 115	Principles of Communication	3		HUM 120	The Modern World	3
PSC 110	Scientific Reasoning and Analysis I: The Educated Scientist	2		PSC 111	Scientific Reasoning and Analysis II: The Ethical Scientist	2
	Total Credit Hours	**16**			**Total Credit Hours**	**16**
Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4		CHE 221	Organic Chemistry II	4
PHY 212	College Physics I	4		PHY 222	College Physics II	4
HUM 210	The Contemporary World	3		ECN 317	Health Economics	3
MAT 121	Calculus I	4		PSC 410	Thesis I	3
				PSC 112	Scientific Reasoning and Analysis III: The Scientist in Society	2
	Total Credit Hours	**15**			**Total Credit Hours**	**16**
Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 311	Biochemistry	3		PSC3 12	Molecular Biology	3
PSC 321	Physiology / Pathophysiology I	4		PSC 322	Physiology / Pathophysiology II	4
PSC 341	Pharmaceutics I	3		PSC 342	Pharmaceutics II	3
PSC412	Thesis Research I	3		PAD 317	Principles of Management	3
TBD	Sociology/Psychology Selective	3		PSC413	Thesis Research II	3
	Total Credit Hours	**16**			**Total Credit Hours**	**16**
Year 4						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 431	Foundations of Pharmaceutical Sciences	2		PSC 312	Regulatory Science	3
PSC 411	Thesis II	3		PAD 351	Introduction to Sales and Marketing in the Pharmaceutical Industry	3
PAD 415	US and Global Healthcare Systems	3		TBD	Directed Elective/Elective	3
TBD	Directed Elective/Elective	3		TBD	Directed Elective/Elective	3
TBD	Directed Elective/Elective	3		TBD	Directed Elective/Elective	3
	Total Credit Hours	**14**			**Total Credit Hours**	**15**

BACHELOR OF SCIENCE TRANSFER STUDENTS

IMPORTANT DEADLINES FOR TRANSFER APPLICANTS:

DECEMBER 1
Admissions Priority Deadline for Spring Semester Entry

FEBRUARY 1
Free application for Federal Student Aid (FAFSA) Due

MAY 1
Admissions Priority Deadline for Fall Semester Entry

INSTRUCTIONS FOR BACHELOR OF SCIENCE TRANSFER STUDENTS

To ensure full consideration and place in the incoming class, it is highly recommended that the completed application be submitted by the priority deadlines for spring and fall entry. Applications for transfer admission into the second or third year of the Bachelor of Science programs will be accepted from students who have completed or plan to complete the required coursework, as long as space is available.

An application form must be completed and submitted to the College along with the required $75 *non-refundable* application fee. The following materials also must be sent to the Office of Admissions:

- List of courses in progress and/or planned
- Official transcript from high school and each college attended
- One (1) letter of recommendation from a science teacher

Applicants who have studied for fewer than 10 years where English is the language of instruction are required to submit scores from the Test of English as a Foreign Language (TOEFL) or the Test of Spoken English (TSE). A minimum score on the TOEFL of 474 paper-based (70% of the maximum score of 677), or 84 Internet-based (70% of the maximum score of 120); and a minimum of 50 on the TSE must be achieved to be considered for admission.

Once a student is notified of acceptance, a non-refundable deposit of $400, along with the signed Enrollment Confirmation Form, will be required to reserve a place in the incoming class as long as space remains available. In the event that enrollment exceeds capacity, ACPHS reserves the right to return the admissions deposit on the date received. Failure to submit a final transcript and all required forms may result in the withdrawal of a student's acceptance. The College reserves the right to use a wait list for qualified students.

REQUIRED COURSEWORK FOR 2ND YEAR TRANSFER STUDENTS INTO THE BACHELOR OF SCIENCE IN PHARMACEUTICAL SCIENCES PROGRAM:

General Biology	8 semester hours
General Chemistry	8 semester hours
Statistics	3 semester hours
English	6 semester hours
Liberal Arts electives	6 semester hours

REQUIRED COURSEWORK FOR 3RD YEAR TRANSFER STUDENTS INTO THE BACHELOR OF SCIENCE IN PHARMACEUTICAL SCIENCES PROGRAM:

General Biology	8 semester hours
General Chemistry	8 semester hours
Organic Chemistry	8 semester hours
General Physics	8 semester hours
Calculus I or Calculus I & II *	4 or 8 semester hours
Statistics	3 semester hours
English	9 semester hours
Directed elective	9 semester hours
Liberal Arts electives	6 semester hours

***** Depends on the concentration

Liberal Arts electives include art, music, sociology, history, ethics, psychology, anthropology, foreign language, political science, economics and English. Other electives include any course that is not required in the standard curriculum list above.

Directed electives are courses selected with the help of an academic advisor that furthers the student's career goals. Directed electives include any non-required science courses or non-science courses closely related to the student's academic and career goals. Examples of such courses include Cell Biology, Immunology, US and Global Health Care, Pharmacoeconomics, and others.

No credit will be accepted for grades lower then "C" (C- is not acceptable) or for physical education courses. Pass/Fail credits will be granted only for first-year courses and/or liberal arts electives. ACPHS reserves the right to refuse the transfer of any previously earned college credits.

EARLY ASSURANCE PRE-PHARMACY

Albany College of Pharmacy and Health Sciences offers a 6 year curriculum (2-year pre-pharmacy and 4-year professional) leading to a Doctor of Pharmacy (PharmD) degree and eligibility for licensure within the profession. Students may enter the pre-pharmacy years through the College's early assurance program which guarantees admission into the first professional year (P1) provided all progression requirements are met (see the catalog section, Progression Requirements for Admission in the PharmD Program for details).

External students may transfer into the pre-pharmacy portion of the program under the early assurance route of entry if seats are available. Early assurance students who progress into P1 may opt to complete the four professional years on the Albany or Vermont campus.

EARLY ASSURANCE REQUIRED COURSES

Natural Sciences: 38 required credits
CHE 111 and 121: General Chemistry I and II (4, 4)
CHE 211 and 221: Organic Chemistry I and II (4, 4)
PHY 245: Physics for Life Sciences (4)[1]
BIO 111 and BIO 121: General Biology I and II (4, 4)
BIO 210: Microbiology (4)
6 credits of 200 level or higher science selectives[2] chosen from the following. At least one course must have a BHS or BIO prefix: BIO 235: Cell Biology (3), BIO 213: Anatomy and Physiology I (3), BIO 215: Anatomy and Physiology II (3), BIO 225: Genetics (3), BIO 240: Virology (3), BIO 245: Biological Basis of Disease (3), BIO 365: Parasitology (3), BHS 360: Clinical Anatomy (3), PBH 350: Epidemiology (3), and MAT 211: Calculus II (3). Other courses may be counted with the permission of the Program Co-Directors.

Humanities, Social Science, and Communication: 15 required credits[3]
HUM 101, 102 and 201: The Pre-Modern World (3), The Modern World (3), The Contemporary World (3)
PSY 101: Psychology (3)
COM 115: Principles of Communication (3)

Mathematics: 7 required credits
MAT 111: Calculus (4)[4]
MAT 145: Elementary Statistics (3)

Electives: Minimum of 9 credits[5]
9-12 credits of electives
At least 6 of the 9 required elective credits must be liberal arts credits.

TOTAL CREDITS: 69 CREDITS

[1]Students may elect to take PHY 212: College Physics I (4) and PHY 222: College Physics II (4) in place of PHY 245: Physics for Life Sciences (4) and a Science Selective (3). A student successfully completing PHY 212 must also take PHY 222 to meet progression requirements for admission into the PharmD Program.
[2]For the purposes of applying transfer credit and remediation policies, Science Selectives are considered required courses.
[3]All incoming students are assessed for their writing ability. The assessment is designed to direct students to the courses for which they are best prepared in the first year of the curriculum (COM 101 or COM 115).
[4]Calculus I and II may be substituted for Calculus with 4 credits counting toward Science Selective hours.
[5]Students completing the PharmD program have additional elective requirements that include a total minimum of 9 elective liberal arts credits. Students may register for an additional 3 credits during the pre-pharmacy years to satisfy the 3 non-professional elective credits designated during the P1-P3 years. See the Required Courses for the PharmD Program section of the catalog for details.

DOCTOR OF PHARMACY: REQUIRED COURSES IN P1-P4

BIOLOGICAL SCIENCES: 17 REQUIRED CREDITS
PSC 311 Biochemistry (3)
PSC 312 Molecular Biology (3)
PSC 315 Immunology (3)
PSC 321; PSC 322 Physiology/Pathophysiology I and II (4,4)

PHARMACEUTICAL SCIENCES: 14 REQUIRED CREDITS
PSC 341; PSC 342 Pharmaceutics I and II (3,3)
PSC 369 Molecular Foundations of Drug Action (3)
PSC 370 Pharmacogenomics (2) PSC 441 Pharmacokinetics (3)

CLINICAL SCIENCES AND PHARMACY PRACTICE: 52 REQUIRED CREDITS
PHM 318 Foundations of Pharmacy (1)
IPS 301, 302, 401, 402, 501, 502 Integrated Problem-Solving Workshops I-VI (7 credits total)
PHM 329 Self-care & Over-the-Counter Medicines (3)
PTP 410, 425, 431, 440, 446, 515, 525, 528, 549 Pathophysiology, Therapeutics, Pharmacology, and Medicinal Chemistry modules (24 credits total)
PSL 331, 332, 431, 432, 531, 532 Pharmacy Skills I-VI (11 credits total)
PHD 410 Drug Information and Biostatistics (2)
PSC 451 Scientific Literature Evaluation (1)
PAD 510 or PAD 511 Jurisprudence (3)
PHM 911 Orientation to Advanced Pharmacy Practice Experiences (0)

ADMINISTRATIVE AND SOCIAL SCIENCES: 9 REQUIRED CREDITS
PAD 451 US and Global Healthcare Systems (3)
PAD 515 Pharmacoeconomics and Health Policy (3)
PAD 521 Pharmacy Administration (3)

HUMANITIES, CULTURE HEALTH, AND ETHICS: 3 REQUIRED CREDITS
ETH 510 Healthcare and Human Values (3)

EXPERIENTIAL EDUCATION: 50 CREDITS
CLK 798 Community Pharmacy Introductory Pharmacy Practice Experience (4)
CLK 803 Team Based Care Introductory Pharmacy Practice Experience (1)
CLK 807 Institutional Pharmacy Introductory Pharmacy Practice Experience (3)
CLK 811+ Advanced Pharmacy Practice Experiences (42 credits total)

ELECTIVE CREDIT GRADUATION REQUIREMENTS:
Total of 18 elective credits required to graduate

- Minimum of 6 credits must be designated as Professional Elective Credit and taken during the PharmD program years (P1-P3)
- Minimum of 9 credits must be designated as Liberal Arts Elective Credit*

*Some professional electives may also satisfy the Liberal Arts Elective Credit designation.

TOTAL CREDITS: 167 CREDITS 145 required + 6 professional elective

DOCTOR OF PHARMACY PROGRAM OUTCOMES

DOMAIN 1 – FOUNDATIONAL KNOWLEDGE

1.1. Learner (LEARNER) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., ***pharmaceutical, social/behavioral/administrative***, and ***clinical sciences***) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and ***patient centered care***.

DOMAIN 2 – ESSENTIALS FOR PRACTICE AND CARE

2.1. Patient-centered care (CAREGIVER) - Provide ***patient-centered care*** as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

2.2. Medication use systems management (MANAGER) - Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

2.3. Health and wellness (PROMOTER) - Design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness.

2.4. Population-based care (PROVIDER) - Describe how ***population-based care*** influences ***patient centered care*** and influences the development of practice guidelines and evidence-based best practices.

DOMAIN 3 - APPROACH TO PRACTICE AND CARE

3.1. Problem Solving (PROBLEM SOLVER) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

3.2. Educator (EDUCATOR) – Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding.

3.3. Patient Advocacy (ADVOCATE) - Assure that patients' best interests are represented.

3.4. Interprofessional collaboration (COLLABORATOR) – Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs.

3.5. Cultural sensitivity (INCLUDER) - Recognize ***social determinants of health*** to diminish disparities and inequities in access to quality care.

3.6. Communication (COMMUNICATOR) – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.

DOMAIN 4 – PERSONAL AND PROFESSIONAL DEVELOPMENT

4.1. Self-awareness (SELF-AWARE) – Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth.

4.2. Leadership (LEADER) - Demonstrate responsibility for creating and achieving shared goals, regardless of position.

4.3. Innovation and Entrepreneurship (INNOVATOR) - Engage in innovative activities by using creative thinking to envision better ways of accomplishing professional goals.

4.4. Professionalism (PROFESSIONAL) - Exhibit behaviors and values that are consistent with the trust given to the profession by patients, other healthcare providers, and society.

INTERPROFESSIONAL EDUCATION

Pharmacists are integral members of the healthcare team. As such, an important aspect of student pharmacists' education includes Interprofessional education, which has been defined as occurring when students of two or more health professions learn from, with and about each other. The School of Pharmacy and Pharmaceutical Sciences of ACPHS has adopted the following Vision and Mission statements for Interprofessional Education.

Vision: ACPHS will graduate pharmacists who actively collaborate with other health professionals to provide and promote patient-centered care.

Mission: The mission of IPE at ACPHS is to provide every student multiple opportunities to learn about, from and with other health professions. Through these experiences, students will develop competencies approved by the PCC, in each of the four recognized IPE domains. Through local and regional affiliations, our students and faculty will provide leadership to build stronger healthcare teams and thus improve the care of their patients.

DOCTOR OF PHARMACY PROFESSIONAL CURRICULAR GRID

Professional Year 1 (P1)					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PSC 341	Pharmaceutics I	3	PSC 342	Pharmaceutics II	3
PSC 321	Physiology/Pathophysiology I	4	PSC 322	Physiology/Pathophysiology II	4
CHE 311 or PSC 311	Biochemistry	3	PSC 312	Molecular Biology	3
PSC 315	Immunology	3	PHM 329	Self Care/OTC	3
PHM 318	Foundations of Pharmacy	1	PSL 332	Pharmacy Skills II	2
PSL 331	Pharmacy Skills I	2	IPS 302	Integrated Problem Solving Workshop II	1
IPS 301	Integrated Problem Solving Workshop I	1	PSC 369	Molecular Foundations of Drug Action I	3
	Total	17		**Total**	19

Introductory Pharmacy Practice Experience - Summer after P1 year
CLK 798 Community (4 credits)

Professional Year 2 (P2)					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PSC 370	Pharmacogenomics	2	PTP 425	PTP&M – Endocrine	2
PSC 441	Pharmacokinetics	3	PTP 431	PTP&M – GI/Nutrition	2
PTP 440	PTP&M – Cardiovascular	4	PTP 446	PTP&M – Infectious Disease	4
PTP 410	PTP&M – Respiratory Disease	1	PAD 451	US and Global Health Care Systems	3
PHD 410	Drug Information/Biostatistics	2	IPS 402	Integrated Problem Solving Workshop IV	1
IPS 401	Integrated Problem Solving Workshop III	1	PSL 432	Pharmacy Skills IV	2
PSL 431	Pharmacy Skills III	2	PSC 451	Scientific Literature Evaluation [b]	1
PSC 451	Scientific Literature Evaluation [b]	1		Professional Elective [a]	3
	Professional Elective [a]	3			
	Total	15-19		**Total**	14-18

Introductory Pharmacy Practice Experience - Summer after P2 year
CLK 807 Institutional (3 credits)
CLK 803 Team Based Care (1 credit)

DOCTOR OF PHARMACY PROFESSIONAL CURRICULAR GRID (Continued)

Professional Year 3 (P3)					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PTP 525	PTP&M – Nephrology/Toxicology	2	PTP 515	PTP&M Rheumatology/Oncology	3
PTP 528	PTP&M – Genitourinary	2	PAD 510 or PAD 511	Jurisprudence	3
PTP 549	PTP&M – Neurology/Psychology	4	ETH 510	Health Care and Human Values	3
IPS 501	Integrated Problem Solving Workshop V	1	PAD 521	Pharmacy Administration	3
PAD 515	Pharmacoeconomics and Health Policy	3	IPS 502	Integrated Problem Solving Workshop VI	2
PSL 531	Pharmacy Skills V	2	PSL 532	Pharmacy Skills VI	1
PHM 911	Orientation to APPE	No credit		Professional Elective [a]	3
	Professional Elective [a]	3			
	Total	14-17		**Total**	15-18

Professional Year 4 (P4) **Advanced Pharmacy Practice Experiences (42 credits) - Summer, Fall and Spring Semesters**		
CLK 929	Community Core Rotation	6
CLK 843 or CLK 930	Institutional Core Rotation	6
CLK 812 – CLK 999	Inpatient Core Rotation	6
CLK 812 – CLK 999	Ambulatory Care Core Rotation	6
	Flexible Core Rotation	6
	Elective	6
	Elective	6
	Total	42

PTPM – Pathophysiology, Therapeutics, Pharmacology, and Medicinal Chemistry

[a] Professional electives can be taken any semester
[b] Students take once in the fall or spring

Updated Spring 2019

INTRODUCTORY PHARMACY PRACTICE EXPERIENCES (IPPES)

IPPEs are designed for pharmacy students in their first three professional years of the Pharm.D. program. By the time they enter their final professional year, students will have gained 320 hours of "hands-on" practice experiences by meeting the IPPE requirements detailed below.

Each pharmacy student is required to complete three (3) rotations which total eight (8) credits and 320 hours. All IPPE requirements must be met prior to beginning APPEs.

Community Pharmacy IPPE (four weeks)
Under the direct supervision of a registered pharmacist, students will demonstrate proficiencies in a skill set that includes: dispensing prescriptions, utilizing patient profiles, monitoring drug interactions, pharmacy operations, and basic communication with patients and physicians. This IPPE is scheduled following the first professional year (P1).

Institutional IPPE (three weeks)
This course is designed to introduce students to hospital pharmacy practice. Students will be introduced to distributive and clinical functions including review and evaluation of medication orders, identification and resolution of medication related problems, interactions with non-pharmacy departments, observation of the order entry process and preparation of sterile products, performing patient-specific calculations necessary for dosing medications, and presenting a patient case or disease topic. This IPPE is scheduled in the summer following the second professional year (P2).

Team-Based Care IPPE (one week)
Formerly titled the Patient Assessment IPPE, this course will expose students to the basic day-to-day operations of an outpatient care setting. Students will gather and organize information from patient medical charts, conduct patient interviews to obtain an accurate medication history, present a patient case in a structured format (e.g., SOAP note), and prepare responses to drug information inquiries. This IPPE is scheduled in the summer following the second professional year (P2).

ADVANCED PHARMACY PRACTICE EXPERIENCES (APPES)

APPEs are "hands-on" experiences (called rotations) designed to build upon the academic base obtained in the classrooms, laboratories, and IPPE portions of the Pharm.D. program.

APPEs are subdivided into modules. They begin each May and continue through May of the following year. One week of an APPE is equal to one semester hour of academic credit.

Each student is required to complete 42 weeks (42 credits). APPEs are scheduled by the College and typically require the student to be at the practice site at least eight hours daily.

Each student must successfully complete five (5) core rotations and two (2) elective rotations.

Required Core APPEs

Students must complete each of these rotations for a total of 30 credits. All required core rotations must be completed in the United States (in accordance with ACPE Standard 14.5).

1. Community Pharmacy (six weeks)
2. Ambulatory Care (six weeks) *
3. Institutional Pharmacy Operations (six weeks)
4. Inpatient Care (six weeks) *
5. Flexible Core (six weeks) - Students select a second rotation from core categories 1-4 as listed above.

* Inpatient Care and Ambulatory Care rotations are direct patient care rotations in settings including but not limited to: anticoagulation; critical care; diabetes/endocrinology; emergency medicine/toxicology; family practice; gastroenterology; geriatrics; hematology/oncology; HIV pharmacotherapy; homecare; infectious diseases; internal medicine; nephrology; neurology; nutrition; pain management; pediatrics; primary care; and psychiatry.

Elective APPEs

Students must choose two elective rotations from the below categories to complete their APPE requirements. Each rotation is six weeks in length and six (6) academic credits. Elective APPEs may be completed outside of the U.S.

Elective options include: Compounding; Drug Programs Management; Governmental Affairs/Regulatory; Health Information Management; Home Infusion Pharmacotherapy; International Pharmacy; Long-term Care; Medication Safety; Military Pharmacy; Nuclear Pharmacy; Pharmaceutical Industry; Pharmacogenomics; Pharmacy Administration; Pharmacy Association Management; Pharmacy Education and Research, and many others.

Non-Academic Requirements for IPPEs and APPEs

Prior to IPPEs, students must register as a pharmacy intern in the state that the rotation will be performed.

Prior to APPEs, students must have successfully completed their IPPE requirements.

Prior to IPPEs and APPEs, students must have the following:

- A copy of personal immunization records, which will be on file at the College (in the event a site requests to see them).
- Proof of a recent physical exam (recommended to be performed approximately two weeks prior to the start of rotations, so that it remains valid through the duration of APPEs) - Students will be provided with appropriate forms to complete.
- Tuberculosis Screening test (PPD skin test or IGRA blood test) - Students must provide medical documentation showing results of a negative TB skin or blood test, or chest x-ray report following a positive test result. The Division of Experiential Education will provide further details closer to APPEs.
- CPR or Basic Life Support Certification, valid for the duration of APPE rotations
- Seasonal influenza (flu) vaccination

Some clinical sites may have their own requirements as well, including a criminal background check, an antibody titer (laboratory blood test, which indicates proof of immunity, as opposed to providing proof of having received the vaccine), etc.

Specific requirements, if any, would be noted in the rotation site's record within the CoreELMS database, and would be communicated to the appropriate students via email in advance of the rotation by Experiential Education staff.

Institutions hosting experiential education rotations may deny a student's participation in the experiential program because of the inability to produce an appropriate health clearance, which could result in delayed graduation or in the inability to graduate from the program.

NOTICE OF BACKGROUND CHECK

Individuals who have been convicted of a felony or misdemeanor may be denied certification or licensure as a health professional. Information regarding eligibility for licensing in a particular jurisdiction may be obtained from the appropriate credentialing body of that jurisdiction.

Rotation sites may deny a student's participation in the experiential program because of a felony or misdemeanor conviction, failure of a required drug test, or inability to produce an appropriate health clearance, which would result in delayed graduation or in the inability to graduate from the program.

Because institutions hosting experiential education may require a criminal background check in order to permit students in their facility, the College will conduct background checks on all students entering clerkship, using the Health and Human Services/Office of Inspector General (HHS OIG) database.

The goal of the HHS OIG background check web site is to identify individuals and businesses excluded from Federally funded health care programs. This includes individuals convicted of fraud related to the federal programs, patient abuse, licensing board actions and default on health education assistance loans.

If a student is identified via use of this database, the matter is referred to a Committee appointed by the School of Pharmacy and Pharmaceutical Sciences of ACPHS for action.

EARLY ASSURANCE SAMPLE SCHEDULE

Students whose writing skill development is appropriate for COM 115: Principles of Communication will take the following first year schedule of courses.

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 111	General Biology I	4		BIO 121	General Biology II	4
CHE 111	General Chemistry I	4		CHE 121	General Chemistry II	4
MAT 111	Calculus*	4		COM 115	Principles of Communication*	3
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
PSY 101	Psychology	3			Elective	3
	Total	**18**			**Total**	**17**

*Some students take these course in the alternate semester.

Students needing writing skill development additionally take COM 101: Academic Reading and Writing and will have the following first year schedule of courses.

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 111	General Biology I	4		BIO 121	General Biology II	4
CHE 111	General Chemistry I	4		CHE 121	General Chemistry II	4
COM 101	Academic Reading and Writing	3		COM 115	Principles of Communication	3
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
PSY 101	Psychology	3		MAT 111	Calculus	4
	Total	**17**			**Total**	**18**

Students take one of the following second year schedules.

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4		CHE 221	Organic Chemistry II	4
HUM 201	The Contemporary World	3		MAT 145	Elementary Statistics	3
PHY 245	Physics for Life Sciences	4			Science Selective	3
BIO 210	Microbiology	4			Science Selective	3
	Elective	3			Elective	3
	Total	**18**			**Total**	**16**

Or

Year 2						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4		CHE 221	Organic Chemistry II	4
HUM 201	The Contemporary World	3		MAT 145	Elementary Statistics	3
	Science Selective	3		PHY 245	Physics for Life Sciences	4
BIO 210	Microbiology	4			Science Selective	3
	Elective	3			Elective	3
	Total	**18**			**Total**	**16**

Academics

Master's Programs

Health Outcomes and Informatics

Molecular Biosciences

Pharmaceutical Sciences

Clinical Laboratory Sciences

Cytotechnology & Molecular Cytology

MS, CLINICAL LABORATORY SCIENCES (MSCLS)

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Course Name**	**Credits**		**Code**	**Course Name**	**Credits**
CLS 610	Clinical Microbiology I	4		CLS 660	Immunohematology	4
CLS 655	Urinalysis and Body Fluids	2		CLS 640	Clinical Chemistry	4
CLS 650	Clinical Hematology and Hemostasis	4		CLS 620	Clinical Microbiology II	4
ETH 610	Ethics in Resarch	1		BIO 650	Research Design	2
PSC 672	Experimental Design and Data Analysis	2		CLS 630	Clinical Immunology	4
Total Credits		**13**		**Total Credits**		**18**
YEAR 2 FALL				**YEAR 2 SPRING**		
Code	**Course Name**	**Credits**		**Code**	**Course Name**	**Credits**
CLS 770	Clinical Practicum I	9		CLS 780	Clinical Practicum II	9
BHS 740	Genetics/Molecular Basis of Disease	4		BHS 745	Molecular Diagnostics	3
BHS 730	Advanced Good Laboratory Practices and Lab Mgmt	3		CLS 760	Clinical Correlations	3
				BHS 790	Capstone	3
Total Credits		**16**		**Total Credits**		**18**

Year 1 - Fall

Clinical Microbiology I (CLS 610)
This course will focus on the study of aerobic bacteria. The diagnostic techniques involved in identifying the organisms, the significance of different organisms in various clinical specimens, the presentation of microbial disease states and the application of principles of infection control will be presented. The student will be familiarized with the methods used for transport, processing, identification and reporting of bacteria from specimens taken from the human body. Students will analyze and record laboratory data, comply with all safety procedures and learn to determine drug susceptibility, drug resistance and identify sources of infection. (4 credits)

Urinalysis and Body Fluids (CLS 655)
This course includes the medical biochemistry of renal function and the interpretation of urinalysis and body fluid (spinal fluid, seminal fluid, and other body fluids) testing. Emphasis is on clinical significance and interpretation of laboratory results, specimen collection and preservation, biochemical test procedures, clinical microscopy and cytology of urine sediment. (2 credits)

Clinical Hematology and Hemostasis (CLS 650)
This course will address the evaluation of blood cells and body fluids in the clinical hematology laboratory. The lecture and laboratory will highlight physiology, pathophysiology and laboratory testing of blood and bone marrow cells, evaluation of hemostasis and hemostatic disorders and the laboratory evaluation of formed elements found in other body fluids. (4 credits)

Ethics in Research (ETH 610)
This course includes a discussion format based on ethical issues involved in the research process. Students will have focused reading on the ethical issues involved in research and then will apply the readings to case studies during discussion. Topics covered will include, but are not limited to: morality and research ethics, ethical issues before research committees, ethical issues involving human and animal subjects, reporting of research and conflict of interest. (1 credit)

Experimental Design and Data Analysis (PSC 672)
This course is required for all Pharmaceutical Sciences graduate students and provides students with a basic knowledge of experimental design and biostatistics. Students will learn how to design experiments and analyze the results. The course will cover single factor experiments, multiple factors, full factorial and fractional factorial designs and screening designs, the fundamentals of hypothesis testing and relevant biostatistics. (2 credits)

Year 1 - Spring

Immunohematology (CLS 660)
Immunohematology is the laboratory application of immunologic principles to the identification of appropriate blood and blood products for transfusion and body tissues for transplant. The course will cover characteristics of red cell and white cell specific antigens, donor qualification and blood processing as well as the techniques for identification of auto- and allo-antibodies important to transfusion medicine and transfusion service specific regulations and quality control requirements. (4 credits)

Clinical Chemistry (CLS 640)
This combined lecture/laboratory course focuses on basic concepts of laboratory instrumentation, troubleshooting techniques and the operation, evaluation and selection of instruments. Lectures emphasize chemical measurements of physiologic indicators of normal and abnormal human metabolism and address the elements of clinical chemistry and its application to diagnosis and treatment of patients. The significance of lipids, carbohydrates, proteins, enzymatic measurements, acid-base balance as they apply to diagnoses of cardiovascular, pulmonary, renal and metabolic diseases is emphasized through hands-on measurement and correlation with pathophysiology. (3 credits)

Clinical Microbiology II (CLS 620)
This course follows similar principles as CLS550, but will focus on the study of medically relevant parasites and fungi. Students will also learn key aspects of mycological, and anaerobic infections. By participating in both classes CLS550 and CLS560 students will become proficient in traditional microbiology, as well as contemporary immune- and molecular-based identification technology. (4 credits)

Research Design (BIO 650)
This graduate-level course will introduce students to the research methods used in the biological sciences. Topics to be covered include research design, data collection and documentation, critical literature review, preparation of a NIH-style grant application, and academic presentations and publications. Class discussions, workshops, and writing assignments will provide students with opportunities to both practice learned research methods as well as apply these methods toward the design of a potential thesis research project. (2 credits)

Clinical Immunology (CLS 630)
The content of this course includes development of the immune system, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, and immune responses to infections organisms and tumors. The lecture and laboratory will focus on diagnostic techniques employed in the identification of viral and bacterial diseases and the diagnosis of autoimmune diseases, allergies, immune deficiencies and AIDS. (4 credits)

Year 2 - Fall

Clinical Practicum I (CLS 770)
Students will participate in a number of experiential exercises in the affiliated hospital and laboratory sites. Rotations will include Clinical Microbiology, Clinical Chemistry, Immunohematology, Hematology and Coagulation, Immunology/Serology and Molecular Diagnostic testing. The clinical practicum experience will include specimen tracking, performance of routine analyses, demonstration of specialty testing, observation of automated instrumentation and management processes, including quality control and quality assurance activities. (9 credits per semester)

Pre-Requisites: Completion of all required CLS 600 level courses

Genetics and Molecular Basis of Disease (BHS 740)
This course lays down the foundation in basic genetic concepts with the objective of understanding the hereditability and/or molecular basis of disease. Recent evidence and diagnostic procedures suggest that genetic diseases make up a large proportion of the total disease burden in both pediatric and adult populations. Today's health care practitioner and biomedical scientist must understand the science of medical genetics and the consequences of altered genomics and proteomics. Advances in the development of new and more accurate methods of diagnosing hereditary disease have led to a greater "genetic awareness" and recognition that genetics plays a role in all areas of medicine. Using a wide spectrum of examples it will illustrate the impact of mutations as found in thalassemias, sickle cell anemia, cystic fibrosis, familial Amyotrophic Lateral Sclerosis and Huntington's Disease as causes of disease. It will also discuss genetics as a predisposing factor, such as in the case of birth defects, breast cancer, Alzheimer's Disease, alcoholism and some autoimmune disorders. Environmentally-induced mutagenesis and carcinogenesis and the role of oncogenes and tumor suppressor genes will be a particular focus of the second half of the course. (4 credits)

Pre-Requisites: CHE 311/312 or equivalent

Advanced Good Laboratory Practices and Laboratory Management (BHS 739)
This course provides training in the principles of good laboratory practice for personnel of laboratories who wish to produce test results that are fit for the purpose and which would stand up to the scrutiny of inspection. This allows for the reliability, retrieval and accountability for test results. These procedures are applicable to diagnostic laboratory procedures, research, forensic and in the drug safety and development sector. Topics include safety, Clinical Laboratory Improvement Act of 1988 (CLIA) government regulations, and quality assurance in the laboratory. Students will learn and apply management and quality assurance skills and concepts applicable to different laboratory settings, including specimen collection, and performance per CLIA'88-and /or moderate-complexity testing. Students will also demonstrate

competency in a wide variety of techniques used to collect, process and test specimens. (3 credits)

Year 2 - Spring

Clinical Practicum II (CLS 780)
Students will participate in a number of experiential exercises in the affiliated hospital and laboratory sites. Rotations will include Clinical Microbiology, Clinical Chemistry, Immunohematology, Hematology and Coagulation, Immunology/Serology and Molecular Diagnostic testing. The clinical practicum experience will include specimen tracking, performance of routine analyses, demonstration of specialty testing, observation of automated instrumentation and management processes, including quality control and quality assurance activities. (9 credits)

Pre-Requisites: Completion of all required CLS 600 level courses

Molecular Diagnostics (BHS 745)
This course is an application of molecular concepts to the identification of infectious agents, genetic risk of disease, presence and/or occurrence of mutations as a consequence of infections or toxic exposure. The use of genomic profiles as biomarkers associated with cancer and cancer risk, autoimmunity and hereditary disorders, as well as determination of histocompatability will be discussed and performed. Biotechnology as a diagnostic and investigative tool will be discussed. In the laboratory students will learn and perform basic molecular techniques such as DNA and RNA isolation, RT-PCR, Northern and Southern blots. Students will also be exposed to the utility of microarrays and bioinformatics in medicine. (4 credits)

Clinical Correlations (CLS 760)
Students will evaluate a series of case studies which integrate all disciplines of laboratory diagnostic medicine. The cases will require knowledge of laboratory test result normal, factors that affect the accuracy of laboratory test results, quality management principles, and the ability to integrate diverse information to arrive at a diagnosis, corrective action or quality improvement recommendation. (2 credits)

Pre-Requisites: CLS 780

Capstone (BHS 790)
The capstone project is a culminating experience blending all aspects of diagnostic laboratory practice and clinical research. Students will demonstrate the ability to read and analyze scientific literature, formulate case studies or project topics, prepare findings for oral presentation and complete a literature review with final paper or poster presentation. (3 credits)

MS, CYTOTECHNOLOGY/MOLECULAR CYTOLOGY (MSCMC)

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Course Name**	**Credits**		**Code**	**Course Name**	**Credits**
CYT 610	Cytopathology of Female Genital Tract	4		CYT 630	Exfoliative Non-Gynecologic Cytopathology II	2
CYT 620	Exfoliative Non-Gynecologic Cytopathology I	2		CYT 650	Cytopreparatory Techniques II	1
CYT 640	Cytopreparatory Techniques I	1		CYT 660	Fine Needle Aspiration Cytology I	3
BHS 610	Cellular Pathophysiology and Histology I	3		BHS 620	Cellular Pathophysiology and Histology II	3
BHS 739	Advanced Good Laboratory Practices/Lab Management	3		BHS 745	Molecular Diagnostics	3
BHS 740	Genetics/Molecular Basis of Disease	4		BHS 765	Grand Rounds in Pathology	1
ETH 610	Ethics in Research	1		BIO 650	Research Design	2
PSC 672	Experimental Design and Data Analysis	2				
Total Credits		**20**		**Total Credits**		**15**
SUMMER SESSION 1				**SUMMER SESSION 2**		
CYT 670	Fine Needle Aspiration Cytology II	3		CYT 770	Clinical Practicum I	3
BHS 750	Flow Cytometry	3		BHS 760	Advanced Topics in Biotechnology- Student's FNA Portfolio	3
BHS 755	In Situ Hybridization-Principle, protocol and applications	2				
Total Credits		**8**		**Total Credits**		**6**
YEAR 2 FALL						
Code	**Course Name**	**Credits**				
CYT 780	Clinical Practicum II	6				
BHS 790	Capstone Project	3				
Total Credits		**9**				

Year 1 - Fall

Cytopathology of the Female Genital Tract (CYT 610)
This course will present the basic principles of Cytopathology applied to the cellular samples obtained from the female reproductive system. Topics covered are the gross and microscopic anatomy, physiology and pathology of the cervix. This course will establish a foundation for identifying and understanding the basic epithelial cell types. Benign, reactive, and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Pre-malignant and malignant conditions will be discussed and identified on cytologic specimens obtained primarily from the Pap Test. In the laboratory students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from the FGT that demonstrate a wide variety of benign to malignant conditions. Infectious organisms and the

cellular changes they produce will be identified. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. (4 credits)

Exfoliative Non-Gynecologic Cytopathology I (CYT 620)
This course will present the basic principles of cytopathology applied to the cellular samples obtained from a variety of body sites through brushings, washings and scrapings. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the Respiratory Tract and Gastro-intestinal Tract will be examined. This course will expand on the foundation for identifying and understanding the basic epithelial cell types begun in Introduction to Cytology and Cytology of the FGT. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance on a variety of cytologic specimens will be explored. Cellular changes induced by therapies and environmental entities will be discussed and their role in rendering a final diagnosis will be recognized. In the laboratory students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. Infectious organisms and the cellular changes they produce will be identified. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. (2 credits)

Cytopreparatory Techniques I (CYT 640)
This course will develop the skills necessary to prepare a wide variety of specimens and teaches how to select and apply the appropriate staining technique for each. Students will learn to develop a Cytology Preparation Manual and how to comply with all State, OSHA and Federal regulations in a working laboratory. Emphasis will be placed on safe, efficient and effective handling techniques. Students will make a collection of representative slides from a variety of body sites using expired specimens donated from clinical affiliates. (1 credit)

Cellular Pathophysiology and Histology I (BHS 610)
This course surveys the biochemical and molecular mechanisms underlying disease processes and precipitating cellular change and death. Events of cellular energetics, signaling, gene expression and mutations will be highlighted. The morphological, pathological and clinical correlates of these cellular events will be presented after a histological foundation is established. Basic concepts of cell swelling, inflammation, atrophy, apoptosis, necrosis, dysplasia, anaplasia and neoplasia will be illustrated and identified through microscopy. Once principles are established, a systems approach is taken to demonstrate system-specific pathology. (3 credits)

Genetics/Molecular Basis of Disease (BHS 740)
This course lays down the foundation in basic genetic concepts with the objective of understanding the hereditability and/or molecular basis of disease. Recent evidence and diagnostic procedures suggest that genetic diseases make up a large proportion of the total disease burden in both pediatric and adult populations. Today's health care practitioner and biomedical scientist must understand the science of medical genetics and the consequences of altered genomics and proteomics. Advances in the development of new and more accurate methods of diagnosing hereditary disease have led to a greater "genetic awareness" and recognition that genetics plays a role in all areas of medicine. Using a wide spectrum of examples it will illustrate the impact of mutations as found in thalassemias, sickle cell anemia, cystic fibrosis, familial Amyotrophic Lateral Sclerosis and Huntington's Disease as causes of

disease. It will also discuss genetics as a predisposing factor, such as in the case of birth defects, breast cancer, Alzheimer's Disease, alcoholism and some autoimmune disorders. Environmentally-induced mutagenesis and carcinogenesis and the role of oncogenes and tumor suppressor genes will be a particular focus of the second half of the course. (4 credits)

Pre-Requisites: CHE 311/312

Ethics in Research (ETH 610)
This course includes a discussion format based on ethical issues involved in the research process. Students will have focused reading on the ethical issues involved in research and then will apply the readings to case studies during discussion. Topics covered will include, but are not limited to: morality and research ethics, ethical issues before research committees, ethical issues involving human and animal subjects, reporting of research and conflict of interest. (1 credit)

Experimental Design and Data Analysis (PSC 672)
This course is required for all Pharmaceutical Sciences graduate students and provides students with a basic knowledge of experimental design and biostatistics. Students will learn how to design experiments and analyze the results. The course will cover single factor experiments, multiple factors, full factorial and fractional factorial designs and screening designs, the fundamentals of hypothesis testing and relevant biostatistics. (2 credits)

Advanced Good Laboratory Practices/Lab Management (BHS 739)
This course provides training in the principles of good laboratory practice for personnel of laboratories who wish to produce test results that are fit for the purpose and which would stand up to the scrutiny of inspection. This allows for the reliability, retrieval and accountability for test results. These procedures are applicable to diagnostic laboratory procedures, research, forensic and in the drug safety and development sector. Topics include safety, Clinical Laboratory Improvement Act of 1988 (CLIA) government regulations, and quality assurance in the laboratory. Students will learn and apply management and quality assurance skills and concepts applicable to different laboratory settings, including specimen collection, and performance per CLIA'88-and /or moderate-complexity testing. Students will also demonstrate competency in a wide variety of techniques used to collect, process and test specimens. (3 credits)

Year 1 - Spring

Exfoliative Non-Gynecologic Cytopathology II (CYT 630)
This course will present the basic principles of cytopathology applied to the cellular samples obtained from a variety of body sites through brushings, washings and scrapings. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the Genital Urinary System, Body Cavity Fluids and Cerebral Spinal Fluid will be examined. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance on a variety of cytologic specimens will be explored. Cellular changes induced by therapies and environmental entities will be discussed and their role in rendering a final diagnosis will be recognized. In the laboratory students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. Infectious organisms and the cellular changes they

produce will be identified. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. (2 credits)

Cytopreparatory Techniques II (CYT 650)
This course will develop the skills necessary to prepare a wide variety of specimens and teaches how to select and apply the appropriate staining technique for each. Students will learn to develop a Cytology Preparation Manual and how to comply with all State, OSHA and Federal regulations in a working laboratory. Emphasis will be placed on safe, efficient and effective handling techniques. Students will make a collection of representative slides from a variety of body sites using expired specimens donated from clinical affiliates. (1 credit)

Fine Needle Aspiration Cytology I (CYT 660)
This course will present the basic principles of cytopathology applied to the cellular samples obtained through fine needle aspiration (FNA) from a variety of body sites where lesions can be identified by Radiological techniques. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the Breast, Thyroid Glands, Salivary Glands and Lymph Nodes will be examined. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance will be explored. Cellular changes induced by therapies and environmental entities will be discussed and their role in rendering a final diagnosis will be recognized. In the laboratory students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. Infectious organisms and the cellular changes they produce will be identified. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. (3 credits)

Pre-Requisites: CYT 630

Cellular Pathophysiology and Histology II (BHS 620)
This course suveys the biochemical and molecular mechanisms underlying disease processes and precipitating cellular change and death. Events of cellular energetics, signaling, gene expression and mutations will be highlighted. The morphological, pathological and clinical correlates of these cellular events will be presented after a histological foundation is established. Basic concepts of cell swelling, inflammation, atrophy, apoptosis, necrosis, dysplasia, anaplasia and neoplasia will be illustrated and identified through microscopy. Once principles are established, a systems approach is taken to demonstrate system-specific pathology. (3 credits)

Molecular Diagnostics (BHS 745)
This course is an application of molecular concepts to the identification of infectious agents, genetic risk of disease, presence and/or occurrence of mutations as a consequence of infections or toxic exposure. The use of genomic profiles as biomarkers associated with cancer and cancer risk, autoimmunity and hereditary disorders, as well as determination of histocompatability will be discussed and performed. Biotechnology as a diagnostic and investigative tool will be discussed. In the laboratory students will learn and perform basic molecular techniques such as DNA and RNA isolation, RT-PCR, Northern and Southern blots. Students will also be exposed to the utility of microarrays and bioinformatics in medicine. (4 credits)

Grand Rounds in Pathology (BHS 765)
Case presentations and discussion in surgical pathology, forensics, and radiation oncology in the medical grand rounds format. This one credit course will have a series of sessions with pathologists and/ or other specialty physicians from hospitals in the Capitol District presenting a series of interesting cases. The presentations will illustrate patient symptomatology, the entire process of diagnostics and patient management and clinical outcomes thus integrating diagnostic testing and their critical role in optimal patient outcomes. (1 credit)

Research Design (BIO 650)
This graduate-level course will introduce students to the research methods used in the biological sciences. Topics to be covered include research design, data collection and documentation, critical literature review, preparation of a NIH-style grant application, and academic presentations and publications. Class discussions, workshops, and writing assignments will provide students with opportunities to both practice learned research methods as well as apply these methods toward the design of a potential thesis research project. (2 credits)

Summer Session - 1

Fine Needle Aspiration Cytology II (CYT 670)
This course presents the basic principles of cytopathology applied to the cellular samples obtained through fine needle aspiration (FNA) from a variety of body sites where lesions can be identified by Radiological techniques. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the Liver, Pancreas, Ovary, Kidney Adrenal Glands and Central Nervous System will be examined. The course will also include FNA of unusual lesions like: mediastinal lesions, bone and soft tissue lesions and pediatric tumors. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance will be explored. Cellular changes induced by therapies and environmental entities will be discussed and their role in rendering a final diagnosis will be recognized. In the laboratory students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. Infectious organisms and the cellular changes they produce will be identified. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. (3 credits)

Pre-Requisites: CYT 660

Flow Cytometry (BHS 750)
This course introduces the principles and applications of flow cytometry through lectures and laboratory/group work. Major topics include: machine set-up and operation, fluorochromes and fluorescence, spectral overlap and compensation, experimental design, data collection and multi-parameter analyses, immunophenotyping, research application, clinical applications and disease diagnosis. (3 credits)

In Situ Hybridization (BHS 755)
This course is an introduction to the theory and application of molecular hybridization and in situ hybridization techniques. Selection of probes, their application and appropriate detection systems for both RNA and DNA in situ hybridization techniques will be discussed in lecture and

laboratory. A focus of the course will be the applications of hybridization techniques to the diagnosis and prognosis of human disease. (2 credits)

Pre-Requisites: BHS 650 or PSC 312

Summer Session - 2

Clinical Practicum I (CYT 770)
This course consists of two clinical rotations, the first one lasting seven weeks and the second for one week at two different clinical affiliate laboratories. Students rotate one week in a laboratory that deals with adjuvant methodologies such as molecular diagnostics, flow cytometry or proteomics. Students “shadow” a teaching cytotechnologist through their daily routine and participate in all laboratory activities as permitted. Students are expected to pre-screen cases that will later be re-screened by the teaching cytotechnologist, participate in preparation and staining of specimens, and any FNA, Tumor Board, Tissue Correlation and Patient Follow-up activities that their teaching cytotechnologist deems appropriate. (3 credits)

Pre-Requisites: CYT 670

Advanced Topics in Biotechnology (BHS 760)
This course is an independent project required by students in the MS in Cytotechnology and Molecular Cytology Program. The students, under clinical preceptor and faculty advisement, compile FNA specimens from clinical rotations and create a presentation of case studies. Each case study includes patient history, cytologic and histologic findings, photographic images of the cases, ancillary testing results, and information on the entity involved. This project allows students to participate in various laboratory activities and strengthens their training. Only cytotechnology students, who have successfully completed training on campus and are in the clinical rotation phase of the program, are eligible. (3 credits)

Year 2 - Fall

Clinical Practicum II (CYT 780)
This course is a continuation of CYT 770 with two clinical rotations, scheduled as described for CYT 770. (6 credits)

Pre-Requisites: CYT 770

Capstone Project (BHS 790)
The capstone project is a culminating experience blending all aspects of diagnostic laboratory practice and clinical research. Students will demonstrate the ability to read and analyze scientific literature, formulate case studies or project topics, prepare findings for oral presentation and complete a literature review with final paper or poster presentation.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES

MS, HEALTH OUTCOMES AND INFORMATICS (MSHOI)

FALL YEAR 1				SPRING YEAR 1		
Code	**Course Name**	**Credits**		**Code**	**Course Name**	**Credits**
HRI 610	Quantitative Regression Analysis	3		HRI 625	Health Systems	3
HRI 615	Health Outcomes	3		HRI 635	Statistical Programming	3
MAT 610	Statistical Inference and Modeling	3		HRI 645	Epidemiology	3
Total Credits		**9**		**Total Credits**		**9**
FALL YEAR 2				**SPRING YEAR 2**		
Code	**Course Name**	**Credits**		**Code**	**Course Name**	**Credits**
HRI 655	Health Economics	3		XXX	Elective	3
HRI 665	Health Informatics	3		XXX HRI 750	Elective (T) or Capstone (NT)	3
HRI 761	Thesis Research (T) or Elective (NT)	3		HRI 761 HRI 751	Thesis Research (T) or Industry Practicum (NT)	3
Total Credits		**9**		**Total Credits**		**9**

Year 1 - Fall

Quantitative Regression Analysis (HRI 610)
This course introduces students to multiple regression methods for analyzing data in economics and related disciplines. Extensions include regression with discrete random variables, instrumental variables regression, analysis of random experiments and quasi-experiments, and regression with time series data. Accordingly, the emphasis of the course is on empirical applications. (3 credits)

Health Outcomes (HRI 615)
This course will provide students with an introduction to the principles and techniques of pharmacoeconomics and health outcomes evaluation, and to the methodologies used by decision makers and stakeholders to draft and implement health policy. It builds on the economic principles presented in health economics (US and Global Health Care Systems) to describe the major components of the current U.S. health care system. Building on that foundation, the course introduces the techniques used for evaluation of health care interventions. These methods provide the basis for measuring and assessing the economic and non-economic consequences of health care interventions, emphasizing drug therapy, and pharmaceutical services. Examples of some of the economic methods introduced include:cost of illness analysis, cost-minimization, cost-effectiveness analysis, cost-benefit analysis, and decision analysis. Non-economic measures discussed include general and disease specific quality-of-life (QOL) assessments and health status measurement. Students will demonstrate the ability to critique published studies which use pharmacoeconomic or health outcomes techniques, assessing the quality of the research and drawing relevant conclusions. (3 credits)

Pre-Requisites: PAD 415

Statistical Inference and Modeling (MAT 610)
This course provides students with a basic knowledge of biostatistics. It includes methods of experimental design and data analysis used to make inference. Topics covered include confidence intervals, hypothesis testing, multivariable regression, generalized linear models, survival models and analysis of variance. The course will also include a component which introduces the students to statistical programming. (3 credits)

Year 1 - Spring

Health Systems (HRI 625)
This course presents a systematic comparative analysis of the evolution, administrative structure, finance, and provision of medical care in selected countries throughout the world. Equity/inequity and the current and looming effects of globalization will be explored. This course will expand your understanding of health and illness by looking at them as socio-cultural and socio-economic phenomena. Important differences rooted in culture, ethnicity, social, economic and political factors will be examined to encourage innovative "framing" of U.S. health public policies. This course presents and facilitates the development of an analysis of major health service delivery and management issues from an international perspective. Each country in the world possesses and implements a unique health service delivery system. While there may be many factors, components and issues in common, there are nonetheless many differences. It is important to learn about and analyze other country's health care systems, to learn how they treat similar issues and to discover innovations. Improvement often comes through change and innovations, and this study will not neglect the opportunity to learn from others, especially those middle and lower income countries implementing interesting and innovative reforms. By utilizing a comparable model of exploration, we will gain an understanding of the similarities and differences of industrial countries, third world countries and tribal programs in the US. (3 credits)

Statistical Programming (HRI 635)
This course teaches students how to use SAS, or other appropriate statistical software (i.e. R, Stata, etc.), for statistical programming. Since SAS is used extensively at universities, at Fortune 500 type businesses, in government, at research centers, and just about any other place where data are managed and analyzed, knowing how to use SAS is a useful skill for the job market. The class focuses on aspects of statistical programming with SAS. Students will learn the techniques of database management and data manipulation. Other SAS capabilities including the graphics package and the interactive data visualization package, PROC INSIGHT, will be discussed in addition to the basic techniques for one and two sample problems, analysis of variance, linear regression, and categorical data. (3 credits)

Epidemiology (HRI 645)
This course covers the principles and methods of epidemiologic investigation including describing the patterns of illness in populations and research designs for investigating the etiology of disease. The course introduces quantitative measures to determine risk, association and procedures for standardization of rates. It also reviews application of basic principles and methods in the design and conduct of epidemiologic studies. Topics include the development of research questions; overview of epidemiologic study designs; sampling, sample size, and selection bias; techniques for data collection, sources of secondary data, and the evaluation of measurement and information bias; confounding and effect modification; techniques for simple and stratified analyses; and an introduction to mathematical modeling in epidemiology. (3 credits)

Year 2 - Fall

Health Economics (HRI 655)
This course is designed to introduce students to the economics of health care, with an emphasis on individual (i.e. demand side) decisions. We will examine how to apply microeconomic tools to analyze health care issues. Topics to be covered include demand for health and health care, individual responses to incentives inherent in health insurance markets, labor market effects, and health capital and health behavior decisions. Additionally, methodological issues for policy evaluation including cost-effectiveness and cost benefit analysis and estimating policy effects will be examined. Discussions will cover theoretical foundations as well as empirical methods and findings. (3 credits)

Health Informatics (HRI 665)
Health Informatics will introduce students to an interrelated set of theories, issues, technologies and methods related to the desire to improve health care through information technology. Different perspectives on the topic will be presented, with a particular emphasis on human factors and organizational learning. Students will gain practical experience in developing small health-related web applications. This will assist them in understanding the practical difficulties involved in improving systems through technology. In addition to a set of core health informatics topics, students will be given a set of optional topics from which they will choose one to research in depth. (3 credits)

Thesis Research (HRI 761)
Students will pursue a thesis project in a health outcomes research area selected to appropriately match their chosen career goals. In conjunction with the thesis advisor, students will perform an in-depth literature search and develop a testable hypothesis. The student and mentor then will work together to define a series of experiments that can be conducted to test the hypothesis. The student will learn the necessary techniques, conduct the experiments and analyze the data under the guidance of the mentor. Thesis work is compiled in a dissertation and presented as part of the thesis defense. (1-6 credits)

Year 2 - Spring

Capstone (HRI 750)
The capstone project is an integrative activity with a variety of final products based on the degree program and type of project undertaken. It is an opportunity for a student to gain additional training in one or more areas of health outcomes and informatics. The scope of the projects will vary based on the industry placement or investigators involved and may include but not limited to the examination of the primary literature on the subject, organizing and modeling data, performing health outcomes and informatics analysis, and providing recommendations. The common elements for each project is the production of a high quality project (research project or exhaustive case studies), the requirement for oral presentation of the final project and review by the corporate and faculty supervisor. (3 credits)

Industry Practicum (HRI 751)
The industry practicum is part of a capstone experience for students in ACPHS' master's degree program in Health Outcomes and Informatics. The practicum offers an educational opportunity for students to work for corporate clients doing real-time work, under the guidance of faculty, to analyze problems, negotiate requirements and scope, and solution development. The experience integrates all of a student's previous coursework. The capstone project is an integrative activity with a variety of final products based on the type of project undertaken. It is an opportunity for a student to gain additional training in one or more areas of health outcomes and informatics. (3 credits)

MS, MOLECULAR BIOSCIENCES (MSMBS)

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
BIO 625	Advanced Molecular Biology	3		BIO 650	Research Design/Thesis Proposal	2
ETH 610	Ethics in Research	1		BIO 660	Journal Club	1
MAT 610	Statistical Inference and Modeling	3		BIO630	Advanced Cell Biology	3
BIO 670	Research Rotation	2		XXX	Elective	3
Total Credits		**9**		**Total Credits**		**9**
YEAR 2 FALL				**YEAR 2 SPRING**		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
XXX	Elective	3		XXX	Elective	3
BIO 701	Thesis Research	3		BIO 701	Thesis Research	3
XXX	Elective	3				
Total Credits		**9**		**Total Credits**		**6**

Year 1 - Fall

Advanced Molecular Biology (BIO 625)
An advanced treatment of genetics in microbial and animal systems, focused on the biochemical and molecular aspects of genetics structure and function. Information derived from current and recent genomic analyses and genomic comparisons will be included. This course will consist of both lectures and small discussion groups that delve more deeply into lecture material and primary scientific literature. (3 credits)

Pre-Requisites: PSC 311/312 or CHE 312/313

Ethics in Research (ETH 610)
This course includes a discussion format based on ethical issues involved in the research process. Students will have focused reading on the ethical issues involved in research and then will apply the readings to case studies during discussion. Topics covered will include, but are not limited to: morality and research ethics, ethical issues before research committees, ethical issues involving human and animal subjects, reporting of research and conflict of interest. (1 credit)

Statistical Inference and Modeling (MAT 610)
This course provides students with a basic knowledge of biostatistics. It includes methods of experimental design and data analysis used to make inference. Topics covered include confidence intervals, hypothesis testing, multivariable regression, generalized linear models, survival models and analysis of variance. The course will also include a component which introduces the students to statistical programming. (3 credits)

Research Rotation (BIO 670)
Students will complete two laboratory rotations of seven weeks each in order to facilitate the selection of a thesis research advisor. Students will select a potential mentor based on interests and availability of openings in any given lab. Assignments, based on student preferences, will be made by the program director. Students are expected to spend a minimum of 10 hours per

week on laboratory research during the rotation. They are to meet with the faculty advisor at least one hour per week for basic introduction to laboratory principles and practices, and to discuss their research. Students are required to complete reading assignments as directed by the faculty advisor and write a report of the research data and present a ten minute talk summarizing their research at the end of the rotation. (2 credits)

Year 1 - Spring

Research Design (BIO 650)
This graduate-level course will introduce students to the research methods used in the biological sciences. Topics to be covered include research design, data collection and documentation, critical literature review, preparation of a NIH-style grant application, and academic presentations and publications. Class discussions, workshops, and writing assignments will provide students with opportunities to both practice learned research methods as well as apply these methods toward the design of a potential thesis research project. (2 credits)

Journal Club (BIO 660)
This course is designed to enhance the ability of graduate students to critically evaluate scientific articles published in juried scientific journals. Articles will be selected from current scientific literature in a variety of disciplines in the molecular biosciences, including cell biology, molecular biology, medicinal chemistry biochemistry, microbiology, immunology and infectious diseases. All participants will read and critique the articles. Each student will present at least two articles per semester. (1 credit)

Advanced Cell Biology (BIO 630)
This graduate level course is designed to present foundational principles as well as cutting-edge developments in key areas of eukaryotic cell biology. Focusing on eukaryotic cell structure and function, topics will include: cellular structures and organelles; cell cycling; signal transduction; gene regulation; and intracellular trafficking. This course will consist of both lectures by faculty in their areas of expertise and small discussion groups that delve more deeply into lecture material and primary scientific literature. Students will be expected to demonstrate their knowledge of course material by participation in discussion groups and by examinations. (3 credits)

Pre-Requisites: BIO 101/111, BIO 102/121, BIO 235 recommended

Year 2 - Fall

Thesis Research (Bio 701)
The student will identify an appropriate area of research and a thesis advisor. The student will develop a research proposal. The specific topic and nature of the research will be determined by the student and thesis advisor. On receiving approval from the program director, a thesis committee will be established to act in an advisory capacity for the thesis proposal defense. On successful defense of the proposal the student will commence the research. Studies involving humans must be approved by the College's IRB. Studies involving animals must be approved by IAUCC. Projects involving data collection and management must adhere to GLP requirements. Once the work has been completed, the student will write and defend the thesis. (1-6 credits)

Year 2 - Spring

Thesis Research (Bio 701)
The student will identify an appropriate area of research and a thesis advisor. The student will develop a research proposal. The specific topic and nature of the research will be determined by the student and thesis advisor. On receiving approval from the program director, a thesis committee will be established to act in an advisory capacity for the thesis proposal defense. On successful defense of the proposal the student will commence the research. Studies involving humans must be approved by the College's IRB. Studies involving animals must be approved by IAUCC. Projects involving data collection and management must adhere to GLP requirements. Once the work has been completed, the student will write and defend the thesis. (1-6 credits)

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES

MS, PHARMACEUTICAL SCIENCES (MSPS)

Thesis Track (Pharmacology (PCOL) or Pharmaceutics (PCEU) Concentration)

YEAR 1 FALL				**YEAR 1 SPRING**		
Code	**Name**	**Credit**		**Code**	**Name**	**Credits**
PSC 631	Foundations of Pharmaceutical Sciences	3		PSC 635 PSC 645	Pharmacological Regulation of Signal Transduction (PCOL) OR Drug Delivery Principles (PCEU)	3
ETH 610	Ethics in Research	1		PSC 651	Pharmaceutical Sciences Journal Club	1
PSC 672	Experimental Design and Data Analysis	2		PSC 636 PSC 741	Systems Pharmacology: Neural Systems (PCOL) OR Pharmacokinetic Modeling (PCEU)	3
PSC 661	Research Rotation	2		PSC	Thesis Research	3
PSC 651	Pharmaceutical Sciences Journal Club	1				
Total Credits		**9**		**Total Credits**		**10**
YEAR 2 FALL				**YEAR 2 SPRING**		
XXX	Elective	3		XXX	Elective	3
XXX	Elective	3		PSC	Thesis Research	2
PSC 761	Thesis Research	3				
Total Credits		**9**		**Total Credits**		**5**

Non-Thesis Track (Pharmacology (PCOL) or Pharmaceutics (PCEU) Concentration)

YEAR 1 FALL				**YEAR 1 SPRING**		
Code	**Name**	**Credit**		**Code**	**Name**	**Credits**
PSC 631	Foundations of Pharmaceutical Sciences	3		PSC 635	Pharmacological Regulation of Signal Transduction (PCOL) OR Drug Delivery Principles	3
ETH 610	Ethics in Research	1		PSC 651	Pharmaceutical Sciences Journal Club	1
PSC 672	Experimental Design and Data Analysis	2		PSC 636 OR PSC 741	Systems Pharmacology: Neural Systems (PCOL) Pharmacokinetic Modeling (PCEU)	3
XXX	Elective	2		XXX	Elective	2
PSC 651	Pharmaceutical Sciences Journal Club	1				
Total Credits		**9**		**Total Credits**		**9**
YEAR 2 FALL				**YEAR 2 SPRING**		
XXX	Elective	3		XXX	Elective(s)	3
XXX	Elective	3		PSC	Capstone	3
XXX	Elective	3				
Total Credits		**9**		**Total Credits**		**6**

Year 1 - Fall

Foundations of Pharmaceutical Sciences (PSC 631)
The course reviews the foundational topics in Pharmacology, Pharmaceutics and Medicinal Chemistry, setting the stage for subsequent courses in the Pharmacology and Pharmaceutics tracks of the MSPS program. Topics covered include principles of receptor and ligand interactions, dose response curves, pharmacokinetics (absorption, distribution, and elimination of drugs), structure-activity relationships, pharmacodynamics (drug concentration and effect), biotransformation of drugs and factors affecting drug action, principles of computational modeling of receptor-drug interactions, and rational drug design. (3 credits)

Pre-Requisites: CHE 312 or PSC 311; PSC 321/322

Ethics in Research (ETH 610)
This course includes a discussion format based on ethical issues involved in the research process. Students will have focused reading on the ethical issues involved in research and then will apply the readings to case studies during discussion. Topics covered will include, but are not limited to: morality and research ethics, ethical issues before research committees, ethical issues involving human and animal subjects, reporting of research and conflict of interest. (1 credit)

Experimental Design and Data Analysis (PSC 672)
This course is required for all Pharmaceutical Sciences graduate students and provides students with a basic knowledge of experimental design and biostatistics. Students will learn how to design experiments and analyze the results. The course will cover single factor experiments, multiple factors, full factorial and fractional factorial designs and screening designs, the fundamentals of hypothesis testing and relevant biostatistics. (2 credits)

Research Rotation (PSC 661)
Students will complete a one semester laboratory rotation in order to facilitate the selection of a thesis research advisor. Students select a potential mentor based on interests and availability of openings in any given lab. Assignments, based on student preferences, will be made by the Pharmaceutical Sciences graduate program director. Students are expected to spend a minimum of 10 hours per week on laboratory research during the rotation. Students complete a rotation through a minimum of 1 lab and a maximum of 2 labs during the semester. They are to meet with the faculty advisor at least one hour per week for basic introduction to laboratory principles and practices, and to discuss their research. Students are required to complete reading assignments as directed by the faculty advisor and write a report of the research data and present a ten minute talk summarizing their research at the end of the rotation. (2 credits)

Pharmaceutical Sciences Journal Club (PSC 651)
This course, which is required for all Pharmaceutical Sciences graduate students, is designed to enhance the ability of graduate students to critically evaluate scientific articles published in juried scientific journals. Articles will be selected from current scientific literature in a variety of disciplines in the pharmaceutical sciences, including drug delivery, drug development, medicinal chemistry, molecular biology, pharmacogenomics, pharmacology, physiology, biochemistry and pharmaceutics. All participants will read and critique the articles. Each student will present at least two articles per semester. (1 credit)

Year 1 - Spring

Pharmacological Regulation of Signal Transduction (PCOL) or Drug Delivery Principles (PCEU) (PSC 635 or PSC 645)
PSC 635: *Pharmacologic Regulation of Signal Transduction*. The course covers major drug classes, including antibiotics, anti-virals, anti-neoplastics, and drugs which act within the gastrointestinal tract. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of model compounds from each drug class will be considered. (2 credits)

Pre-Requisites: PSC 431/631 or equivalent

PSC 645: *Drug Delivery Principles*. The course studies physicochemical and biological principles of drug delivery and pharmaceutical product design. These principles of physical pharmacy and biopharmaceutics are the foundations for drug candidate selection, pre-formulation, formulation design, and drug delivery systems. Targeted drug delivery and advanced systems for various routes of administration are also discussed by case studies. (3 credits)

Pre-Requisites: PSC 341/342 or PSC 431/631 or equivalent

Pharmaceutical Sciences Journal Club (PSC 651)
This course, which is required for all Pharmaceutical Sciences graduate students, is designed to enhance the ability of graduate students to critically evaluate scientific articles published in juried scientific journals. Articles will be selected from current scientific literature in a variety of disciplines in the pharmaceutical sciences, including drug delivery, drug development, medicinal chemistry, molecular biology, pharmacogenomics, pharmacology, physiology, biochemistry and pharmaceutics. All participants will read and critique the articles. Each student will present at least two articles per semester. (1 credit)

Systems Pharmacology: Neural Systems (PCOL) or Pharmacokinetic Modeling (PCEU) (PSC 636 or PSC 741)
PSC 636: *Neuronal Systems Pharmacology*. The course covers autonomic drugs, CNS drugs, including anesthetics, sedative hypnotics, antidepressants, antipsychotics, anti-seizure drugs, analgesics, and anti-Parkinson agents, and drugs used to treat endocrine disorders, including calcium disorders, hypothalamus, pituitary, and thyroid problems, anti-androgens, anti-estrogens and progestins, and drugs used to treat diabetes and hypoglycemia. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of each drug class will be considered. (3 credits)

Pre-Requisites: PSC 635 or equivalent

PSC 741: *Pharmacokinetic Modeling*. The course presents concepts and mathematical techniques for description of the time course of drug disposition in biological systems. The course also presents biopharmaceutical and pharmacokinetic principles used in the selection, dosing, monitoring and evaluation of drug therapy. At the end of the course the student should be able to find, obtain, understand, analyze, evaluate, and synthesize pharmacokinetic information and make informed, rational, and responsible evaluation of drug dosage regimens. (3 credits)

Pre-Requisites: PSC 645 or permission of instructor

Thesis Research (PSC 761)
This course consists of an independent research project which has been designed by the student, in consultation with the thesis advisor. The thesis advisor and thesis committee will be selected. The student will then develop a thesis proposal which will be approved by the thesis committee. Once the work described in the thesis proposal has been completed, the student will write and defend the thesis. It is anticipated that the thesis research will be completed over 2-3 semesters. (1-8 credits)

Year 2 - Fall

Thesis Research (PSC 761)
This course consists of an independent research project which has been designed by the student, in consultation with the thesis advisor. The thesis advisor and thesis committee will be selected. The student will then develop a thesis proposal which will be approved by the thesis committee. Once the work described in the thesis proposal has been completed, the student will write and defend the thesis. It is anticipated that the thesis research will be completed over 2-3 semesters. (1-8 credits)

Year 2 - Spring

Thesis Research (PSC 761)
This course consists of an independent research project which has been designed by the student, in consultation with the thesis advisor. The thesis advisor and thesis committee will be selected. The student will then develop a thesis proposal which will be approved by the thesis committee. Once the work described in the thesis proposal has been completed, the student will write and defend the thesis. It is anticipated that the thesis research will be completed over 2-3 semesters. (1-8 credits)

Capstone (PSC 750)*
The capstone writing project is run as an independent study course. Students will select a topic in conjunction with the faculty instructor and prepare a written review of the existing scientific literature that is relevant to the chosen topic. The review should focus on a particular scientific problem that is actively being investigated and should define and discuss the scope of the problem, the alternative approaches that are being taken to address the problem, the substantive findings that have resulted from these approaches, and how these findings have shaped the current state of knowledge of the problem. (3 credits)

Pre-Requisites: permission of instructor

*Denotes Class for students on Non-Thesis Track

Agreements

ACPHS offers students opportunities to pursue several additional courses of study through established agreements with other educational institutions. These agreements allow for seamless transitions between ACPHS and institutions listed below:

Albany Law School

This agreement provides ACPHS students the opportunity to earn a bachelor's degree in Pharmaceutical Sciences from ACPHS and the Juris Doctor degree from Albany Law School in six years.

Albany Medical College

This agreement provides highly qualified ACPHS students with the opportunity to apply to **medical school** at the end of their second year. If accepted, students are assured admission two years later, upon completion of their undergraduate degree requirements.

This agreement will offer highly qualified ACPHS students the opportunity to apply to the Center for **Physician Assistant Studies** concurrent with their admission to ACPHS.

Castleton University

This agreement provides students who have completed a Bachelor of Science degree in Health Science (or related field) from Castleton University the opportunity to complete a Doctor of Pharmacy program at ACPHS.

Clarkson University Graduate School

This agreement provides ACPHS students the opportunity to complete a Master's in Clinical Leadership in Healthcare Management or an MBA in Healthcare Administration (both offered by CUGC) in combination with a B.S. in Pharmaceutical Sciences (from ACPHS).

This agreement provides ACPHS students the opportunity to complete a Master's in Clinical Leadership in Healthcare Management or an MBA in Healthcare Administration (both offered by CUGC) in combination with a Doctor of Pharmacy (from ACPHS).

College of St. Rose

This agreement provides an opportunity for students who have completed a Bachelor of Science degree at the College of St. Rose to pursue a Master’s Degrees in Cytotechnology and Molecular Cytology; Clinical Laboratory Sciences; or Molecular Biosciences (formerly Biotechnology) at ACPHS.

Hudson Valley Community College

This agreement provides an opportunity for qualified students who have completed the two-year associate’s degree in Biotechnology at Hudson Valley Community College to pursue a Bachelor of Science degree at ACPHS. Students will enter in the third year of the selected B.S. program.

Roger Williams University

This agreement provides an opportunity for qualified students who have successfully completed all requirements for the RWU Bachelor's Degree in Chemistry, Biology, or Biochemistry to pursue the Doctor of Pharmacy Program at the ACPHS Vermont campus. The program requires seven years of full-time equivalency study.

Saint Michael's College

This agreement provides an opportunity for students who have completed a Bachelor of Science degree in Biology (or related field) from St. Michael's College to pursue a Doctor of Pharmacy degree at ACPHS.

Schenectady County Community College

This agreement provides an opportunity for qualified students who have completed the two-year degree in Science at Schenectady County Community College to pursue a B.S. in Biomedical Technology at ACPHS. SCCC students will enter the bachelor's program as juniors.

The Sage Colleges

This agreement provides an opportunity for students who have completed a Bachelor of Science degree at The Sage Colleges to pursue a Master's Degree in Cytotechnology and Molecular Cytology; Clinical Laboratory Sciences; or Molecular Biosciences (formerly Biotechnology) at ACPHS.

Union College

This agreement provides an opportunity for qualified ACPHS students, after two years at the College, to pursue a liberal arts degree, or those qualified students from Union College, after two years at Union College, to pursue a Bachelor of Science or Doctor of Pharmacy at ACPHS.

University at Albany

This agreement provides an opportunity for students who have completed a Bachelor of Science degree in Human Biology (or related field) at the University at Albany the opportunity to pursue Master's Degrees in (a) Cytotechnology and Molecular Cytology or (b) Clinical Laboratory Sciences at ACPHS.

This agreement provides an opportunity for students who have completed a Bachelor of Science degree in Chemistry (or related field) at the University at Albany to pursue a Doctor of Pharmacy degree at ACPHS.

Utica College

This agreement provides an opportunity for students who have completed a Bachelor of Science degree in Chemistry (or related field) from Utica College to pursue a Doctor of Pharmacy degree from ACPHS.

Joint Degrees

Through a joint degree program, you can earn two degrees in less time (and at less cost) than it would take to pursue them separately.

ACPHS offers three B.S./M.S. joint degree programs - each of which can be completed in just five years:

- B.S. and M.S. in Pharmaceutical Sciences
- B.S. in Biomedical Technology and M.S. in Clinical Laboratory Sciences
- B.S. in Biomedical Technology and M.S. in Cytotechnology and Molecular Cytology

In addition to these programs, ACPHS has affiliations with other colleges and universities in the region that allows students to take coursework at both schools and graduate with an additional degree in areas such as law, business, or physician assistant studies.

With the job market becoming increasingly competitive for all careers, having two degrees could be the difference in helping you land your first job, shortening the time to a Ph.D. or other advanced degree, or getting that coveted promotion.

If you've ever thought about some day getting a graduate degree, why delay it? Now is the time.

INNOVATIVE LEARNING

The Office of Innovative Learning at ACPHS works with faculty to develop new approaches to teaching and learning. Faculty interested in learning more about the resources available to them from this Office are encouraged to e-mail Innovative Learning.

Innovative learning can mean different things to different people. Too often it is merely associated with the introduction of new technologies. ACPHS is evolving a strategy for innovative learning based on:

- Developing 21st century skills throughout the curriculum
- Flipping the classroom and creating interactive learning experiences
- Developing digital presentations of student accomplishments
- Collaborating and sharing
- Adjusting to the mobile computing world (tablets and smartphones)
- Making use of open learning content in various medias

Helping the College facilitate this strategy is The DeNuzzo Center for Innovative Learning. Named in honor of legendary ACPHS Professor Rinaldo DeNuzzo, the Center helps promote and coordinate activities related to innovative learning, including:

- Case studies on innovative learning
- Coordination of interest groups related to innovative learning
- Coordination of information on research and development activities for teaching and learning
- Information on educational research grant opportunities

Contact: Judy Teng
Director of Instructional Design Services
518-694-7210
Judy.Teng@acphs.edu

LIBRARY SERVICES

The libraries on both campuses provide high quality resources, services and educational experiences to support current and future information needs of the Albany College of Pharmacy and Health Sciences community.

Library Services supports student success by providing formal instruction that develops the skills needed to find, retrieve, analyze and ethically use information. These educational activities span the curricula, engage multiple learning styles, and occur in individual, group and online settings. Additional access to help from professional librarians is also readily available in person and online, on demand or by appointment.

The Library Services website (http://libraryservices.acphs.edu) is the portal to the library catalog, an extensive online collection of research databases, electronic books and journals, and mobile applications. The physical collection, housed on both campuses, consists of books, journals, and multimedia which are available for loan. Access to additional resources is available through the libraries' partnerships with local, state, and national academic institutions through our free interlibrary loan services.

Students will find comfortable and engaging spaces with ample seating for individual study and collaborative learning on both campuses. Printing, photocopying, faxing, and scanning capabilities are also available to support student research and document management needs.

Pharmacy and pharmaceutical sciences represent a particular strength in the collection, with extensive resources dating from the 1800s to the present. The archives houses documents and artifacts that preserve the rich history of the College.

RESEARCH

Research is a core component of the academic life at ACPHS. Faculty and students at the College are involved in a wide range of research projects, with special concentrations in infectious disease, oncology, hematology, and nephrology.

In addition to laboratory-based research, faculty members are also exploring different health care related issues such as patient-provider communications, medication adherence, and the evaluation of outcomes data.

The annual ACPHS Research Forum serves as both a showcase for this work and a vehicle for facilitating inter-disciplinary collaborations. A look at the most recent Forum agenda offers a useful guide to understanding the variety of research now taking place at the College.

Pharmaceutical Research Institute

The Pharmaceutical Research Institute (PRI) at Albany College of Pharmacy and Health Sciences is a center for drug discovery and development, with an expertise in the development of nano-pharmaceutical agents.

PRI is led by Shaker A. Mousa, Ph.D., M.B.A., FACC, FACB, a former Senior Scientist and Fellow at DuPont Pharmaceutical Company. Dr. Mousa holds over 250 U.S. and international patents, and his work has been reported in more than 800 peer reviewed publications.

As part of its mission, PRI is also engaged in teaching and learning. Pharmacy students, graduate students, and visiting scholars from around the world visit the Institute to conduct research and learn the latest advances across a range of therapeutic areas.

Research Opportunities for Students

One of the benefits of attending ACPHS is that all of our academic programs are centered around human health. So if you are a student interested in a specific field of health research, there's a good chance that a faculty member here is studying that subject.

The College also offers specific programs and activities designed to encourage student research. Examples include our longstanding Student Summer Research Awards program and the Student Research Symposium, an annual showcase for student research projects.

Another advantage available to you as an ACPHS student is the ability to leverage the College’s relationships with the pharmaceutical industry to pursue a research-based rotation or internship. Pharmaceutical companies where ACPHS has placed students include AstraZeneca, Boehringer Ingelheim, Bristol-Myers Squibb, Johnson & Johnson, Novartis, Pfizer, and Sanofi Genzyme.

There are also several student-led clubs and organizations that host guest speakers or lead group activities for those interested in gaining additional exposure to research.

Facilities and Equipment

Between our Albany Campus, Vermont Campus, and Pharmaceutical Research Institute, the College has approximately 21,000 square feet of bench research space.

In each of these locations, ACPHS investigators benefit from the College's proximity to other research-based institutions where existing relationships allow access to additional equipment, laboratory space, and of course, potential collaborators.

A list of institutions where such arrangements exist include the UAlbany Cancer Center, Albany Stratton Veterans Administration (VA) Medical Center, Albany Medical College, Rensselaer Polytechnic Institute, University of Vermont, and the Wadsworth Center (New York State's Public Health Laboratory).

Intramural Grant Programs
ACPHS works to facilitate research activity and assist young investigators in a variety of ways. Two of those include:

SCHOLARSHIP OF DISCOVERY INTRAMURAL RESEARCH GRANT PROGRAM - This intramural grant program helps support scholarly activity that increases the body of knowledge within an investigator's discipline. This includes, but is not limited to scientific, clinical, historical, cultural, and literary pursuits. The goal of the Program is to promote research leading to competitive extramural grant applications, peer-reviewed presentations, and peer-reviewed publications.

THE RUDOLPH & DOROTHY BLYTHE RESEARCH AWARD - The objective of this intramural grant program is to provide support for promising scientists in their early academic career who have a full-time faculty appointment at ACPHS in the area of pharmaceutical or biomedical sciences to complete or develop preliminary data for submission of extramural application for major funding.

Research Compliance
The Research Compliance Office provides access to a variety of resources and training programs to ensure all individuals engaged in research at the College adhere to the highest standards for responsible and ethical conduct. Click the link below to view our policies and guidelines in the following areas:

- Research Compliance, Integrity, and Reporting of Concerns
- Responsible Conduct of Research
- Human Subjects
- Animal Care and Use
- CITI Training
- Conflicts of Interest

Policies and Guidelines
Office of Research and Scholarly Activity
The Office of Research and Scholarly Activity (ORSA) supports faculty members throughout the lifecycle of sponsored funds by helping ensure each faculty member has the resources and information they need to be successful. ORSA is comprised of:

- Office of Grants Administration
- Institutional Animal Care and Use Committee (IACUC)
- Institutional Review Board (IRB)
- Institutional Biosafety Committee (IBC)
- Institutional Laboratory Safety Committee (ILSC)
- Research Committee

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

GUIDE TO ACPHS COURSE PREFIXES

ART	ART
BIOMEDICAL/HEALTH SCIENCES	BHS
BIOLOGY	BIO
CHEMISTRY	CHE
INTRODUCTORY & ADVANCED PHARMACY PRACTICE EXPERIENCE ROTATIONS	CLK
CLINICAL LABORATORY SCIENCES	CLS
COMPUTER SCIENCE	CMP
COMMUNICATIONS	COM
CYTOTECHNOLOGY	CYT
ECONOMICS	ECN
EDUCATION	EDU
ETHICS	ETH
GENERAL	GEN
HISTORY	HIS
HEALTH OUTCOMES AND INFORMATICS	HOI
SOCIAL SCIENCES	HSS
HUMANITIES	HUM
INTEGRATED PROBLEM SOLVING	IPS
LITERATURE	LIT
MATHEMATICS	MAT
MUSIC	MUS
PHARMACY ADMINISTRATION	PAD
PUBLIC HEALTH	PBH
PHARMACY	PHD
PHILOSOPHY & RELIGION	PHI
PHARMACY	PHM
PHYSICS	PHY
PHARMACEUTICAL SCIENCES	PSC
PHARMACY SKILLS	PSL
PSYCHOLOGY	PSY
PHARMACOTHERAPY/PHARMACOLOGY/ MEDICINAL CHEMISTRY	PTP
SOCIOLOGY	SOC
UGC	UNION GRADUATE COLLEGE

ACPHS COURSE DESCRIPTIONS

Courses with the following prefixes can be used to satisfy the liberal arts requirement: HUM, EDU, ENG, ART, PHI, ETH, PSY, HIS, MUS, SOC; as well as BHS 230 and BHS 350. COM courses at the 100 and 200 level can also be used to satisfy the liberal arts requirement.

Courses with a prefix of LIT are cross-listed as ENG. Students wishing to have the ENG number appear on their transcript should contact the Registrar's office.

Courses with a "G" at end of prefix and number are graduate courses. Graduate courses are numbered as 600 or higher. Graduate courses numbered as 600-699 are designated as introductory or first year graduate courses, courses numbered 700-799 are considered to be intermediate graduate courses and courses numbered 800-899 are advanced graduate courses. Graduate credit can only be awarded for courses numbered as 600 level or higher. Courses at the 500 level are higher level professional courses (PharmD). Graduate students cannot receive credit for undergraduate (400 or lower), however graduate courses can be cross-listed and offered simultaneously with an undergraduate (300 or 400 level) or professional course (500 level), as long as the distinctions between the graduate offering and the undergraduate/professional course are explained in the course proposal and approved by the appropriate curriculum committees. Undergraduate and professional students may enroll in graduate courses (600 level or higher) and receive either graduate or undergraduate/professional credit.

ART 105 *Introduction to Drawing (formerly LAS 141)*. This course assumes that anyone can learn to draw better if they first learn to see better. Following Betty Edwards' Drawing on the Right Side of the Brain, the course will present the different problems people encounter when trying to draw what they see (or think they see). Class time is primarily spent drawing, although there are some brief quizzes on the reading. Students keep a sketchbook outside of class, write three essays and one museum paper, participate in biweekly critiques and turn in a portfolio of drawings and papers at the end of the semester. **(3)**

ART 110 *History of Cinema (formerly LAS 261)*. This course will trace the history of film from its beginnings in the 1890s until today. Through an investigation of the technological, economic, social and aesthetic influences on cinema, the course provides students with a background in film history as well as critical and analytical skills to read not only films but also visual texts. **(3)**

ART 210 *Masterpieces of Art (formerly LAS 118).* This course investigates various masterpieces of Western art, including architecture, painting and sculpture. Each class meeting is devoted to a separate work of art, and students discuss what makes that work a masterpiece. Individual perceptions and reactions are encouraged. **(3)**; **Prerequisite:** HUM 102

ART 215 *Figure Drawing (formerly LAS 201).* The human figure presents special challenges for the artist. This course covers a brief history of the human figure in art and how to draw the figure from the inside out, beginning with studies of the skeleton and muscles, and then copying works of the masters and drawing from a model. **(3)**; **Prerequisite:** ART 105 Recommended

ART 220 *Museum Experience*. Why bother going to a museum when all that old stuff is online anyway? This course offers students the opportunity to explore national, local, and regional art museums, report on the experience, and create not only a virtual exhibit but also a brochure highlighting a museum for future visitors from ACPHS. One-third of the class hours will be in the classroom or on class trips; the rest will be completed individually and online. This elective complements and enhances the three semester Humanities sequence, which focuses on masterpieces of civilization and builds upon the notion, as Lionel Trilling stated, that "there is

a certain minimum of our intellectual and spiritual tradition which a man must experience and understand if he is to be called educated." **(3)**

BHS 201 *Medical Terminology.* This course will provide a systems approach to learning medical terminology. The course is self-paced and offered online. It will present medical terminology through a unique combination of anatomy and physiology, word-building principles, and phonetic "sounds like" pronunciations. It is well suited for students who want to learn medical terminology in the context of anatomy and physiology. **(3); Prerequisite:** Sophomore standing or permission of the instructor

BHS 230 *Sophomore Seminar in Biomedical Technology.* The course facilitates the student's exposure to scientific literature and in developing the ability to critically evaluate the literature in terms of its validity and conclusions. Students are expected to master scientific writing skills, information retrieval, bibliography preparation per accepted scientific convention. Writing skills will be polished and demonstrable through preparation of a research presentation and critique. **(3)**

BHS 360 *Clinical Anatomy*. This course provides a clinical approach to the understanding of human anatomy. Integration of structure and function of organ systems will be emphasized as a way to comprehend pathologic alterations not only to the organ system but to the body as a whole. This approach will focus on the relevant medical terminology, morphology, physiology, biochemistry and clinical anatomic manifestations of disease. At the conclusion of this course, students will possess an anatomic understanding of the human body as it relates to normal physiologic function as well as disease presentation, progression and treatment. Interpretation of basic anatomic findings likely to be reported in commonly used medical imaging techniques such as CAT and MRI scans will be presented. This is an elective for non-BT students. **(3); Prerequisite:** BIO 121

BHS 365 *Introduction to Human Pathology*. The purpose of this course is to fill the void between commonly taught descriptive pathology and published treatment guidelines for most common diseases in the US today. This will be accomplished through systemic presentations including topics of pathogenesis, traditional pathologic anatomic alterations, as well as diagnostic and therapeutic mechanisms of major diseases in America. Emphasize will be on pathology as a way to understand the presentation of disease, the diagnosis of disease, and therapeutic outcomes. At the completion of this course, students will be able to interpret the results of frequently ordered laboratory tests (thyroid function tests, liver function tests, arterial blood gases, basic bacterial culture results, basic metabolic and hematologic profiles, lipid profiles, basic serologic tests, and selected molecular diagnostics) in light of common disease states. This is an elective for non-BT students. **(3); Prerequisite:** BIO 215 or PSC 322

BHS 410 *Clinical Correlations for Health Care Professionals*. This advanced level course is directed to students who anticipate employment situations in direct patient care. The purpose of this course is to reduce the perceived gap between previously completed course work and its relevance to the patient encounter. To this end, carefully selected clinical cases will serve to illustrate correlative anatomic, pathologic, physiologic, and laboratory findings as they relate to the presentation and treatment of the patient. The concept of differential diagnosis will also be explored. By the completion of this course, students are expected to be able to identify basic common disease presentations including organ system, salient pathology and lab findings, and potential therapy. **(3); Prerequisite:** BIO 215.

BHS 450 *Senior Seminar in Biotechnology*. This is a student-driven course dealing with discussion of contemporary issues and state-of-the-art diagnosis and technology in medicine. The student is required to critically review the literature and present during class time while incorporating knowledge gained through previous years in the didactic and laboratory components. The course culminates in a student-sponsored research symposium open to the college community. **(3)**

BHS 490 *Independent Study in Biotechnology and Health Sciences*. This is a mentor-student proposed elective course project dealing with contemporary issues in biotechnology and medicine. The student under faculty advisement must submit a proposal to the Department Chair for approval. Approval must also be sought if students wish to use this course for remediation of credits. The topic of the course may be didactic, literature review or laboratory research. Only students in their junior and senior years are eligible. **(1-3); Prerequisite:** Junior or Senior status

BHS 610 G *Cellular Pathophysiology/Histology I.* This course will emphasize the normal microscopic histology and function of epithelia, connective tissue, cartilage and bone, muscle, nerve, blood vessels, respiratory system, female reproductive system, skin, lymphatic system, gastrointestinal system, urinary system, male reproductive system, and endocrine system. Information in this corse serves as a basis to appreciate of altered microanatomy caused by pathologic forces. **(3); Prerequisite:** BIO 214, BIO 216, BIO 235 or equivalent

BHS 620 G *Cellular Pathophysiology/Histology II.* This course is the continuation of Cellular Pathology and Histology I. Fundamental concepts of general pathology with an emphasis placed on inflammatory and neoplastic states of man are taught by sequential organ system analysis. This course also complements concurrent courses in cytotechnology and molecular diagnostics. Students are expected to develop graded visual diagnostic skills in histopathology and correlative needle aspiration cytopathology. **(3); Prerequisite:** BHS 610

BHS 730 G *Advanced Good Laboratory Practices and Laboratory Management (formerly BHS 630 G) .* This course educates students in the topics essential for clinical laboratory entry-level knowledge of management and operations in the current healthcare environment. Students will learn and apply principles of management and leadership, along with conflict management. Additionally, students will develop skills in calculations for laboratory associated finance cost/benefit analysis, budgeting, revenue generation, billing and reimbursements. Students will review topics associated with state and federal regulations including the Clinical Laboratory Improvement Act of 1988 (CLIA), human resource guidelines and regulations, employee performance evaluations and appraisals, education and training of the adult learner. Laboratory operation discussions will focus on good laboratory practice (GLP), quality assurance, performance improvement and total quality management topics, pre analytical, analytical and post analytical processing, laboratory information systems and electronic medical records. Students will review career planning strategies, professional development, resume and interviewing skills. **(3)**

BHS 740 G *Genetics and Molecular Basis of Disease (formerly BHS 650 G).* This course lays the foundation ofbasic genetic concepts with the objective of understanding the hereditability and/or molecular basis of disease. Common genetic diseases such as sickle cell anemia, cystic fibrosis and Huntington's Disease are studied to illustrate the mechanism that mutations causes disorders. Next generation sequencing technology and bioinformatics will be introduced the advanced and future technologies in human genetics. The course will also emphasize topics such as prenatal diagnosis and genetic counseling, cytogentics, cancer and genetics, application of biomarkers, and pharmacogenomics. Lecture and Lab **(4)**; **Prerequisite:** CHE 311/312 or equivalent

BHS 745 G *Molecular Diagnostics (formerly BHS 660 G*). Molecular diagnostics uses DNA, RNA, and protein tests to identify a disease, determine its course, evaluate response to therapy, and understand the predisposition for a disease. The purpose of this course is for students to learn basic skills, fundamental theory and advanced technology in the field of molecular diagnostics. After studying assay methods including nucleic acids extraction, PCR and real time PCR, hybridization, arrays and next generation sequencing, students will learn how to apply them to the diagnosis of infectious disease, cancer and genetic disorders. The purpose of the course also includes training and support for students who are interested in becoming clinical molecular biologists. **(3) Prerequisite:** CHE 311/312 or equivalent

BHS 750 G *Flow Cytometry (formerly BHS 670 G)*. This course introduces the principles and applications of flow cytometry through lectures and laboratory/group work. Major topics include: machine set-up and operation, fluorochromes and fluorescence, spectral overlap and compensation, experimental design, data collection and multi-parameter analyses, immunophenotyping, research application, clinical applications and disease diagnosis. **(3); Prerequisite:** Graduate standing or permission of instructor

BHS 755 G *In situ Hybridization (formerly BHS 675 G)*. This course is an introduction to the theory and application of molecular hybridization and in situ hybridization techniques. Selection of probes, their application and appropriate detection systems for both RNA and DNA in situ hybridization techniques will be discussed in lecture and laboratory. A focus of the course will be the applications of hybridization techniques to the diagnosis and prognosis of human disease. **(2); Prerequisite:** BHS 740 or PSC 312

BHS 760 G *Advanced Topics in Biotechnology* - Fine Needle Aspiration (FNA) Portfolio *(formerly BHS 690 G)*. This course is an independent project required by students in the MS in Cytotechnology and Molecular Cytology Program. The students, under clinical preceptor and faculty advisement, compile FNA specimens from clinical rotations and create a presentation of case studies. Each case study includes patient history, cytologic and histologic findings, photographic images of the cases, ancillary testing results, and information on the entity involved. This project allows students to participate in various laboratory activities and strengthens their training. Only cytotechnology students, who have successfully completed training on campus and are in the clinical rotation phase of the program, are eligible. **(3); Corequisite:** CYT 770.

BHS 765 G *Grand Rounds in Pathology (formerly BHS 830 G).* Case presentations and discussion in cytopathology, surgical pathology, forensics and radiation oncology in the medical grand rounds format. This one credit course will have a series of sessions with pathologists, specialty physicians and other laboratory professionals from hospitals in the Capitol District. The presentations will illustrate an interesting case, patient symptomatology, as well as the entire process of diagnostics, patient management and clinical outcomes; thus integrating diagnostic testing and its critical role in optimal patient care. **(1)**

BHS 790 G *Capstone (formerly BHS 600 G).* The capstone project is open to Clinical Laboratory Science and Cytotechnology Master Degree students only. The scope of this project will vary based on the clinical site, investigators, research mentors and research projects available and could be an exhaustive case study presentation, a hypothesis driven independent research project, or a major literature review on an existing scientific topic that is relevant to the student's field of study. The common elements for each project is the production of a peer-reviewed, journal article quality, written document. Upon completion of the course, the student will demonstrate the ability to synthesize and analyze a complex scientific topic using critical thinking skills, evaluating possible outcomes and clearly presenting sound scientific conclusions. Students may be required to orally present their final project for committee review. **(3); Corequisite**: CLS 760 or CYT 780

BIO 101 *General Biology I.* This course emphasizes critical thinking and scientific analysis while dealing with the molecular and cellular aspects of life. Major topics covered include biological molecules, cellular structure, cellular metabolism, Mendelian genetics, molecular genetics, classification of organisms and the principles of evolution. Laboratory exercises concentrate on the scientific process and method while examining cell structure, tissue structure, molecular genetics and biotechnology. The themes of self-discovery and individual scientific investigation run throughout this course. This is the initial course in biological sciences for BS students. Course prerequisites requiring BIO 101 are also satisfied by BIO 111 and vice versa. **(4);** Lecture and Laboratory

BIO 102 *General Biology II.* This course continues to emphasize critical scientific thinking while focusing on the diversity of animal life and the complex interactions that occur between organisms and their environment.

Major topics covered include a phylogenetic survey of organisms and an introduction to the comparative physiology of the major vertebrate organ systems. The final area covered in the course is Ecology. Topics in this section include population ecology, community ecology, ecosystems, biomes and a discussion of the future challenges to the biosphere. Laboratory exercises continue to concentrate on scientific thinking and self-discovery. This is the second course in the biological sciences for BS Students. Course prerequisites requiring BIO 102 are also satisfied by BIO 121 and vice versa. **(4); Prerequisite:** BIO 101 or permission of the instructor. Lecture and Laboratory

BIO 111 *General Biology I.* This course focuses on the molecular and cellular aspects of life. Major topics covered include biological molecules, cellular structure, cellular metabolism, Mendelian genetics, molecular genetics and classification of organisms. Laboratory exercises concentrate on cell structure, tissue structure, molecular genetics and biotechnology. This is the initial course in biological sciences for PharmD students. Course prerequisites requiring BIO 111 are also satisfied by BIO 101 and vice versa. **(4);** Lecture and Laboratory

BIO 121 *General Biology II.* This course focuses on the diversity of animal life and the complex interactions that occur within and between organisms with a strong emphasis on human systems. Major topics covered include a phylogenetic survey of organisms, comparative physiology of the major vertebrate organ systems, cellular mechanisms of development, embryology, population and community ecology, and future challenges to the biosphere. Laboratory exercises concentrate on comparative anatomy and physiology with a strong emphasis on human biology. This is the second course in the biological sciences for PharmD students. Course prerequisites requiring BIO 121 are also satisfied by BIO 102 and vice versa. **(4); Prerequisite:** BIO 111 or permission of the instructor; Lecture and Laboratory

BIO 156 *Nutrition.* This one semester course will teach the fundamental concepts of nutrition relevant to contemporary issues in health. It will present an inter-disciplinary approach by integrating knowledge from the fields of anatomy, physiology, chemistry and microbiology. Food balancing and the selection of nutritionally adequate diets will be examined. The effects of food additives, processing, and the safety of our food supply will be explored. Nutritional changes throughout the lifecycle will also be discussed. Students will be asked to assess and evaluate research and literature in the field of nutrition. **(3)**

BIO 161 *Community Health.* This introductory course will provide the student with the knowledge and skills for healthy decision making in the areas of personal and community wellness and safety. Students will discuss critical and contemporary health issues including psychological health, nutrition, fitness and weight management, chemical abuse, human sexuality, parenting, aging, death and dying, the environment and the health care system. **(3)**

BIO 210 *Microbiology (formerly BIO 312).* The goal of this course is to cover the fundamentals of microbiology and infectious diseases. The first half of the course focuses on the general characteristics of prokaryotes, eukaryotes & viruses and explores the basic concepts in microbial physiology and genetics. The mechanisms by which antimicrobials control the growth of microorganisms are also discussed. The second half of the course examines the causative agents and pathogenesis of infectious diseases caused by medically important bacteria, viruses, fungi and protozoa. Diagnosis and treatment of these diseases are also discussed via clinical case studies to foster active learning by the students. The laboratory component provides hands-on experience to students with sterile technique, staining, various biochemical tests and molecular techniques. **(4); Prerequisites:** BIO 101/111, BIO 102/121; Lecture and Laboratory

BIO 213 *Anatomy and Physiology I.* This lecture course will provide an introduction to the function, regulation and integration of organs and organ systems involved in human physiology. This course will begin with a review of the basic cell and tissue concepts covered in General Biology. Following that will be a detailed discussion of membrane potentials, the anatomy and physiology of the nervous system, major sensory organs,

and central nervous system function. This knowledge will then be applied in a discussion of muscle structure and function. Finally the endocrine system and body coordination will be covered. **(3); Prerequisites:** BIO 101/111, BIO 102/121

BIO 214 *Anatomy and Physiology I Laboratory.* This laboratory course complements the Anatomy and Physiology I lecture course (BIO213). The focus of this course is on human anatomy at a level that is appropriate for those students interested in healthcare careers. The sequence of organ systems studied are integumentary system, nervous system, skeletal system, muscular system and endocrine system. Laboratory exercises teach students concepts in anatomy and physiology using anatomical models, histology specimens, virtual human cadaver software and electrophysiology workstations. Clinical correlations are made through the extensive use of medical case studies. **(1); Corequisite:** BIO 213

BIO 215 *Anatomy and Physiology II.* This lecture course continues an introduction to the function, regulation and integration of organs and organ systems involved in human physiology. This course will focus on the cardiovascular system, respiratory, renal and gastrointestinal systems. Also dealt with will be aspects of metabolism and temperature regulation. The final section of the course will discuss host defense as a system and then review an integrated approach to the organ systems via the use of clinical case problems. **(3); Prerequisite:** BIO 213 or permission of the instructor.

BIO 216 *Anatomy and Physiology II Laboratory.* This laboratory course complements the Anatomy and Physiology II lecture course (BIO215). The focus of this course is on human anatomy at a level that is appropriate for those students interested in healthcare careers. The sequence of organ systems studied are male and female reproductive systems, cardiovascular system, respiratory system, urinary system and digestive system. Laboratory exercises teach students concepts in anatomy and physiology using anatomical models, histology specimens, virtual human cadaver software and electrophysiology workstations. Clinical correlations are made through the extensive use of medical case studies. **(1); Corequisite:** BIO 215

BIO 225 *Genetics.* This lecture-based course will cover the basic principles of genetics, primarily as they relate to mammalian and human biology. Major topics to be covered include genomic structure, organization, and function, processes of genetic recombination, DNA mutation and repair, mechanisms of gene regulation, concepts of Mendelian inheritance, selection, genetic mapping, genetic engineering, population genetics, developmental genetics, and model organisms. The role of genetics in human health and disease will also be discussed, with an emphasis on mechanisms, diagnosis, and current treatments for genetic diseases. **(3); Prerequisites:** BIO 101 or BIO 101/111, BIO 102 /121, or permission of the instructor.

BIO 235 *Cell Biology.* The ultimate goal of this course is that students achieve a solid understanding of cell biology. By the end of the course students will: have an understanding of the fundamental chemistry and physics of cells and thus of life; gain appreciation for protein structure and function in the context of key cellular reactions; obtain in-depth knowledge of DNA structure, function, replication, and repair; identify the means by which gene expression and gene-products can be fine tuned; achieve an evolutionary perspective on cells and life in general; become aware of cutting edge molecular techniques; be able to describe membrane structure and transport across cell membranes; become cognizant of how their cells obtain energy from food; realize the importance of the cytoskeleton, intracellular compartments, and protein transport; speak the language of cells by understanding how cells communicate; admire the contribution of genetics, cell division, and sexual reproduction to the diversity of life; and realize the profound impact stem cells and cancer have on human health. **(3); Prerequisites**: BIO 101/111, BIO 102/121

BIO 236 *Cell Biology Laboratory.* In this laboratory course, designed to complement the Cell Biology lecture, students will investigate cell types, discover nucleic acids, synthesize macromolecules, energize cells,

manipulate cellular transport, understand reproduction and chromosomes, comprehend genetic inheritance, utilize cell biology for forensics, and learn occupation-applicable cell culture and molecular staining techniques. Students will work in groups, applying knowledge gained in lecture, to solve problem sets related to the laboratory topics. **(1); Corequisite:** BIO 235

BIO 240 *Virology.* This lecture-based course provides an introduction to the field of virology. Topics presented will include virus structure, viral genetics, steps in viral replication, diseases and pathogensis, and natural history of a variety of medically important viruses. The discovery and activity of contemporary anti-viral drugs and therapeutics will also be discussed. Case studies, group discussions, and analyses of current scientific literature will be used to foster an in-depth understanding of virology and its relationship to human health. **(3); Prerequisites:** BIO 210

BIO 245 *Biological Basis of Disease*. This course will be translational in nature by teaching students essential concepts in human anatomy, physiology and pathology in the context of significant human diseases in the United States and globally. Topics will include coverage of human disease as it affects the cardiovascular, respiratory, renal, digestive, immune, neural and endocrine systems. There will be a major emphasis on the cellular, molecular, genetic, and biochemical basis for disease in these organ systems, as well as in heritable diseases and cancer. Introductory lectures will be followed by discussion of the primary literature that complements the lecture material. Designed to give students an appreciation of diseases affecting the major organ systems, and how these illnesses have been analyzed using the tools of genetics, biochemistry, and cell and molecular biology. **(3); Prerequisites:** BIO 102 or BIO 121

BIO 255 *Biotechnology*. This survey course will provide the student with a broad knowledge of modern biotechnology (including its pharmaceutical and industrial aspects). A number of cutting-edge topics will be discussed, such as: recombinant expression of foreign genes, production and engineering of therapeutic proteins, structure- and mechanism-based drug design, and nanobiotechnology. The course will rely on a combination of lectures, literature discussions, and recorded seminars. **(3); Prerequisites:** BIO 210; CHE 211

BIO 270 *Public Health Toxicology.* This course will provide the student an understanding of how toxic agents in the workplace, home and environment are identified, evaluated for their potential threat to various populations and the measures that public health officials may employ to protect sensitive populations. In addition, this course will examine the distribution of toxic agents through ecosystems and introduce the student to the assessment tools that the toxicologist uses to predict injury to humans and wildlife. Concepts in this course will usually be introduced through the use of case studies examining landmark cases that have influenced public policy such as Love canal, Bhopal India, and Minamoto Japan. **(3); Prerequisites:** BIO102 or BIO121, CHE102 or CHE121

BIO 290 *Undergraduate Research.* This course provides an opportunity for students to obtain a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. BIO 290 is generally reserved for introductory level experiences and/or smaller scale projects. Students are expected to perform three hours of research related work per credit hour earned. **(1-3); Prerequisite:** permission of the instructor

BIO 315 *Public Health Microbiology.* The goal of the course is to provide an in depth understanding of emergence, transmission, pathogenicity, and control of infectious diseases relevant to public health. The course will primarily focus on emerging infectious diseases, zoonotic and vector borne diseases, sexually transmitted diseases, and food and water borne diseases. Additional topics of discussion will include bioterrorism and antibiotic resistance issues as they relate to public health. Emphasis will be placed on understanding and applying the critical concepts of epidemiology and microbiology to a particular public health problem by using clinical case studies. **(3); Prerequisites**: BIO 210

BIO 327 *Plant Biochemistry and Natural Products.* This course is an introduction to the study of biomedically important molecules derived from plant metabolism usually known as natural products or herbals. The course will provide an overview of the various aspects of natural product research. An emphasis of the course will be the scientific investigation of natural products to evaluate their utility as therapeutic agents in human medicine. An important theme of the course is the integration of knowledge from prior courses in organic chemistry, biochemistry, and physiology. Topics covered include a review of basic plant biochemistry (including photosynthesis), primary plant metabolism, and secondary plant metabolism. Secondary plant metabolites include the polyketides; the phenylpropanoids, polyphenolics, lignins, tannins, flavanoids, isoprenoids, terpenes, and the alkaloids. The later part of the course will focus on the biological effects of natural products especially in human medicine. **(3); Prerequisite:** CHE 211 or CHE 245 and BIO 215 or PSC 322 or permission of the instructor.

BIO 335 *Topics in Physiology and Pathophysiology.* This course expands upon the concepts introduced in BIO 213/215. The course involves in-depth exploration of one or more of the core areas in pathophysiology. Topics covered may include cardiovascular pathophysiology, pulmonary pathophysiology, renal pathophysiology, hematology, cancer and inflammatory diseases. There is a strong emphasis on integration of knowledge developed in other courses in the curriculum such as medicinal chemistry, pharmacology and pharmacotherapy. **(3); Prerequisites:** BIO 215 or PSC 322 or permission of the instructor.

BIO 340 *Microbial Genetics.* This course will cover fundamental concepts of microbial genetics and will provide an understanding in the structure, maintenance, expression and exchange of genetic materials in microbial cells. In particular, the mechanisms of DNA replication, transcription, translation, and methods for regulation of gene expression will be discussed. The course will also emphasize topics like transduction, transformation, conjugation, transposition and DNA mutation and repair. Application of these concepts to investigate research problems in Bioinformatics and Proteomics is also presented. **(3); Prerequisites:** BIO 210

BIO 350 *Biomedical Laboratory Techniques I.* In the first course of this series, emphasis will be placed on imparting hands-on training in immunology and biochemistry laboratory techniques and application of these techniques to investigate research problems. Students will be trained in good laboratory practices, lab safety, proper handling of equipment, use of standard protocols, incorporation of appropriate controls, data collection, analysis and interpretation of experimental results. **(3); Prerequisites:** BIO 210; CHE 201/211

BIO 355 *Biomedical Laboratory Techniques II.* In the second course of this series, emphasis will be placed on imparting hands-on training in laboratory techniques routinely used in molecular biology and microbial genetics and application of these techniques to develop and investigate research problems. Students will be trained in good laboratory practices, lab safety, proper handling of equipment, use of standard protocols, incorporation of appropriate controls, data collection, analysis and interpretation of experimental results. **(3); Prerequisites:** BIO 210; CHE 201

BIO 360 *Industrial Microbiology and Bioprocessing.* This course will introduce students to the cultivation and utilization of microbial cells in commercial bioprocess engineering. Topics for discussion will include: microbial physiology and biosynthetic pathways; biotechnology; fermentation systems and downstream processing; biomanufacturing of fuels, biocatalysts, chemicals, pharmaceuticals, and food products including beer, wine, cheese, and yogurt; biomass, bioremediation and biomining; cGMP regulations and compliance procedures; methods of sterilization and disinfection; and safety procedures. **(3); Prerequisite:** BIO 210

BIO 365 *Medical Mycology and Parasitology.* This first half of this course will introduce students to helminth and protozoan parasites of medical and veterinary importance; life cycles, morphology, physiology, taxonomic classification, life cycles, host-parasite relationships, economic and public health aspects and current topics in

parasitic diseases. The second half of the course involves a comparative study of the morphology, physiology, ecology, and pathogenicity of medically important fungi. Discussions will include infectious diseases caused by fungi including their etiology, epidemiology, histopathology, diagnosis, and treatment. **(3); Prerequisite:** BIO 210

BIO 370 *Microbial Physiology.* This lecture based course provides an in-depth analysis of the general concepts of prokaryotic cell biology with a particular emphasis on eubacteria. Topics presented will include key functions of all prokaryotic cells including DNA replication, transcription, translation, protein secretion, energy production, stress responses, motility, and signaling. Key structural components of prokaryotic cells will also be described including membranes, the cell wall, and glycocalyx. Latter portions of the semester will cover the physiology of specific pathogens during the course of infection. This course is focused on lecture-based, graphical presentation but also includes components of self-directed learning and critical thinking including group discussions and student research papers. **(3); Prerequisites:** BIO 210; CHE 201/211

BIO 410 *Pharmaceutical Microbiology.* This course will introduce the principles of microbiology as applied to manufacturing aspects of pharmaceutical industry. It will cover a wide range of topics including the nature of micro-organisms, contamination sources and control, sterilization and disinfection, and sterility testing methodologies. Antimicrobial agents, their modes of action and mechanisms of drug resistance will be discussed in detail. The students will also acquire knowledge of various microbiological assays and evaluation methods of antimicrobials. Drug designing and regulatory requirements for conducting clinical trials will be discussed. Good Manufacturing Practices (GMP), Quality Control (QC), and Quality assurance (QA) in the manufacturing processes of pharmaceuticals based on current regulatory requirements will also be discussed. **(3); Prerequisite:** BIO 210

BIO 455 *Toxicology.* This course will provide students with a background in general toxicology and will focus specifically on the toxicology of drugs. The course introduction will include basic mechanisms of toxicity, cellular pathology, and chemical carcinogenesis. The primary focus of the course will be on drug-induced renal, hepatic, respiratory, neurological, cardiovascular, developmental, and reproductive toxicology. Carcinogenic activity of drugs will also be presented. Examples of specific drug toxicity using case studies will be utilized in the course. Regulatory toxicology will also be addressed, as will typical approaches to preclinical and clinical toxicity risk assessment. **(3); Prerequisites:** BIO 215 or PSC 321, CHE 202/221

BIO 480 *Microbiology Capstone Experience I.* Microbiology Capstone Experience is an opportunity for students to integrate information from earlier courses and apply the concepts and skills acquired to a microbiology related research problem or an extramural internship experience. The course will assist students in their learning by bridging their classroom knowledge with real world microbiological issues faced by the researchers and health care professionals in academia and/or industry. Microbiology Capstone Experience is a combination of two senior-level microbiology courses for a total of six credit hours. Students will be required to complete a hypothesis driven independent research project culminating in an oral/written presentation. An approved internship experience in any microbiology or public health laboratory, pharmaceutical industry, or government agency employing microbiologists may be substituted for one semester of Capstone experience. **(3); Prerequisite**: Senior Standing in Microbiology Program or permission of the instructor

BIO 485 *Microbiology Capstone Experience II.* Continuation of BIO 480. **(3); Prerequisite:** BIO 480

BIO 490 *Undergraduate Research.* This course provides an opportunity for students to obtain a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. BIO 490 is generally reserved for more advanced research projects of students with prior research experience. Students are expected to perform three hours of research related work per credit hour earned. Faculty members may expect students

to present their research in venues either internal or external to the college. **(1-3); Prerequisite:** permission of the instructor

BIO 491 *Undergraduate Research***.** This course provides an opportunity for students to obtain PharmD professional elective credit for a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. BIO 491 is generally reserved for more advanced research projects of students with prior research experience. Students are expected to perform three hours of research related work per credit hour earned. Faculty members may expect students to present their research in venues either internal or external to the college. **(1-3); Prerequisite:** permission of the instructor

BIO 620 G *Advanced Topics in Microbiology*. This course will explore various cutting-edge topics in Microbiology through Journal club style presentations of primary literature from high impact peer reviewed journals. Each session will begin with a brief overview of the background information by the instructor followed by critical evaluation of the paper through student presentations and group discussions. The course will be divided in four broad themes. The first theme covers general microbial concepts including bacterial physiology and structure, metabolism and genetics. The second theme will explore the microbial virulence mechanisms, anti-microbials, and antibiotic resistance mechanisms, along with discussing novel prophylactic and therapeutic strategies for important bacterial infectious diseases. The third theme of the course will include the nature and biological activities of viruses, virus-host interactions and some important viral diseases. The last theme will focus on the important advances made in the field of host-pathogen interactions including innate and adaptive immune responses against selected pathogens. **(1-3); Prerequisite:** permission of the instructor

BIO 625 G *Advanced Molecular Biology.* This lecture-based course provides an in-depth analysis of the general concepts of molecular biology in prokaryotic and eukaryotic cells that occur in nature as well as those applied to the laboratory. The course consists of 3 parts. The first part of the course will focus on aspects of molecular biology that occur in nature. Topics presented will include detailed mechanisms of DNA organization, DNA replication, transcription, gene regulation, genetic recombination, translation, protein folding and degradation, and biochemistry of lipids and membrane formation. The second part of the course will focus on concepts of molecular biology that have been exploited for use in laboratory research. Topics will include cell growth and tissue culture, analysis and manipulation of DNA (DNA isolation, hybridization, PCR, sequencing, creation of knockouts/mutants, RNAi, qPCR, & RNA seq), the functions and importance of antibodies in research, recombinant protein expression and purification, and protein analysis/detection methods. The third part of the course will focus on scientific communication. In this part of the course students will give a journal-club style oral presentation on a topic in molecular biology. **(3); Prerequisite:** PSC 311/312 or CHE 312/313 or equivalent

BIO 630 G *Advanced Cell Biology*. This lecture-based course provides an in-depth analysis of the general concepts of cell biology with a particular focus on eukaryotic cells within the animal kingdom. Topics presented will include key events in the cytosol and cytoplasmic organelles (including protein production, protein modifications, vesicle trafficking and energy production), structural components of cells (including membranes, the cytoskeleton, and extracellular matrix), cell signaling, programmed cell death modules, and functions of specialized cell types (including coverage of the immune system). This course is focused on lecture-based, graphical presentation but also includes components of self-directed learning and critical thinking including group discussions and student presentations. **(3); Prerequisite:** BIO 101/111 and BIO 102/121. BIO 235 or equivalent is strongly recommended.

BIO 640 G *Toxicology.* This course will provide students with a background in general toxicology and will focus specifically on the toxicology of drugs. The course introduction will include basic mechanisms of toxicity, cellular pathology, and chemical carcinogenesis. The primary focus of the course will be on drug-induced renal,

hepatic, respiratory, neurological, cardiovascular, developmental, and reproductive toxicology. Carcinogenic activity of drugs will also be presented. Examples of specific drug toxicity using case studies will be utilized in the course. Regulatory toxicology will also be addressed, as will typical approaches to preclinical and clinical toxicity risk assessment. **(3); Prerequisites:** BIO 215 or PSC 321, CHE 202/221 or equivalent courses

BIO 650 G *Research Design*. This graduate-level course will introduce students to the research methods used in the biological sciences. Topics to be covered include research design, data collection and documentation, critical literature review, preparation of a NIH-style grant application, and academic presentations and publications. Class discussions, workshops, and writing assignments will provide students with opportunities to both practice learned research methods as well as apply these methods toward the design of a potential thesis research project. **(2)**

BIO 660 G *Journal Club.* This course is designed to enhance the ability of graduate students to critically evaluate scientific articles published in juried scientific journals. Articles will be selected from current scientific literature in a variety of disciplines in the molecular biosciences, including cell biology, molecular biology, medicinal chemistry biochemistry, microbiology, immunology and infectious diseases. All participants will read and critique the articles. Each student will present at least two articles per semester. **(1)**

BIO 670 G *Research Rotation.* Students will complete two laboratory rotations of seven weeks each in order to facilitate the selection of a thesis research advisor. Students will select a potential mentor based on interests and availability of openings in any given lab. Assignments, based on student preferences, will be made by the program director. Students are expected to spend a minimum of 10 hours per week on laboratory research during the rotation. They are to meet with the faculty advisor at least one hour per week for basic introduction to laboratory principles and practices, and to discuss their research. Students are required to complete reading assignments as directed by the faculty advisor and write a report of the research data and present a ten minute talk summarizing their research at the end of the rotation. **(2)**

BIO 680 G *Bacterial Pathogenesis*. This course is designed to provide students with fundamental and cutting-edge information on the molecular mechanisms of bacterial pathogenesis. Topics presented will include virulence factors, virulence regulation and evasion strategies utilized by bacteria to survive host defense mechanisms. Special emphasis will be placed on understanding the genetic, molecular, and biochemical approaches that can be used to study these host-pathogen interactions. Intervention strategies, including vaccination and anti-microbial therapy along with bacterial resistance mechanisms will also be discussed. Data analysis from primary literature will form a major component of the course. **(3); Prerequisite:** BIO 210, BIO 236, PSC 315, PSC 311 or CHE 311, PSC 312 or equivalent courses

BIO 701 G. *Thesis.* The student will identify an appropriate area of research and a thesis advisor. The student will develop a research proposal. The specific topic and nature of the research will be determined by the student and thesis advisor. On receiving approval from the program director, a thesis committee will be established to act in an advisory capacity for the thesis proposal defense. On successful defense of the proposal the student will commence the research. Studies involving humans must be approved the College's IRB. Studies involving animals must be approved by IAUCC. Project involving data collection and management must adhere to GLP requirements. Once the work has been completed, the student will write and defend the thesis. **(1-6)**

BSS 102 *Seminar in Health Professions*. This seminar course will provide students with an introduction to many health and science related professions and to the Health and Human Sciences Program at ACPHS. The goal is to present a wide variety of options to you and give you a forum in which to discuss these career choices and the academic paths that will help you reach your goals. Class will meet for approximately 1 hour each week. Students will be required to attend seminar presentations given during class time and outside of class to

enhance their knowledge of various career pathways. Presentation topics include academic research, medical education (MD, DO), physician assistant studies, public health, and health policy and communication. As part of this course, students will prepare a résumé including a detailed outline of their plans to enhance their résumé over their time at ACPHS. Students will also prepare an evaluation of each speaker, keeping a record of specific suggestions made by each speaker as a reference document. As a class, we will also read a book and learn about the idea of public health through that process. **(1)**

CHE 101/111 *General Chemistry I.* This course provides a solid introduction to the science of chemistry with an emphasis on those concepts necessary to understand the chemistry of biological systems. Topics covered include methods of measurement, thermodynamics, atomic and molecular structure, nomenclature, periodic properties of the elements, chemical bonding, molecular geometry, intermolecular forces, chemical reactions and solutions. In the lab component of this course students perform experiments that illustrate lecture topics, develop laboratory technique, and encourage problem solving skills. PharmD students register for CHE 111, BS students register for CHE 101. Course prerequisites requiring CHE 111 are also satisfied by CHE 101 and vice versa. **(4);** Lecture and Laboratory

CHE 102/121 *General Chemistry II.* This course continues to provide a solid introduction to the science of chemistry by applying many of the topics covered in General Chemistry I to new areas. Special emphasis is again placed on those concepts necessary to understand the chemistry of biological systems. Topics covered include properties of solutions, chemical kinetics, chemical equilibrium, and acid-base equilibrium. In the lab component of this course students perform experiments that illustrate lecture topics, develop laboratory technique, and encourage problem solving skills. PharmD students register for CHE 121, BS students register for CHE 102. Course prerequisites requiring CHE 121 are also satisfied by CHE 102 and vice versa. **(4); Prerequisite:** CHE 101/111; Lecture and Laboratory

CHE 201/211 *Organic Chemistry I.* This course provides a foundation for the study of organic reactions by examining the physical and chemical properties of organic molecules. Areas covered include acid-base chemistry, functional groups, resonance, isomerism, conformations, stereochemistry, charge-distribution and its impact on reaction mechanism, kinetics and thermodynamics, nomenclature, and spectroscopy. The laboratory provides a hands-on experience with methods and instrumentation used in the synthesis, purification and characterization of organic compounds including distillation, crystallization, extraction, chromatography, spectroscopy, kinetics, and polarimetry. The lab also has components in professional writing and ethics. PharmD students register for CHE 211, BS students register for CHE 201. Course prerequisites requiring CHE 211 are also satisfied by CHE 201 and vice versa. **(4); Prerequisite:** CHE 102/121; Lecture and Laboratory

CHE 202/221 *Organic Chemistry II.* This course focuses on the synthesis and reactivity of the major classes of organic compounds with emphasis on mechanistic rationalization and stereochemistry. The application of organic chemistry to the understanding of drug stability, drug reactivity and drug interactions is highlighted. The lab component of this course focuses on the hands-on application and development of experimental techniques designed to develop laboratory skills and promote understanding of the synthesis, identification and purification of organic compounds. PharmD students register for CHE 221, BS students register for CHE 202. Course prerequisites requiring CHE 221 are also satisfied by CHE 202 and vice versa. **(4); Prerequisites:** CHE 201/211; Lecture and Laboratory

CHE 245 *Survey of Organic Chemistry.* This course is a one semester overview of the basics of organic chemistry. Physical and chemical properties of organic molecules, nomenclature, acid-base chemistry, chemical reactions of various classes of organic compounds, and stereochemistry are some of the topics to be covered. Designed to provide students in health science programs the background and understanding of organic chemistry principles, it facilitates future coursework in biochemical and biomedical studies. An

associated lab component complements the topics covered in lecture and works to develop laboratory skills. **(4); Prerequisite:** CHE 102/121; Lecture and Laboratory

CHE 253 *Scientific Communication.* The course is designed to familiarize students with various types of scientific communications and to help students develop three core skills: 1) to critically read and analyze scientific documents, 2) to learn and practice writing in proper scientific language and formats and 3) to disseminate scientific information to scientific and lay communities. The characteristics of clear, concise and organized analysis and writing in each type of scientific format will be examined through review and evaluation of scientific literature, presentations and sample grant proposals. Students will develop their skills through in class exercises, homework assignments and preparation of abstracts, proposals and articles. **(3); Prerequisite:** Junior standing

CHE 290 *Undergraduate Research.* This course provides an opportunity for students to obtain a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. CHE 290 is generally reserved for introductory level experiences and/or smaller scale projects. Students are expected to perform three hours of research related work per credit hour earned. **(1-3); Prerequisite:** permission of the instructor

CHE 311 *Biochemistry I.* This course introduces students to the basic concepts of biochemistry, reviews the key biomolecules (amino acids, proteins and enzymes, carbohydrates, lipids, nucleic acids, coenzymes, vitamins, and other physiologically and pharmacologically active small molecules), and discusses the key metabolic pathways. The relationship between biological function and chemical structure and reactivity are explored using the fundamental chemical and physical principles. **(3); Prerequisite:** CHE 202/211

CHE 312 *Biochemistry Lab I.* This course introduces students to basic methods and techniques commonly used for biochemical manipulations and analyses. **(1); Corequisite:** CHE 311

CHE 313 *Biochemistry II.* This course continues CHE 311 Biochemistry I by discussing some of the more advanced biochemical concepts and phenomena, such as biopolymer structure, signal transduction, fundamental aspects of biotechnology, bioenergetics, molecular biophysics, etc. **(3); Prerequisite:** CHE 311

CHE 318 *Bioorganic Chemistry.* This course provides instruction on introductory topics at the interface between chemistry and biology. The content will focus more specifically on the organic chemistry performed by enzymes in living systems. Enzyme chemistry will be related to how this knowledge has led, and continues to lead to, the discovery of important medicines. **(3); Prerequisites:** CHE 311, BIO 325 or permission of the instructor

CHE 323 *Environmental Chemistry and Toxicology.* This course examines several environmental topics including air and water pollution, sewage disposal, energy resources and radiation, food additives, flavor enhancers and sweeteners, insecticides, plastics and polymers in the environment and the chemistry of home care products. It also considers factors which bring about pollution of water and air and methods of controlling these pollutants. Principles of toxicology and carcinogenesis are considered, as well as the biotransformation of the pollutants aforementioned and other sources and their effect on body tissue. **(3); Prerequisite:** CHE 221

CHE 345 *Physical Chemistry I.* This course covers fundamental concepts of physical chemistry including thermodynamics (with applications to chemical and phase equilibria and electrochemistry), and reaction kinetics and mechanisms. Emphasis is on solving qualitative and quantitative problems using a variety of mathematical methods. The concepts are presented in the context of their importance for understanding of biological systems. Examples include qualitative and quantitative applications of these topics of physical

chemistry to specific biological and biomedical problems. **(3); Prerequisites:** PHY 202/222, MAT 235, CHE102/121; **Corequisite:** CHE 346

CHE 346 *Physical Chemistry I Laboratory.* This course introduces students to methods and reasoning of physical chemistry experiments. Fundamental laws, concepts and mathematical relationships that involve physico-chemical properties of matter and energy are studied in experimental setting. Modern experimental methods (including computerized data collection and treatment) are involved. Techniques of data analysis and numerical modeling are applied. Scientific communication skills are emphasized through formal report writing. **(1); Corequisite:** CHE 345

CHE 355 *Organic Synthesis.* This laboratory-based course explores advanced topics in organic synthesis with emphasis on carbon-carbon bond formation, retrosynthetic analysis of complex molecular structures, and chemo-, regio-, and stereoselectivity in organic chemical reactions. Students will apply course concepts in the laboratory by conducting multi-step synthetic sequences that include advanced techniques such as inert atmosphere conditions, analytical and preparative chromatography for purification and analysis and spectroscopic characterization of synthesized products. **(3); Prerequisite:** CHE 221

CHE 390 *Independent Study.* This course provides an opportunity for students to participate in a specialized study project under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. Students are expected to perform three hours of project related work per credit hour earned. **(1-3); Prerequisite:** permission of the instructor

CHE 415 *Medicinal Chemistry I.* This course explores the fundamental principles that define the relationship between the chemical structure and biological action of drug molecules. A major focus of the course is the application of these chemical principles to pharmacokinetics, with special emphasis on drug metabolism, and the molecular mechanisms of drug activity, drug resistance and drug synergism. **(3); Prerequisites:** CHE 311 or PSC 311

CHE 417 *Medicinal Chemistry II.* This course continues to explore the fundamental principles that define the relationship between the chemical structure and biological action of drug molecules. A major focus of the course is to study case histories of marketed and experimental drugs. An overview of the disease and the drug discovery approaches employed in drug discovery will be discussed. There will be special emphasis on drug design, metabolism, pharmacology, pharmacokinetics, and synthesis. **(3); Prerequisites:** CHE 415 or PTP 401 or PSC 431

CHE 435 *Inorganic Chemistry.* This course focuses on the structure, reactivity, and applications of inorganic compounds. Characterization methods will also be covered such as IR, UVVIS, and NMR. These compounds are found in many areas such as materials science, environmental chemistry, catalysis, bioinorganic processes, and other fields. **(3); Prerequisite:** CHE 202/221

CHE 450, 452, 454, 456, 458 and 460 *Analytical Chemistry.* The analytical chemistry sequence is offered as a series of short courses. Each course presents the use of a set of analytical techniques to solve chemical and biologically based analytical problems. The underlying scientific principles upon which the techniques are based will be used to show why it can be used as an analytical tool. Practical considerations regarding its capabilities and limitations will also be presented. Lab experiments will be performed that illustrate its use in a laboratory environment. **(variable credits shown below)**; **Prerequisites:** CHE 221

CHE 450 Analytical Chemistry - Foundations (1)
This course presents the theoretical basis upon which analytical problems are solved. The analytical process is covered in depth including discussions of: problem identification, selection of

an analytical method, sampling, sample preparation, method validations, data collection and interpretation, and reporting.

CHE 452 Analytical Chemistry - Atomic and Molecular Spectroscopy (2)
This course presents the use of atomic and molecular spectroscopy to solve chemical and biologically based analytical problems. The underlying scientific principles upon which spectroscopic techniques are based will be used to show how it can be used as an analytical tool. Practical considerations regarding its capabilities and limitations will also be presented. Lab experiments will be performed that illustrate its use in a laboratory environment.

CHE 454 Analytical Chemistry - Nuclear Magnetic Resonance (1)
This course presents the use of nuclear magnetic resonance (NMR) to solve chemical and biologically based analytical problems. The underlying scientific principles upon which NMR techniques are based will be used to show why it can be used as an analytical tool. Practical considerations regarding its capabilities and limitations will also be presented. Lab experiments will be performed that illustrate its use in a laboratory environment.

CHE 456 Analytical Chemistry - Gas and Liquid Chromatography (2)
This course presents the use of gas and liquid chromatography to solve chemical and biologically based analytical problems. The underlying scientific principles upon which these techniques are based will be used to show why it can be used as an analytical tool. Practical considerations regarding its capabilities and limitations will also be presented. Lab experiments will be performed that illustrate its use in a laboratory environment.

CHE 458 Analytical Chemistry - Mass Spectroscopy (1)
This course covers the use of MS and hyphenated MS techniques.

CHE 460 Analytical Chemistry - Miscellaneous Methods (1)
This course presents the use of titrimetric, thermal, and enzymatic methods

CHE 490 *Undergraduate Research.* This course provides an opportunity for students to obtain a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. CHE 490 is generally reserved for more advanced research projects of students with prior research experience. Students are expected to perform three hours of research related work per credit hour earned. Faculty members may expect students to present their research in venues either internal or external to the college. Students completing CHE 490 to satisfy the research requirement of the chemistry program will be expected to do so. **(1-3); Prerequisite:** permission of the instructor

CHE 623 G *Methods in Spectroscopy.* This course covers the theoretical basis of IR, NMR and UV/visible spectroscopies and mass spectrometry with applications to the elucidation of the structure and function of organic molecules. Included are examples of spectroscopic analyses of stereochemistry, conformations and kinetics with emphasis on biomedical applications such as spectroscopic investigations of drug transport and metabolism. An overview of chromatographic methods and the coupling of these methods to spectroscopic analyses will also be discussed. **(3); Prerequisite:** CHE 202/221

CHE 640 G *Medicinal Chemistry I.* This course explores the fundamental principles that define the relationship between the chemical structure and biological action of drug molecules. A major focus of the course is the application of these chemical principles to predicting the pharmacodynamics and pharmacokinetics, with special emphasis on drug metabolism, and the molecular mechanisms of drug activity, drug resistance and drug synergism. Strategies for drug development, drug and prodrug design, and pharmacologic evaluation utilizing the concepts of qualitative and quantitative structure-activity relationships, biological screening assays, combinatorial chemistry, and computer-aided modeling are discussed. **(3); Prerequisite:** CHE 202/221; CHE 312 or PSC 311 or equivalent courses

CHE 641 G *Medicinal Chemistry II.* This course continues to explore the fundamental principles that define the relationship between the chemical structure and biological action of drug molecules. A major focus of the course is to study case histories of marketed and experimental drugs. An overview of the disease and the drug discovery approaches employed in drug discovery will be discussed. There will be special emphasis on drug design, metabolism, pharmacology, pharmacokinetics, and synthesis. **(3); Prerequisite:** CHE 415/CHE 640 or PSC 431/631 or PTP 401 or equivalent courses

CHE 650 G *Bioanalytical Techniques.* The goal of this course is to understand the underlying principles, strengths, and limitations of state-of-the-art bioanalytical methods. The course is dedicated primarily to broadly biomedically-relevant instrumental methods, such as spectroscopy, chromatography, electrophoresis, and mass spectrometry. Also emphasized are more specialized biochemical and biological techniques, such as protein determination, enzyme binding, and cell-based assays. **(3)**

CLK 798 *Introductory Pharmacy Practice Experience (IPPE) – Community Pharmacy.* This experientially-based, 4 credit, required course will expose students to the basic day-to-day operations of a community pharmacy. Specific assignments have been designed to provide students with the opportunity to apply the knowledge and skills gained through classroom and laboratory instruction into an actual practice setting. Other activities involve students gaining new knowledge and skills essential to community pharmacy practice. Students will participate in and demonstrate an understanding of the "flow" of processing and dispensing a prescription medication order, evaluate medication orders for accuracy and completeness and describe the medication distribution system employed by the pharmacy. Additionally, students will participate in the promotion of health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk, targeted populations, and other members of the interprofessional team of health care providers. This course will prepare the student for their advanced pharmacy practice experiences in the fourth professional year and is a prerequisite for CLK811+. (4)

CLK 799 *Introductory Pharmacy Practice Experience Plus (IPPE Plus) – Community Pharmacy.* This experientially-based, 3 credit, professional elective course will expose students to the basic day-to-day operations of a community pharmacy and is offered on a limited basis to students who have very little or no community pharmacy work experience. The course objectives mirror the Community IPPE course objectives with emphasis on communication skills and medication knowledge. Specific assignments have been designed to provide students with the opportunity to apply the knowledge and skills gained through classroom and laboratory instruction into an actual practice setting. **(3); Prerequisites:** state issued intern permit (if required), successful completion of CIPPE (CLK ~~804~~798), and CPR certification.

CLK 803 *Introductory Pharmacy Practice Experience (IPPE) - Team Based Care.* This experientially-based, 1 credit, required course will expose students to the basic day-to-day operations of a patient care setting. Each student will have the opportunity to apply knowledge gained through didactic learning and lab by being placed in an actual practice setting. Specific assignments have been designed which require the application of classroom knowledge and skills to be further developed during these on-site training experiences. Students will gather and organize information from patient medical charts, conduct patient interviews to obtain an accurate medication history, identify medication related problems, present a patient case in a structured format (ex. SOAP note) and prepare responses to drug information inquiries. This course will prepare the student for their Advanced Pharmacy Practice Experiences in the fourth professional year. **(1); Prerequisite:** New York State intern permit or equivalent for the State in which rotation will be completed.

CLK 807 *Introductory Pharmacy Practice Experience (IPPE) - Institutional.* This experientially-based, 3 credits, required course will expose students to the basic day-to-day operations of an institutional pharmacy. Each student will have the opportunity to apply knowledge gained through didactic learning and lab by placement in an actual practice setting. Specific assignments have been designed which require the application of classroom knowledge and skills to be further developed during these on-site training experiences. Students will demonstrate an understanding of the proper procedure for preparation of intravenous products using aseptic technique, describe the "flow" of processing an order, evaluate institutional orders for accuracy and completeness and describe the medication distribution system employed by the pharmacy. This course will prepare the student for their Institutional Advanced Pharmacy Practice Experience in the fourth professional year. **(3); Prerequisite:** New York State intern permit or equivalent for the State in which rotation will be completed.

CLK 811+ *Advanced Pharmacy Practice Experiences (APPEs).* APPEs are "hands-on" experiences designed to build on the academic base obtained in the didactic portions and the IPPEs in the PharmD program. The purpose of the APPEs is to provide the student with a broad exposure to various pharmacy practice environments in order for the student to develop skills in making independent judgments and integrating fundamental knowledge into clinical applications. APPEs span a 12-month period (May-May) and are subdivided into modules; each student is required to complete seven APPE modules (42 academic credits). APPEs are scheduled by the College and typically require the student to be at the practice site at least eight hours daily Each student must complete required and elective modules as follows: Required APPEs: community pharmacy (6 weeks); ambulatory care (6 weeks); institutional pharmacy (6 weeks) and inpatient (6 weeks flexible core (ambulatory care, inpatient or community, student's choice). Inpatient and ambulatory care rotations are direct patient care rotations in settings including but not limited to anticoagulation; diabetes care/endocrinology; family practice; home care; internal medicine; nephrology; nutrition; primary care; AIDS; cardiology; critical care; geriatrics; hematology/oncology; infectious diseases; pediatrics and psychiatry. Two elective APPEs, of 6 weeks each, are required and may include direct patient care APPEs (community, ambulatory care or inpatient setting) or non-patient care APPEs such as: managed care; antimicrobial management; clinical toxicology; consultant pharmacy; drug programs management; governmental affairs/ regulatory; health information management; home infusion pharmacotherapy; long-term care; nuclear pharmacy, pharmaceutical industry; pharmacoepidemiology; pharmacy administration; pharmacy association management; pharmacy database management; pharmacy education and research. **Prerequisites:** Must have successfully completed all required didactic coursework and all IPPEs. Also, successful completion of Top 280 exam and CPR certification.

CLK 812+ *Ambulatory Care Advanced Pharmacy Practice Experience.* This required, 6- week advanced practice experience provides students with practical experience in the setting of ambulatory care. The sites available are varied and include, but are not limited to, clinics/offices in the field of diabetes; adult /pediatric medicine; oncology; home health care; neurology; nephrology; nutrition; anticoagulation and pain management. This experience introduces the student to the practical application of pharmaceutical care, enhances student abilities to identify and resolve medication related problems, refines medication information skills and provides an opportunity for the student to participate in multidisciplinary patient care in an ambulatory care setting. This experience will be offered in the P4 year. The student must have completed all required courses up to the P4 year. **(6)**

CLK 930/931 *Institutional and Inpatient Advanced Pharmacy Practice Experiences.* This required, 6-week each, Advanced Pharmacy Practice Experiences provide students with practical experience in the institutional care setting. They include all aspects of institutional practice and acute care medicine including medication distribution, patient assessment and monitoring, pharmacotherapy assessment, medication control and procurement, medication use systems, drug information services and administrative functions. **(6 each)**

CLS 307 *Urinalysis and Body Fluids.* This course covers the physiology and pathophysiology of renal function and the renal function tests including chemical and microscopic examination of urine. The theory and performance of body fluids analysis will include fecal specimens, spinal fluid and other body fluids. Clinical correlation of other laboratory results with body fluid results and patient diagnosis is emphasized. **(1); Prerequisite:** BIO 215

CLS 308 *Urinalysis and Body Fluids Lab.* This laboratory experience includes performance of analysis of urine, body fluids, fecal specimens, and semen. Laboratory safety, quality control, and troubleshooting will be emphasized. **(1); Corequisite:** CLS 307

CLS 317 *Hematology*. This course will address the evaluation of blood cells and body fluids in the clinical hematology laboratory. The lecture and laboratory will highlight physiology, pathophysiology and laboratory testing of blood and bone marrow cells, evaluation of hemostasis and hemostatic disorders and the laboratory evaluation of formed elements found in other body fluids. **(3); Prerequisite:** BIO 101/111, BIO 102/121

CLS 318 *Hematology Laboratory*. Students will perform a variety of manual and automated techniques used in both hematology and hemostasis and correlate results with hematologic disease states ranging from anemia to leukemia and including thrombotic and bleeding disorders. Emphasis is placed on problem solving experience with respect to both theoretical and practical applications. **(1); Corequisite:** CLS 317

CLS 327 *Clinical Microbiology I.* Lectures will focus on the characterization, identification and pathogenesis (if any) of commonly encountered human microbiota. This course will be organized into 5 units: 1.) virology, 2.) antimicrobial susceptibility testing and infection control, 3.) aerobic/facultative gram-positive bacteria, 4.) aerobic/facultative gram-negative bacteria, 4.) miscellaneous bacteria. This course will educate and prepare students for career as a health care practitioner utilizing the most updated clinical microbiology theory and applications. **(3); Prerequisite:** BIO 101/111, BIO 102/121

CLS 328 *Clinical Microbiology I Laboratory*. Students will perform laboratory analysis of a variety of specimens, analyze and record laboratory data, identify aerobic bacteria and sources of infection and, comply with all safety procedures, **(1); Corequisite:** CLS 327

CLS 329 *Clinical Microbiology II.* This course is a continuation of Clinical Microbiology I and will focus on mycology, parasitology and body system associated clinical specimens and infections. Lectures will focus on the characterization, identification and pathogenesis (if any) of commonly encountered human microbiota. The course will be organized into four units: 1.) anaerobic and mycobacteria bacteriology, 2.) medical parasitology, 3.) medical mycology and 4.) body system associated infections. This course will educate and prepare students for a career as a health care practitioner utilizing the most updated clinical microbiology theory and applications. **(3); Prerequisite:** CLS 327

CLS 330 *Clinical Microbiology II Laboratory***.** Students will perform laboratory analysis of a variety of specimens, analyze and record laboratory data, identify anaerobic bacteria, parasites, fungus and yeasts. Students will learn and comply with all safety procedures. **(1)**; **Corequisite:** CLS 329

CLS 337 *Clinical Immunology.* This course covers basic immunologic theory and concepts in relation to the principles and performance of procedures used in the laboratory diagnosis of infectious and immunologic disease. Specific topics include antigen-antibody reactions, complement and complement fixation, immunoassays, immunofluorescence, microbial serology and autoimmune diseases. Emphasis is placed on problem solving experience with respect to both theoretical and practical applications. **(3); Prerequisite:** BIO 101/111, BIO 102/121

CLS 338 *Clinical Immunology Laboratory*. Students will perform many of the immunologic techniques used to determine antigen and antibody specificities and contribute to diagnosis of disease states including autoimmune viral, bacterial, fungal, and parasitic diseases. Emphasis is placed on problem solving experience with respect to both theoretical and practical applications. **(1)**; **Corequisite:** CLS 337

CLS 339 *Immunohematology*. This course will apply immunologic principles to the study of immunohematology including blood groups, transfusion therapy, investigation of transfusion reactions and related pathologic mechanisms. Donor selection, blood processing and handling as well as compliance with all regulatory bodies will be emphasized. Discussion will also include other human tissues available for therapeutic and surgical use. **(3); Prerequisite**: CLS 337

CLS 340 *Immunohematology Laboratory*. Students will perform both manual and automated techniques to determine blood type, identify compatible donor blood, identify unexpected antibodies, determine hemolytic disease of the newborn and investigate transfusion reactions. Emphasis is placed on problem solving experience with respect to both theoretical and practical applications. **(1); Corequisite:** CLS 339

CLS 346 *Clinical Chemistry.* This course applies biochemical principles to the study of clinical chemistry and its application to diagnosis and treatment of patients. The significance of lipids, carbohydrates, proteins, enzymatic measurements, and acid-base balance as they apply to diagnoses of cardiovascular, pulmonary, renal and metabolic diseases is emphasized. **(3); Prerequisite:** CHE 311 or equivalent

CLS 347 *Clinical Chemistry Laboratory*. Students will perform both manual and automated techniques focused on the measurement of chemical analytes in human specimens and correlate the results with the pathophysiology of disease presentation. Emphasis is placed on problem solving experience with respect to both theoretical and practical applications. **(1)**; **Corequisite:** CLS 346

CLS 348 *Clinical Biochemical Techniques* This course covers the principles and operation of a variety of instruments used in clinical laboratories and medical research. The physical and chemical properties of matter that make measurement possible and the application of these principles to analyses involving spectral, electrochemical, chromatographic, colligative and nuclear instrumentation. The laboratory offers hands on experience with the principles and operation of a variety of instruments used in clinical laboratories and medical research. **(1); Prerequisite:** CHE 102

CLS 400 *Laboratory Management and Education.* This course educates students in the topics essential for clinical laboratory entry-level knowledge of management and operations in the current healthcare environment. Students will learn and apply principles of management & leadership, along with conflict management. Additionally, students will review to include calculations, laboratory associated finance cost/benefit analysis, budgeting, revenue generation, billing and reimbursements. Students will review topics associated with state and federal regulations including the Clinical Laboratory Improvement Act of 1988 (CLIA), human resource guidelines & regulations, employee performance evaluations and appraisals, education and training of the adult learner. Laboratory operation discussions will focus on good laboratory practice (GLP), quality assurance, performance improvement and total quality management topics, pre analytical, analytical and post analytical processing, laboratory information systems and electronic medical records. Students will review career planning strategies, professional development, resume and interviewing skills. **(3); Prerequisite:** Enrollment in CLS Program

CLS 401 and CLS 402 *Clinical Practicum I and II.* Students will participate in a number of experiential exercises in various affiliated hospital and laboratory sites. Rotations will include Clinical Microbiology, Clinical Chemistry, Immunohematology, Hematology and Coagulation, Immunology/Serology and Molecular Diagnostic testing. The clinical practicum experience will include specimen tracking, performance of routine analyses,

demonstration of specialty testing, observation of automated instrumentation and management processes, including quality control and quality assurance activities. **(9 each); Prerequisite:** Completion of all CLS 300 level courses

CLS 410 *Clinical Correlations.* Through case study and extensive literature review, this course is the culmination of the CLS curriculum. The results of testing in all laboratory disciplines are applied to the diagnosis of the patient, the resolution of pre-analytic, analytic and post-analytic issues and the appropriate management of the clinical laboratory.**(3); Corequisite:** CLS 402

CLS 610 G *Clinical Microbiology I (formerly CLS 550 G).* Lectures will focus on the characterization, identification and pathogenesis (if any) of commonly encountered human microbiota. This course will be organized into 5 units: 1.) virology, 2.) antimicrobial susceptibility testing and infection control, 3.) aerobic/facultative gram-positive bacteria, 4.) aerobic/facultative gram-negative bacteria, 4.) miscellaneous bacteria. This course will educate and prepare students for career as a health care practitioner utilizing the most updated clinical microbiology theory and applications. **(4); Prerequisite:** BIO 101/111, BIO 102/121 or equivalent

CLS 620 G *Clinical Microbiology II (formerly CLS 560 G).* This course is a continuation of Clinical Microbiology I and will focus on mycology, parasitology and body system associated clinical specimens and infections. Lectures will focus on the characterization, identification and pathogenesis (if any) of commonly encountered human microbiota. The course will be organized into four units: 1.) anaerobic and mycobacteria bacteriology, 2.) medical parasitology, 3.) medical mycology and 4.) body system associated infections. This course will educate and prepare students for a career as a health care practitioner utilizing the most updated clinical microbiology theory and applications. **(4); Prerequisite:** CLS 610 G

CLS 630 G *Clinical Immunology (formerly CLS 530 G).* The content of this course includes development of the immune system, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex and antigen presentation, and immune responses to infections organisms and tumors. The lecture and laboratory will focus on diagnostic techniques employed in the identification of viral and bacterial diseases and the diagnosis of autoimmune diseases, allergies, immune deficiencies and AIDS. **(4); Prerequisite:** Graduate standing or permission of instructor

CLS 640 G *Clinical Chemistry (formerly CLS 540 G)*. This combined lecture/laboratory course focuses on basic concepts of laboratory instrumentation, troubleshooting techniques and the operation, evaluation and selection of instruments. Lectures emphasize chemical measurements of physiologic indicators of normal and abnormal human metabolism and address the elements of clinical chemistry and its application to diagnosis and treatment of patients. The significance of lipids, carbohydrates, proteins, enzymatic measurements, acid-base balance as they apply to diagnoses of cardiovascular, pulmonary, renal and metabolic diseases is emphasized through hands-on measurement and correlation with pathophysiology. **(4); Prerequisite:** CHE 311 or equivalent

CLS 650 G *Clinical Hematology and Hemostasis (formerly CLS 520 G)*. This course will address the evaluation of blood cells and body fluids in the clinical hematology laboratory. The lecture and laboratory will highlight physiology, pathophysiology and laboratory testing of blood and bone marrow cells, evaluation of hemostasis and hemostatic disorders and the laboratory evaluation of formed elements found in other body fluids. **(4); Prerequisite:** Graduate standing or permission of instructor

CLS 655 G *Urinalysis and Body Fluids (formerly CLS 525 G).* This course includes the medical biochemistry of renal function and the interpretation of urinalysis and body fluid (spinal fluid, seminal fluid, and other body fluids) testing. Emphasis is on clinical significance and interpretation of laboratory results, specimen collection

and preservation, biochemical test procedures, clinical microscopy and cytology of urine sediment. **(2); Prerequisite:** BIO 215 or equivalent

CLS 660 G *Immunohematology (formerly CLS 535 G)*. Immunohematology is the laboratory application of immunologic principles to the identification of appropriate blood and blood products for transfusion and body tissues for transplant. The course will cover characteristics of red cell and white cell specific antigens, donor qualification and blood processing as well as the techniques for identification of auto- and allo-antibodies important to transfusion medicine and transfusion service specific regulations and quality control requirements. **(4); Prerequisite or Corequisite:** CLS 630

CLS 760 G *Clinical Correlations (formerly CLS 690).* Students will evaluate a series of case studies which integrate all disciplines of laboratory diagnostic medicine. The cases will require knowledge of laboratory test result normal, factors that affect the accuracy of laboratory test results, quality management principles, and the ability to integrate diverse information to arrive at a diagnosis, corrective action or quality improvement recommendation. **(3); Corequisite:** CLS 780.

CLS 770 G / 780 G *Clinical Practicum I and II (formerly CLS 670 G; CLS 680 G).* Students will participate in a number of experiential exercises in the affiliated hospital and laboratory sites. Rotations will include Clinical Microbiology, Clinical Chemistry, Immunohematology, Hematology and Coagulation, Immunology/Serology and Molecular Diagnostic testing. The clinical practicum experience will include specimen tracking, performance of routine analyses, demonstration of specialty testing, observation of automated instrumentation and management processes, including quality control and quality assurance activities. **(9 credit per semester); Prerequisite:** Completion of all required CLS 600 level courses

CMP 115 *Introductory Excel.* This course provides an introduction to health analytics using Microsoft Excel spreadsheet software. Topics include worksheets and workbooks, functions, tables, templates, charts/diagrams and data analysis. Application to health related data will be included to illustrate the use of Excel as a tool in health and healthcare settings. **(2)**

COM 101 *Academic Reading and Writing.* This course introduces students to critical writing and reading in academic contexts and offers them the opportunity to develop essential skills in comprehending, analyzing and evaluating college-level texts; effectively addressing writing assignments; inventing, drafting and revising; and seeking, providing and responding to constructive feedback. Through multiple writing activities and individualized coaching, students are presented with and practice the fundamentals of academic communication such as synthesizing multiple sources, sustaining a coherent argument and revising for clarity of style. Special attention is paid to conventions of standard written English. **(3)**

COM 102 *Group Communication.* This hybrid course (½ online and ½ face-to-face) is introductory and designed to provide basic understanding of the group dynamic and process. Critical facets of group functioning are studied and experienced to apply key concepts that are relevant to group development, team building, roles, problem-solving, and leadership. These concepts will be examined in a variety of group settings to help students understand critical events which occur in both large and small cohorts. **(3)**

COM 105 *Workshop in English as a Second Language*. This ESL Workshop provides one to one or small group support to students for whom English is a second language and have proficiency in English, but who require some specialized study to accompany their current courses. The course provides practice and instruction in the writing process, conventions of academic genres and English grammar and usage. The course is designed as a workshop to support students with the writing they are doing in an elective or required course such as

Academic Reading and Writing, Principles of Communication, or the Humanities sequence. This course may be repeated for credit up to three times. **(1)**

COM 115 *Principles of Communication.* This course is aimed primarily toward introducing students to academic literacy practices, including reading, writing, researching and using sources, speaking, collaborating with peers and using visuals. Students will establish a solid communication skill set to serve as a foundation for the rest of their academic and professional career. In addition, students also will engage in activities to understand both the basic principles and processes of communication, as well as the tools that make communication possible. **(3)**

COM 120 *Introduction to Public Speaking (formerly LAS 241).* This interactive, workshop-style course introduces students to the core communication skills required for effective public speaking. Students will learn to design and present messages in two primary genres: speaking to inform and speaking to persuade. Specific skills/topics to be addressed include: verbal and nonverbal delivery mechanics, managing speech anxiety, grabbing attention, organizational structures, language style, Powerpoint design and usage, audience analysis, and job interviewing skills. In addition to scripted messages, students will develop confidence with extemporaneous (improvisational) speaking. **(3)**

COM 150 *Introduction to Journalism (formerly LAS 144).* This course is designed to introduce students to the basic concepts of journalism by exploring and evaluating issues and events occurring during the college years. Students will write at least four articles for Mortar and Pestle each semester. This course may be taken three times, giving a sense of continuity to the newspaper and enabling students to earn a total of three liberal arts credits. **(1)**

COM 171 *American Sign Language I.* Level 1 is an introductory level course for students with little or no prior experience in Sign Language. Expressive and receptive sign skills will be addressed as well as the manual alphabet for fingerspelling, basic grammatical structures, and how to develop vocabulary through sign production. The students will also learn about various forms of sign language and deaf culture. Class time will be devoted in developing basic conversations and the skills will be practiced in whole group discussions as well as small group exercises and discussions. Signs skills will also be enhanced outside the classroom through grammar and comprehensive exercises. **(3)**

COM 172 *American Sign Language II.* Expressive and receptive sign skills will be addressed as well as the manual alphabet for finger spelling, basic grammatical structures, and how to develop vocabulary through sign production. The students will also learn about various forms of sign language and deaf culture. Class time will be devoted in developing basic conversations and the skills will be practiced in whole group discussions as well as small group exercises and discussions. Signs skills will also be enhanced outside the classroom through grammar and comprehensive exercises. **(3); Prerequisite:** COM 171

COM 175 *Academic Writing and Presentations for ESL I*. This course is designed for nonnative English speakers who are proficient in English but need to improve their academic writing and presentation skills. Students will gain confidence in academic writing and speaking in order to increase fluency and proficiency. The course will also enable students to develop a practical understanding of the conventions of academic writing and presentations. Students will also have opportunities to work with and get feedback on writing and presentation assignments in other courses. **(3)**

COM 211 *Spanish for Health Careers I.* The Spanish for Health Careers I and II sequence will provide students with specific vocabulary, grammar and cultural competencies that will be directly applicable to interaction with Spanish-speaking clients within a health care context. Particular emphasis will be placed upon the building of speaking/listening communication skills. Students will primarily communicate in the present tense and will be

introduced to expression in the past tense. As the Spanish for Health Careers I Course is an introductory level language course, previous knowledge of Spanish will be helpful but not necessary. **(3)**

COM 212 *Spanish for Health Careers II:* The Spanish for Health Careers II is the second course in the sequence that provides students with specific vocabulary, grammar and cultural competencies that will be directly applicable to interaction with Spanish-speaking clients within a health care context. **(3); Prerequisite:** COM 211 or permission of the instructor

COM 230 *Overcoming Communication Hurdles in Health Care (formerly LAS 251).* This course addresses the development of students' reading, writing, speaking and listening abilities. Through a mix of mini-lectures, workshops and active learning activities, students are presented information fundamental to understanding communication as a critical element in the delivery of health care. Through case studies, individual and group assignments, students will apply the communication strategies presented in class to situations of increasing rhetorical complexity and personal responsibility. **(3); Prerequisite:** COM 115

COM 242 *Interpersonal Communication (formerly LAS 242).* This course introduces students to the social scientific discipline of interpersonal communication. Interpersonal communication provides the building blocks from which all larger forms of social organization are created and maintained. Friendships, intimate relationships, families, football teams, juries, hiring committees, PR firms, hospitals, political campaigns, and governments all rely at some level on interpersonal communication. The course is divided into two large units. The first unit covers foundational theories in the area of interpersonal communication. The second unit covers what might be considered "problematic" aspects of interpersonal communication (e.g. conflict, deception, social predicaments). Throughout the course, concepts from interpersonal communication are applied to different health care settings, demonstrating how interpersonal dynamics affect the delivery and receipt of health care. **(3); Prerequisite:** COM 115

COM 251 *Communication and Conflict.* This course offers a broad overview of the study of conflict from a communication perspective. It introduces students to current theoretical and applied issues in the study of conflict management using social science theories to help explain the process of interacting with others. Specifically, the course examines the nature, causes, and techniques for managing conflict across a wide variety of situations including societal clashes, psychological turmoil, group decision-making, intimate relationships, and organizational interaction. While each of these situations differs in important ways, there are commonalities in how conflict functions across them. We will look at those commonalities to understand the role of communication in conflict. The assignments and class activities focus upon the theories, models, principles, and concepts of conflict and their application to a variety of relationships. **(3); Prerequisite:** COM 115

COM 310 *Persuasion and Social Influence*. Persuasion and Social Influence provides an overview of classical and contemporary approaches to persuasion with an emphasis on health issues. Persuasion principles are fundamental to the field of Health Communication. The class focuses on both persuasion theory and the application of theory to health related issues. It is valuable to understand how persuasion principles operate in all facets of health care, for example audience analysis and evaluation for health campaigns, pharmaceutical advertisements, and interpersonal influences on health behaviors. You will become informed producers and critical consumers of persuasive messages by the end of this course. **(3)**

COM 312 *Health Promotion*. This course combines theoretical approaches to persuasion and behavior change with applied, experiential learning to provide students with the knowledge and skills to promote health initiatives in a variety of communication media. **(3); Prerequisites**: COM 115, COM 120

COM 315 *Health Campaigns.* Communication campaigns play an important role in public health and safety. The overarching goal of this course is to examine strategies and outcomes of informative and persuasive health communication campaigns. The course will first provide an overview of the history of campaigns, audience analysis, formative research, theory, design, and evaluation, and second, examination of specific health campaigns. This course will include a hands-on group project designing and implementing a health message intervention that will give students practical experience and will allow students to develop professional communication and teamwork competencies. Principles covered in this course are fundamental to the field of Health Communication. **(3); Prerequisite:** Junior standing or permission of the instructor

COM 320 *Patient-Provider Communication.* A great deal of health care is delivered interpersonally. When health providers and health consumers interact, they coordinate their social and communicative activities in order to realize the practical goals of a therapeutic partnership. This course exposes students to a range of communicative challenges that health providers and health consumers experience when they interact. Various communication strategies for overcoming these challenges will be discussed and evaluated. Applying an ecological perspective on health care, relationships between macro-level factors (culture, gender, economics) and micro-level factors (interpersonal relationships, interaction) will be discussed. **(3); Prerequisite:** Junior standing or permission of the instructor

COM 330 *Intercultural Communication in Healthcare*. Modern health care systems require practitioners to provide care to patients with diverse values, beliefs, experiences, and behaviors. This course exposes students to the communication challenges that patients and providers navigate as part of an intercultural therapeutic partnership, with special emphasis on the ways in which health care delivery can be tailored to patients' unique social, cultural, and linguistic needs. The course uses the term "culture" broadly and inclusively, highlighting traditional racial/ethnic cultures (e.g. Middle Eastern), national cultures (e.g. Mexican) and co-cultures (e.g. African American), while also including contemporary notions of cultural membership (e.g. cultures of medicine, cultures of disability, LGBTQ). Key topics include: minority health disparities, health literacy, barriers to health care access, cultural variations in communication style, the use of medical interpreters, traditional and complementary medicine, and culturally-specific media environments that influence health beliefs and behaviors. **(3); Prerequisite:** Junior standing or permission of the instructor

COM 339 *Professional and Technical Writing.* This hybrid course (½ online and ½ face-to-face) addresses the development of students' writing abilities through a mix of mini-lectures, workshops and active learning activities. Students are presented information fundamental to understanding written communication as a critical element in the delivery of health care. Through case studies, individual and group assignments, students will apply the rhetorical strategies presented in class to situations ranging from the general to discipline/profession specific. **(3); Prerequisite:** COM 115

COM 350 *Qualitative Research Methods*. This workshop-style course provides training and applied experiences with qualitative methods used in the social sciences, including in-depth interviews, focus groups, participant observation, and discourse analysis. The key philosophical assumptions of qualitative research, as well as the complementarity of qualitative and quantitative methods, will be emphasized. Using a team-based approach, students will collect and analyze original data, as well as publicly available data sources. At the end of the course, teams will present their findings in an academic manuscript and in a formal presentation. **(3); Prerequisites**: SOC 301, 3rd year standing

COM 390 *Independent Study in Communication*. This is a mentor-student proposed elective course project focused on communication. The student under faculty advisement must submit a proposal to the Department Chair for approval. **(1-3); Prerequisite:** permission of the instructor

CYT 610 G *Cytopathology of Female Genital Tract (FGT) (formerly CYT 510 G).* This course will present the basic principles of Cytopathology applied to the cellular samples obtained from the female reproductive system. Topics covered are the gross and microscopic anatomy, physiology and pathology of the cervix. This course will establish a foundation for identifying and understanding the basic epithelial cell types. Benign, reactive, and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Pre-malignant and malignant conditions will be discussed and identified on cytologic specimens obtained primarily from the Pap Test. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. In the laboratory, students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from the FGT that demonstrate a wide variety of benign to malignant conditions. **(4); Prerequisite:** BIO 215, BIO 216, BIO 235 or equivalent; *Lecture and Laboratory*

CYT 620 G *Exfoliative Non-Gynecologic Cytopathology I (formerly CYT 520).* This course will present the basic principles of cytopathology applied to the cellular samples obtained from a variety of body sites through brushings, washings and scrapings. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the respiratory tract and gastrointestinal tract will be examined. This course will expand on the foundation for identifying and understanding the basic epithelial cell types that began in Cytopathology of the Female Genital Tract (FGT). Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance on a variety of cytologic specimens will be explored. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. In the laboratory, students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. **(2); Prerequisite:** CYT 610; *Lecture and Laboratory*

CYT 630 G *Exfoliative Non-Gynecologic Cytopathology II (formerly CYT 530 G).* This course will present the basic principles of cytopathology applied to the cellular samples obtained from a variety of body sites through brushings washings and scrapings. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the genital urinary system, body cavity fluids and cerebral spinal fluid will be examined. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance on a variety of cytologic specimens will be explored. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. In the laboratory, students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. **(2); Prerequisite:** CYT 610, CYT 620; *Lecture and Laboratory*

CYT 640 G and CYT 650 G *Cytopreparatory Techniques I and II (formerly CYT 540 G; CYT 550 G).* These courses will develop the skills necessary to prepare a wide variety of specimens. It will also teach students how to select and apply the appropriate staining technique for each specimen. Techniques for fine needle aspiration procedures and immediate adequacy assessments will be explored. Students will learn various aspects of laboratory management and how to comply with all State, OSHA and Federal regulations in a working laboratory. Emphasis will be placed on safe, efficient and effective handling techniques. Students will make a collection of representative slides from a variety of body sites using expired specimens donated from clinical affiliates. **(1 each); Prerequisites:** Bio 214, BIO 216, BIO 235 or equivalent

CYT 660 *Fine Needle Aspiration Cytology I (formerly CYT 560).* This course will present the basic principles of cytopathology applied to the cellular samples obtained through fine needle aspiration (FNA) from a variety of body sites where lesions can be identified by radiological techniques. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the liver, pancreas, kidneys, adrenal

glands, ovaries and lymph nodes will be examined. The course will also include FNA of unusual lesions, including: mediastinal lesions, bone and soft tissue lesions and pediatric tumors. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance will be explored. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. In the laboratory, students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. **(3); Prerequisites:** CYT 610, CYT 620 and CYT 630; Lecture and Laboratory

CYT 670 *Fine Needle Aspiration Cytology II (formerly CYT 570).* This course will present the basic principles of cytopathology applied to the cellular samples obtained through fine needle aspiration (FNA) from a variety of body sites where lesions can be identified by radiological techniques. Gross and microscopic anatomy, physiology and pathology of these sites will be explored. Specimens from the breasts, thyroid gland and salivary glands will be examined. Benign, reactive and infectious conditions will be discussed. Infectious organisms and the cellular changes they produce will be identified. Atypical and malignant conditions and their cellular appearance will be explored. Cellular changes induced by therapies and environmental entities will be examined and criteria to identify these will be discussed. In the laboratory students will learn in an experiential setting by examining both pre-diagnosed and unknown cases from these sites that demonstrate a wide variety of benign to malignant conditions. **(3); Prerequisite:** CYT 660; Lecture and Laboratory

CYT 770 G *Clinical Practicum I (formerly CYT 590 G).* This course consists of two clinical rotations, the first one lasting seven weeks and the second for one week at two different clinical affiliate laboratories. Students rotate one week in a laboratory that deals with adjuvant methodologies such as molecular diagnostics, flow cytometry or proteomics. Students "shadow" a teaching cytotechnologist through their daily routine and participate in all laboratory activities as permitted. Students are expected to pre-screen cases that will later be re-screened by the teaching cytotechnologist, participate in preparation and staining of specimens, and any FNA, Tumor Board, Tissue Correlation and Patient Follow-up activities that their teaching cytotechnologist deems appropriate. **(3); Prerequisite:** CYT 670

CYT 780 G *Clinical Practicum II (formerly CYT 600 G).* This course is a continuation of CYT 770 with two clinical rotations, scheduled as described for CYT 770. **(6); Prerequisite:** CYT 770

ECN 101 *Introduction to Economics.* The course covers basic economic principles applied to current social issues and problems. Topics covered will typically include inflation, unemployment, wage and price controls, welfare, social security, national debt, health programs, food prices, pollution, crime, mass transit, revenue sharing, multinationals, population, and energy. This course will prepare students to master fundamental economic concepts, applying tools (graphs, statistics, equations) to the understanding of operations and institutions of economic systems. Students will study the basic economic principles of micro and macroeconomics, international economics, comparative economics systems, measurement and methods. **(3)**

ECN 317 *Health Economics.* In this course, we will learn how to apply economic tools to the study of health and medical care issues. We will examine the special features of medical care as a commodity, the demand for health and medical care services, the economic explanations for the behavior of medical care providers (i.e., physicians and hospitals), the functioning of insurance markets, and technology diffusion. Our discussions will touch on current policy topics such as the prospective payment system, relative value scales, insurance reform, rationing, and price regulation. We will also be examining the role of and economic justification for government involvement in the medical care system. Finally, we will use the tools we have learned to review and analyze various proposals for health care reform. **(3)**

ECN 325 *Econometrics.* This course introduces students to multiple regression methods for analyzing data in economics and related disciplines. Extensions include regression with discrete random variables, instrumental variables regression, analysis of random experiments and quasi-experiments, and regression with time series data. Accordingly, the emphasis of the course is on empirical applications. **(3)**

ETH 305 *Provost's Honors Circle Seminar I.* This year-long three credit course is divided into two semesters, with the first semester consisting of one credit hour/ week and the second semester consisting of two credit hours/ week. As a hybrid course, the second semester will entail more online-time. The first semester focuses on diseases/ illnesses and our understandings and perceptions of them. Students will investigate the portrayal of a health problem in literature, film, and social media. **(1); Prerequisite**: Member of Provost's Honors Circle

ETH 306 *Provost's Honors Circle Seminar II*. This year-long three credit course is divided into two semesters, with the first semester consisting of one credit hour/ week and the second semester consisting of two credit hours/ week. As a hybrid course, the second semester will entail more online-time. The first semester focuses on diseases/ illnesses and our understandings and perceptions of them. The second semester focuses on some of the power disparities that exist in health care; we will consider cross-cultural, racial and ethnic, and global and environmental issues. **(2); Prerequisite**: Member of Provost's Honors Circle

ETH 310 *Bioethics (formerly LAS 225).* In this course students consider the impact of modern medical technology, including drugs, on matters of ethics and policy. The course focuses on reading and application of ethical theory, as it applies to critically understanding and improving morally-grounded clinical care. Special consideration is given to how personal and professional identities shape our ethical duties and responses, through reading feminist perspectives on ethics. Topics will vary, but may include genetic counseling, reproductive ethics, end-of-life care, do-not-resuscitate orders, informed consent in treatment and in research, the right to refuse treatment, the allocation of scarce medical resources, and ethical problems of the clinic versus public health. In addition, we make use of case studies, occasionally films, and/or presentations with expert guests. **(3); Prerequisite:** Junior standing or permission of the instructor

ETH 315 *Health, Disease, and Authority in Medicine*. Modern medicine has relied heavily upon scientific authority to make factual claims about health and disease. Providing good medical care, however, involves knowing more than "just the facts." This class is an opportunity to think carefully about biomedicine's proper role in defining core medical and public health concepts like health, disease, and illness. What is the proper role of technology in health care? How do medicalized systems shape what we can know and how we can act? What are the basis and limits of clinical diagnoses? What authority do patients have to speak about their own health conditions? How do answering these questions improve our ability to provide morally grounded patient care? **(3); Prerequisite:** Junior standing or permission of the instructor

ETH 320 Research Ethics Workshop. Examining ethical issues arising from research in biomedicine and science and focusing on research ethics is essential for public health and social science students. This class will introduce and analyze ethical issues as related to scientific research. **(1); Corequisite**: SOC 301

ETH 410 *Special Topics in Bioethics.* This reading-intensive seminar will focus on philosophical theory and its applications to contemporary problems in medicine, science, and technology. Our rigorous group investigation of active moral problems and philosophical questions will draw from both modern and historical texts. Topics will vary based on the instructor's and students' needs and interests. Please note: this is not intended to be an overview course in ethics; instead, we will read deeply around a focused set of topics. **(3); Prerequisite:** Junior standing or permission of the instructor

ETH 510 *Health Care and Human Values (formerly LAS 611).* This capstone experience involves readings from literature and current publications that deal with ethical issues in health care and medical research. This

course exposes the students to theories of ethical decision making and to works that treat such topics as the responsibilities of the scientist, the use of drugs in our society, cultural communication gaps in health care, health care in the developing world, and euthanasia. It provides students with the opportunity to explore the ethical dimensions of these topics in written and discussion form. **(3); Prerequisite:** P3 in the PharmD program or permission of the instructor

ETH 610 G *Ethics in Research (formerly PSC 671).* This course includes a discussion format based on ethical issues involved in the research process. Students will have focused reading on the ethical theory and its application to issues involved in research. This involves close readings, case studies, and in-class discussions. Topics covered will include, but are not limited to, ethical theories as applied to research ethics, ethical issues before research committees, ethical issues involving human and animal subjects, reporting of research, conflict of interest, and the creation of scientist as ethical agents. **(1)**

GEN 141 *Introduction to Law.* This course will introduce students to various aspects of the legal system in the United States. Students will understand the history that formed the foundation for American law and the administration of justice, including a review of Constitutional Law and the evolution of the Supreme Court's review of the Amendments over time. Legislative, Judicial, and Administrative processes will be reviewed. Students will distinguish between civil and criminal cases, review landmark decisions of the U.S. Supreme Court, and study various areas of law in detail including Criminal Law & Procedure, as well as various types of Civil Laws & Procedure, including Family Law, Matrimonial Law and Torts. **(3)**

GEN 245 *Budo and Sado (formerly LAS 245).* Japanese Martial Arts and the Way of Tea. This course will explore the relationship between Budo (the Japanese martial arts) and Sado (the Way of Tea). Sado is also known as Cha-no-yu or the Tea Ceremony in English. The commonalities and the unique aspects of these disciplines will be examined along with their relevance to modern life. The historical context and cultural milieu of these arts will be considered, particularly with respect to their significance in personal growth and development. Zen Buddhism is a significant part of the foundation of both Budo and Sado and a portion of the course will be allocated to reviewing the tenets of Zen and its training methods. Most importantly, students will undergo significant experiential practice in the physical aspects of various Budo and in the Japanese Tea ceremony (the preparation and drinking of ma-cha or powdered green tea). Approximately half of each week's class time will be allocated to discussion of assigned readings and articles and the other half will be experiential. **(3); Prerequisite:** HUM 102

HHS 401 *Health and Human Sciences Capstone*. The Capstone Experience should be a health related, project or applied experience that synthesizes your training at ACPHS with practical, real-world experiences. One applied public health clinical, research, or community-based experience is required during the senior year. Students can choose to complete the Capstone Experience over 1 or 2 semesters in their senior year at ACPHS and can pursue between 3 and 6 academic credit hours. Students must complete status updates throughout the semester, must present their projects/papers/experiences back to the HHS community at ACPHS, and complete a brief evaluation of their experience. **(3); Prerequisite:** Senior standing in the Health and Human Sciences Program or permission of the instructor

HIS 110 *American Government.* This introductory course is designed to familiarize students with the concepts, principles, procedures, institutions and conflicts essential to American government and politics. The course is divided into four parts: The first part focuses on the basic features of our constitutional structure: the separation of powers, federalism, checks and balances, and limited government. The second part concentrates on the political inputs: public opinion, political parties, and interest groups. The third deals with the three branches of government: Congress, the President, and the Supreme Court. The fourth part focuses on the policy outputs of government, both domestic and foreign. The course will place an emphasis on health policy. **(3)**

HIS 115 *American Frontier (formerly LAS 278).* This course analyzes the concept of the frontier in French, Spanish and English colonial histories and how those merged into the United States frontier. Students will explore the mythological icon of the frontier in American history as well as specific political, environmental, and gender elements of the European, Euro-American and Native American frontiers. Last, students will explore water rights, urbanization, the Dustbowl and other elements of the American West, the region most associated with "the Frontier." **(3)**

HIS 120 *Native Americans Through Their Own Eyes (formerly LAS 275).* This course addresses Native American history and literature from the perspective of native writers and historians. What are the major issues from their vantage? Has the native concept of "history" and "literature" changed since the advent of literacy? Can only natives write about their communities, and, if so, how does a member of one tribe gain consent to write about another tribe with a different culture? Lastly, what do these writers and historians see as the future of their people? **(3)**

HIS 125 *Southwestern American Indian History (formerly LAS 239).* In this course, students study various elements of Southwestern Indian culture and history from prehistoric times to the modern era. This is a history rather than an anthropology class, but various elements of Native Southwestern culture and society will be incorporated within the historical narrative. **(3)**

HIS 130 *The Indian in American History (formerly LAS 913).* This course examines how Native American peoples came to the continent (examined through their own myths and modern anthropological interpretations) and the cultures that developed before 1492. The bulk of the course examines chronological historical interaction between Europeans and natives after 1492 and the way this affected the cultures of both groups. **(3)**

HIS 140 *Early American History.* The course examines the history of areas that came to compose the United States by 1840, using the East Coast, Southwest and Gulf Coast as areas of emphasis. The majority of the course will be devoted to the formation of the "United States of America" along the Atlantic coast and the westward progression of that country across the North American continent. As a class we will examine the major cultures, demographies, military conflicts, and political and religious structures which shaped the growth of the US before 1840. This course stresses historical content but, just as important, hones critical thinking skills concerning how we as Americans interpret history. **(3)**

HIS 141 *Modern American History.* The course examines the history of the United States from 1877 to the present. As a class we will examine the major cultures, demographic shifts, military conflicts, and political and religious structures that shaped the United States during that time. The course stresses historical content but, just as important, hones critical thinking skills concerning how we as Americans interpret history. We will utilize a history text but supplement that not only with primary documents that reflect how people of the time felt about the points we discuss, but also secondary articles interpreting historical events from a modern perspective. Since ACPHS emphasizes health care, a large part of our readings and class discussion will focus on health-related topics, such as the effect Spanish flu had on the United States and the world during the WW I era, or how American reaction to the polio epidemic reflects Cold War policies and attitudes. **(3)**

HIS 210 *Hitler's Empire (formerly LAS 134).* This course examines Germany, Europe and the world as they were shaped or influenced by Adolf Hitler and the National Socialist movement. Among the issues examined: the historical and cultural factors that account for the rise of National Socialism; the extent to which Hitler's personality shaped National Socialist policy and practice; Nazi racial policies and the Holocaust; the economy of and everyday life in the Third Reich; the foreign policy of National Socialism; the role of the S.S. in the Nazi state and the long-term impact of the National Socialist experience on German and world history. **(3);** **Prerequisite:** HUM 102

HIS 215 *Vietnam War (formerly LAS 891).* This course examines America's most controversial- war: its background, course and conclusion; the war on the battlefield and the war at home; and the costs and consequences for both the United States and Vietnam. The course will examine fiction, journalism, historical analysis, political theory, film and popular music. **(3); Prerequisite:** HUM 102

HIS 220 *Era of the Russian Revolution (formerly LAS 330).*This course examines the rise, dominance and decline of Soviet Communism in the 20th century. Students study the economic, political and social conditions that led to revolution; the ideologies that spurred men and women to action; the personalities involved; the nature of the Communist state that resulted; the reaction of the rest of the world; the revolutions of the 1980s and 1990s and the future of Communism. The focus is on careful analysis and discussion of literature, films, music and art – vehicles for understanding communism and Russian life and culture. **(3); Prerequisite:** HUM 102

HIS 225 *The American Civil War (formerly LAS 265).* This course offers an introduction to the bloodiest war in American history: the Civil War. The course examines the differences that led to the conflict; the social, political and economic characteristics of the North and South; the nature of the war; emancipation and its consequences; conditions on the home front; the Reconstruction era after the war; and how American memory of the war over the past 140 years has helped to define and shape the nation that the United States is today. **(3); Prerequisite:** HUM 102

HIS 230 *America in a Global Context*. This course explores the relationships between the United States and such regions of the world as the Caribbean, South America, Africa, East Asia, the Pacific Rim, Europe, and North America. Emphasis is on social, cultural, political, and economic interactions over the past two centuries and in the contemporary world. The goal of the course is to illustrate how the United States has always been part of the world, and, at the same time, how the world has always been part of the United States. **(3)**

HIS 310 *International Relations (formerly LAS 127).* This course examines the changing nature of power in world politics since the end of World War II. Topics include the causes of international conflict, the consequences of international economic competition, ecology, human rights and international law, the future of the individual nation-state and regional and global government, global ideologies of the future and the "hot spots" of the world – today and in the near future. Students are required to develop and maintain a working familiarity with current developments around the globe. **(3); Prerequisite:** HUM 201

HIS 315 *Modern American Foreign Policy (formerly LAS 131).* This course examines the theory and practice of foreign policy as conducted in the United States in the post-World War II/post-Cold War eras. Topics include historical traditions of U.S. foreign relations, the role of the presidency, Congress and non-governmental organizations in making and influencing foreign policy, concepts of national security and national interest, war as an instrument of foreign policy, the constitutional and legal bases of U.S. foreign policy and contemporary problems in U.S. foreign policy. **(3); Prerequisite:** HUM 201

HIS 320 *American National Character (formerly LAS 333).* In this course we look into some of the works, from Tocqueville's Democracy in America to Bellah's Habits of the Heart, in which travelers, novelists and social scientists have tried to describe, explore and explain the uniquely American character. **(3); Prerequisite:** HUM 201

HIS 325 *History of the Plagues.* The course examines the history and literature of four plagues: the bubonic plague, the "virgin soil" epidemics of the Americas, the Spanish flu, and AIDS. We will look at physical causes of the diseases, immediate cultural responses, and the way these plagues produced long-lasting effects on local and global cultures, politics, and demographics. **(3); Prerequisites:** HUM 102, COM 115

HIS 330 *History of Public Health and Medicine*. This course explores the history of public health and medicine in America from the early colonial period to the present. The course will address the key factors that have contributed to the decline in mortality and rise in life expectancy in the United States. Finally, the course will examine the impact that the United States has had upon public health across the globe. **(3); Prerequisite:** 3rd year standing or permission of the instructor

HOI 610 G *Quantitative Regression Analysis (formerly PAD 725 G Econometrics)*. This course introduces students to multiple regression methods for analyzing data in economics and related disciplines. Extensions include regression with discrete random variables, instrumental variables regression, analysis of random experiments and quasi-experiments, and regression with time series data. Accordingly, the emphasis of the course is on empirical applications. **(3)**

HOI 615 G *Health Outcomes (formerly PAD 615 G).* This course will provide students with an introduction to the principles and techniques of pharmacoeconomics and health outcomes evaluation, and to the methodologies used by decisionmakers and stakeholders to draft and implement health policy. It builds on the economic principles presented in health economics (US and Global Health Care Systems) to describe the major components of the current U.S. healthcare system. Building on that foundation, the course introduces the techniques used for evaluation of health care interventions. These methods provide the basis for measuring and assessing the economic and non-economic consequences of healthcare interventions, emphasizing drug therapy, and pharmaceutical services. Examples of some of the economic methods introduced include:cost of illness analysis, cost-minimization, cost-effectiveness analysis, cost-benefit analysis, and decision analysis. Non-economic measures discussed include general and disease specific quality-of-life (QOL) assessments and health status measurement. Students will demonstrate the ability to critique published studies which use pharmacoeconomic or health outcomes techniques, assessing the quality of the research and drawing relevant conclusions. **(3)**

HOI 625 G *Health Systems (formerly PAD 675 G)*. This course presents a systematic comparative analysis of the evolution, administrative structure, finance, and provision of medical care in selected countries throughout the world. Equity/inequity and the current and looming effects of globalization will be explored. This course will expand your understanding of health and illness by looking at them as socio-cultural and socio-economic phenomena. Important differences rooted in culture, ethnicity, social, economic and political factors will be examined to encourage innovative "framing" of U.S. health public policies. This course presents and facilitates the development of an analysis of major health service delivery and management issues from an international perspective. Each country in the world possesses and implements a unique health service delivery system. While there may be many factors, components and issues in common, there are nonetheless many differences. It is important to learn about and analyze other country's healthcare systems, to learn how they treat similar issues and to discover innovations. Improvement often comes through change and innovations, and this study will not neglect the opportunity to learn from others, especially those middle and lower income countries implementing interesting and innovative reforms. By utilizing a comparable model of exploration, we will gain an understanding of the similarities and differences of industrial countries, third world countries and tribal programs in the US. **(3)**

HOI 635 G *Statistical Programming (formerly PAD 636 G)*. The goal of this course is to introduce students to the use of the SAS programming language for analysis of health outcomes data. Students will learn to use the SAS environment to write programs for reading and processing data and to perform basic data management tasks. This course will use Base SAS and SAS Enterprise Guide to provide access to SAS software, and course-related data. **(3)**

HOI 645 G *Epidemiology I (formerly PAD 693 G).* This course covers the principles and methods of epidemiologic investigation including describing the patterns of illness in populations and research designs for

investigating the etiology of disease. The course introduces quantitative measures to determine risk, association and procedures for standardization of rates. It also reviews application of basic principles and methods in the design and conduct of epidemiologic studies. Topics include the development of research questions; overview of epidemiologic study designs; sampling, sample size, and selection bias; techniques for data collection, sources of secondary data, and the evaluation of measurement and information bias; confounding and effect modification; techniques for simple and stratified analyses; and an introduction to mathematical modeling in epidemiology. **(3)**

HOI 646 G *Epidemiology II (formerly PAD 694 G).* Epidemiology is the study of the distribution and determinants of health-related states or events in specific populations and the application of this study to control health problems. These determinants are often seen in clinical practice and clinicians have a real opportunity to systematically evaluate various exposure-outcome relationships. The purpose of this course is to build on the foundations of epidemiology taught in Epidemiology 1. The emphasis of this course is application & variations on epidemiologic theory. The course is designed to develop critical thinking skills through the critique of journal articles, classroom discussion, lecture, and group exercises. Students will become aware of how to efficiently design and interpret epidemiologic studies. The course exposes students to common variants of traditional study designs and how these variations affect the validity & precision of exposure-response relationships. Epidemiology 2 has a greater emphasis on confounding, selection and information biases and techniques to minimize these biases using contemporary research methods. Logistic regression and other multivariate analyses are among these methods and this course reviews the basic concepts necessary to interpret these types of analyses **(3); Prerequisite:** HOI 645 G

HOI 655 G *Health Economics (formerly PAD 610 G).* This course is designed to introduce students to the economics of health care, with an emphasis on individual (i.e. demand side) decisions. We will examine how to apply microeconomic tools to analyze health care issues. Topics to be covered include demand for health and health care, individual responses to incentives inherent in health insurance markets, labor market effects, and health capital and health behavior decisions. Additionally, methodological issues for policy evaluation including cost-effectiveness and cost benefit analysis and estimating policy effects will be examined. Discussions will cover theoretical foundations as well as empirical methods and findings. **(3)**

HOI 665 G *Health Informatics (formerly PAD 741 G).* Health Informatics will introduce students to an interrelated set of theories, issues, technologies and methods related to the desire to improve healthcare through information technology. Different perspectives on the topic will be presented, with a particular emphasis on human factors and organizational learning. Students will gain practical experience in developing small health-related web applications. This will assist them in understanding the practical difficulties involved in improving systems through technology. In addition to a set of core health informatics topics, students will be given a set of optional topics from which they will choose one to research in depth. **(3)**

HOI 690 G *Topics in Public Health (formerly PAD 691 G).* This course will provide students with a basic understanding of the public health component of the U.S. health care system. Students will be introduced to the historical development of public health (e.g., food and water safety, sanitation and disease monitoring). The current U.S. public health system – both at the state and federal levels – will then be discussed. Key measures of public health will be covered, with an emphasis on disease prevention and in areas where pharmacists contribute to public health goals (e.g., immunization programs). **(3)**

HOI 710 G *Introduction to R Computing.* This course is an introduction to the statistical computing environment R. In this course you will learn how to write programs in R in order to perform tasks that quantitative researchers must perform. You will learn the packages and functions that are used in statistical analysis as well as techniques for managing data and using graphs to visually describe data. **(3); Prerequisite:** MAT 610; HOI 610

HOI 720 G *Big Data Analytics.* Big data refers to the idea that analysts manage, analyze, visualize, and extract useful information from large, diverse, distributed, and heterogeneous data sets to accelerate the progress of discovery, innovation, and information. Data are generated at such a great speed today that there is such large amounts of data that the challenge is how to develop efficient and effective computational tools to analyze the data to gain insight and make predictions; the interdisciplinary approach to machine learning, data mining, statistics, management, and analysis. This class will provide an overview of advanced machine learning, data mining, and statistical techniques that arise in data analytic applications. You will learn and practice data analytic techniques. **(3); Prerequisite:** MAT 610; PAD 636, PAD 725

HOI 750 G *Capstone (formerly PAD 750 G).* The capstone project is an integrative activity with a variety of final products based on the degree program and type of project undertaken. It is an opportunity for a student to gain additional training in one or more areas of health outcomes and informatics. The scope of the projects will vary based on the industry placement or investigators involved and may include but not limited to the examination of the primary literature on the subject, organizing and modeling data, performing health outcomes and informatics analysis, and providing recommendations. The common elements for each project is the production of a high quality project (research project or exhaustive case studies), the requirement for oral presentation of the final project and review by the corporate and faculty supervisor. **(3)**; **Prerequisite:** Permission of Program Director

HOI 751 G *Industry Practicum (formerly PAD 751 G).* The industry practicum is part of a capstone experience for students in ACPHS's master's degree program in Health Outcomes and Informatics. The practicum offers an educational opportunity for students to work for corporate clients doing real-time work, under the guidance of faculty, to analyze problems, negotiate requirements and scope, and solution development. The experience integrates all of a student's previous coursework. The capstone project is an integrative activity with a variety of final products based on the type of project undertaken. It is an opportunity for a student to gain additional training in one or more areas of health outcomes and informatics. **(3); Prerequisite:** Permission of Program Director

HOI 761 G *Thesis (formerly PAD 733 G).* Students will pursue a thesis project in a health outcomes research area selected to appropriately match their chosen career goals. In conjunction with the thesis advisor, students will perform an in-depth literature search and develop a testable hypothesis. The student and mentor then will work together to define a series of experiments that can be conducted to test the hypothesis. The student will learn the necessary techniques, conduct the experiments and analyze the data under the guidance of the mentor. Thesis work is compiled in a dissertation and presented as part of the thesis defense. **(1-6); Prerequisite:** Permission of Program Director

HUM 101 *The Pre-Modern World.* The first semester in a required three-course sequence, is an interdisciplinary course that surveys major world intellectual and cultural traditions from pre-history to the onset of the Modern Era (circa 1700 C.E.). We will read widely in history, literature, philosophy, fine arts, politics and economics to develop an understanding of the interrelated forces that shaped the dominant cultures across the globe. The study of themes will be employed to engage with the topics of the course including faith and reason, nature and civilization, individual and community, identity and the other, gender, and technology. **(3)**

HUM 102 *The Modern World.* The second semester in a required three-course sequence, is an interdisciplinary course that builds upon and incorporates ideas and skills from Humanities 101 as it surveys major world intellectual and cultural traditions from the onset of the Modern World (circa 1600 C.E.) to the middle of the 20th century and the post-World War II world (circa 1950). Students read widely in history, literature, philosophy, fine arts, politics, and economics to develop an understanding of the interrelated forces that

shaped dominant cultures across the globe. The study of themes (faith and reason, nature and civilization, individual and community, identity and the other, gender, technology) helps students to engage with the topics of the course and develop critical thinking skills. **(3); Prerequisite**: HUM 101

HUM 140 *Travel in Literature and Images (formerly LAS 171).* In this course, students study travel literature and images beginning with Homer's The Odyssey and ending with contemporary accounts. Students also create their own travel reports to share with the class during the last few weeks of the semester. This course asks students to consider not only how the act of travel but also how representations of travel can help us to understand ourselves, others, and the world. **(3)**

HUM 145 *Challenged, Banned, Censored: Visual Art and Literature (formerly LAS 233).* This course investigates various works of art and literature that have been, for whatever reason, challenged and banned from the public eye. Censors claim they are preserving the values of society, but their opponents claim they violate an individual's right to intellectual freedom. Discussions on visual art treat the shocking first Impressionist shows as well as the Nazi exhibit of "Degenerate Art." Readings include originally challenged or banned works that are now crucial elements of our cultural literacy. **(3)**

HUM 155 *African-American Literature and Music (formerly LAS 257).* In this course, students study African-American literature and music to understand African-American experiences and culture in historical, national, and global contexts. We consider how African-American literature and music (e.g., spirituals, blues, jazz, soul, and rap) can help us to understand ourselves, others, and the world. **(3)**

HUM 160 *Fiction and Film (formerly LAS 334).* This course examines five novels critically in terms of the authors' lives and the society of the time, and then considers the films made from these novels. **(3)**

HUM 165 *Introduction to Greek Mythology through Literature and Film (formerly LAS 337)*. Greek and Greco-Roman mythology has continued into the modern era via such diverse avenues as poetry, theater, art, political theory, philosophy, and archaeology. Students in this course will examine not only the myths themselves and how mythology has endured for thousands of years but also what Greek and Greco-Roman myths illustrate about the broader human condition. In short, why do these myths endure, and does their survival reflect the broader nature of humanity? Students will argue mythology from the perspectives of gender, history, literature, philosophy, warfare, and anthropology. Last, they will study the various ways we see Classical mythology reflected in modern American and global societies. **(3)**

HUM 201 *The Contemporary World.* Building on the foundation established in HUM 101 & 102, this course presents a thematic approach to understanding contemporary issues and events. This course requires students to employ the themes of faith and reason, nature and civilization, individual and community, identity and the other, gender, and technology to engage with, understand, and evaluate the contemporary world. Topics and areas may include the following: The U.S. in a Global Context, The Middle East, The Digital Revolution, 21st Century Health Issues, The Use of Natural Resources, Nationalism, Religious Fundamentalism, Globalization, The Post-September 11th World, Contemporary Social Movements, as well as other timely topics and/or areas. **(3); Prerequisite:** HUM 102

HUM 220 *Medical Humanities*. This medical humanities survey course studies how the interdisciplinary engagement of the arts, social sciences, and medicine adds to medical education and practice. This course aims to stimulate and enhance students' critical inquiry skills and growth in empathy and compassionate care. Important issues in life, in health, and in our psychological, emotional, and existential experiences as human beings will be explored through multiple genres and perspectives, including literature, film, history, philosophy, religion, and ethics. Topics may include but are not limited to: the history of medicine, the doctor-

patient relationship, death and dying, doctor-writers, narratives of illness, illness in film, medicine and power, religion and bioethics, suffering and hope. **(3); Prerequisite**: 2nd year standing or permission of the instructor

HUM 245 *Human Rights in the Age of Genocide.* Designed for students who wish explore the concept of human rights in an era when genocide has become a common warring practice in various regions of the world, this course studies significant genocides of various ethnic and minority groups. The course will look at the universal declaration of human rights and the practices of human rights groups such as Amnesty International, Human Rights Watch and engage the various readings and films/documentaries of genocidal events, the precipitating events and the aftermath of those genocides. **(3); Prerequisite:** HUM 101

HUM 250 *Visual Art and Literature of the 20th Century. What is "modern?" (formerly LAS 234).* This course concentrates on the growing sense of modernity that began in European culture at the end of the 19th century, moved to the United States after World War II and now is creating the reaction of "post-modernism." Class discussion focuses on the rapidly shifting movements of modern art and parallel developments in literature. **(3); Prerequisite:** HUM 102

HUM 255 *Caribbean Literature and Music (formerly LAS 258).* In this course, students study Caribbean literature and music to understand Caribbean, and especially Afro-Caribbean, experiences and cultures in historical, national, and global contexts. This course also includes a unit on health and health care in the Caribbean. Overall, this course considers how Caribbean literature and music (e.g., calypso, reggae, dancehall, soca) can help us to understand ourselves, others, and the world. **(3); Prerequisite:** HUM 101

HUM 260 *African Literature, Film, and Music (formerly LAS 252).* In this course, students study African literature, film, and music to understand African experiences and cultures in historical, national, and global contexts. This course also includes a unit on health and health care in Africa. Overall, this course considers how African literature, film, and music can help us to understand ourselves and others with an emphasis on appreciating the impact of African cultures throughout the world. This course is taught in conjunction with ACPHS's annual Africana Film Series. **(3); Prerequisite:** HUM 101

HUM 265 *Changing Images of Asia (formerly LAS 254).* The basic assumption underlying this course is that popular novels and related films have had a dramatic, and often negative, impact on shaping our images of Asia, particularly Southeast Asia. This course will critically review and examine popular readings about Asia in general and Southeast Asia in particular and feature films based on the readings. **(3); Prerequisite:** HUM 101

HUM 270 *Japanese Language and Culture I (formerly LAS 240).* This course offers basic language instruction and an introduction to the history and culture of Japan. Students will learn about the rich cultural history of Japan as a whole and also see its progression from feudal to modern society. The course will critically review literary and popular readings and also feature films and documentaries based on the readings. **(3); Prerequisite:** COM 115

HUM 275 *Japanese Language and Culture II (formerly LAS 260).* In this second introductory course on Japanese, there is a greater emphasis on language with the goal of developing both conversational and reading skills at a solid basic level. With regard to written language, students will be expected to have already learned the hiragana and katakana syllabaries. This course will make extensive use of kana while beginning to learn kanji (Chinese characters). The conversational aspects of language will focus on expanding vocabulary, grammatical structure, and sentence complexity. The language component will require extensive practice by the student outside of class time. The cultural component of the course will involve modern day Japan (post World War II) and interplay between various media and the evolution of the Japanese language. **(3); Prerequisite:** HUM 270 or permission of the instructor

HUM 280 *Studies in Leadership (formerly LAS 341).* This course takes a biographical and theoretical approach in exploring the origins and nature of effective leadership. In particular, the course examines the lives of representative "leaders" in selected fields – including the military, business, education, the arts and health care – in order to identify the characteristics of effective leadership and to determine whether those characteristics are innate or learnable. **(3); Prerequisite:** HUM 102

HUM 285 *Culture and Customs of Senegal.* This course introduces students to the culture and customs of Senegal (West Africa) including the role of culture and customs in health and health care. Although this course can be taken without going to Africa, the course prepares students for a 3-week (June - July) study abroad in Senegal. Students who go to Senegal intern in one of the following areas: healthcare, art therapy, orphan care, women's rights, the environment, or teaching. Pairs of students reside with selected Senegalese families. Activities in the capital Dakar include attending lectures at the West African Research Center and day trips. During a 10-day guided tour of the country, we visit the Holy Sufi City of Touba, small villages, an artist colony, Saloum Delta National Park, and go on wildlife safaris. As determined by a student's program and in consultation with the course instructor and the student's program director, a student in an appropriate year of study can earn 3 credits for this course and then additional credit by fulfilling the course requirements of CLK 803 for IPPE in Patient Assessment credit, CLK 806 for IPPE in Public Health credit, or HHS 401 for Capstone Experience credit. **(3); Prerequisite:** HUM 101

HUM 386 *Culture, Customs, and Health of Belize.* Although this course can be taken without leaving Albany, this course prepares students for a 2-week study and medical mission in Belize (during the January following the fall semester). During the fall semester, students learn about Belize and give presentations on tropical diseases, developing-world health care, and health conditions specific to Belize. Students also prepare pamphlets and educational skits and practice the basic health-clinic skills they will use in January. In Belize, students immerse themselves in Belizean culture by living with families in San Ignacio (2 or more students per family), attending lectures and workshops, visiting Maya ruins, hiking, caving, and snorkeling the world's second longest barrier coral reef. In villages along Belize's border with Guatemala, students set up and run health clinics, participate in medical home visits, and educate grade-school students about health and hygiene. As determined by a student's program and in consultation with the course instructor and the student's program director, a student in an appropriate year of study can earn 3 credits for this course and then additional credit by fulfilling course requirements of CLK 803 for IPPE in Patient Assessment credit, or HHS 401 for Capstone Experience credit. **(3); Prerequisite:** COM 115, HUM 102

IPS 301 and IPS 302 *Integrated Problem Solving Workshops I and II.* In the Integrated Problem Solving Workshops students will be required to solve problems which incorporate information from the courses offered during that term as well as previously mastered material. The goal of these workshops is to assist students in mastering course material in an active learning environment and in a manner that develops problem solving skills. These workshops are designed to cross disciplinary boundaries so that students will need information from more than one class to solve the problem and to foster deeper understanding of the material by the student. Students will be expected to use critical thinking skills, effectively communicate through speaking and function effectively in small group sessions. The workshops will be led by near-peers under the direction of appropriate faculty members. **(1 each); Prerequisite:** Doctor of Pharmacy students only. *IPS 301 is identical to PSC331.*

IPS 311 *Workshop Leader Seminar.* IPS311 is designed to provide workshop leaders with the tools necessary to effectively lead students groups through prepared workshop problems in diverse subject areas. Topics of multiple intelligences and learning styles, learning theories, biases (race, gender, political and religious among others) and how they alter leaning will be discusses in addition to workshop specific content. **(1); Prerequisite:** Permission of the instructor

IPS 401 *Integrated Problem Solving Workshops III*. The Integrated Problem Solving Workshops will integrate information from the courses offered during that term (and build on previously mastered material) in a way that assists students to understand and apply course material through an active learning environment that supports the development of problem solving skills. In addition, these workshops are designed to cross disciplinary boundaries to foster deeper understanding of the material by the student. Students will be expected to employ critical thinking skills, effectively communicate and function efficiently in small group sessions. The workshops will be led by near-peers under the direction of a faculty course coordinator. IPS3 will build on the skills that were developed in IPS 1 – 2. The integrated problem solving workshops will integrate information from previously mastered courses with the courses offered during the Fall P2 semester in a way that assists students in mastering course material in an active learning environment and in a manner that helps to develop problem solving skills.. IPS III will begin to incorporate pharmacology and therapeutic topic areas into a clinically oriented discussion, evidence-based decision making and SOAP note preparation.IPS3 will introduce students to a more therapeutically focused case-based approach to learning. Faculty teaching in the concurrently taught courses will author clinical cases that will be used in IPS3. **(1); Prerequisite:** IPS 301, IPS 302

IPS 402 *Integrated Problem Solving Workshops IV*. The Integrated Problem Solving Workshops will integrate information from the courses offered during that term (as well as previously mastered material) in a way that assists students in mastering course material in an active learning environment and in a manner that helps to develop problem solving skills. In addition, these workshops are designed to cross disciplinary boundaries to foster deeper understanding of the material by the student. Students will be expected to employ critical thinking skills, effectively communicate through speaking and function effectively in small group sessions. The workshops will be led by near-peers under the direction of a faculty course coordinator. IPS4 will build upon the skills and tactics taught in IPS workshops 1 through 3. More specifically, this workshop will start to build more clinically oriented decision making and SOAP note documentation. For IPS4, students will take a more clinically oriented case-based approach to learning. Faculty teaching in the concurrently taught courses will author clinical cases that will be used in IPS4. Students will continue to advance the skills learned in IPS 1-3 with respect to evidence-based approaches to clinical cases, writing more complete and sophisticated SOAP notes, and engaging in critical thinking and problem-solving with respect to clincial scenarios which are developed using material taught in the previous and concurrent semester of Spring P2. **(1); Prerequisite:** IPS 301, IPS 302, IPS 401

IPS 501 *Integrated Problem-Solving Workshop V.* The Integrated Problem Solving Workshops will integrate information from the courses offered during that term (as well as previously mastered material) in a way that assists students in mastering course material in an active learning environment and in a manner that helps to develop problem solving skills. In addition, these workshops are designed to cross disciplinary boundaries to foster deeper understanding of the material by the student. Students will be expected to employ critical thinking skills, effectively communicate with peers and facilitators and function effectively in small group sessions. The workshops will be led by near-peer leaders or faculty members. IPS V will build upon the problem solving and patient-centered care skills introduced and reinforced in IPS workshops 1 through 4. IPS V assists students in mastering course material in an active learning environment and in a manner that helps to further develop and refine problem-solving skills. Building upon the problem-solving abilities and patient-centered care skills introduced and reinforced in previous IPS workshops, IPS V engages students in discussion of patient-oriented care that requires integration of course material and practice foundations from the previous semesters of the professional curriculum. IPS V is distinguished from previous IPS workshops by offering increasing complex patient case examples for students to be able to practice written and verbal professional communication that utilizes sound therapeutic thought processes and drug information retrieval skills for identifying and resolving medication-related problems in various patient care settings. Emphasis will be placed on the student ability to employ and articulate rational clinical decisions or recommendations that are

evidence-based, including a formal written patient assessment and care plan in a formal Subjective, Objective, Assessment, and Plan written "SOAP" note. **(1); Prerequisites:** IPS 301, IPS 302, IPS 401, IPS 402

IPS 502 *Integrated Problem-Solving Workshop VI.* The Integrated Problem Solving Workshops will integrate information from the courses offered during that term as well as previously mastered material in a way that assists students in mastering course material in an active learning environment and in a manner that helps to develop problem solving skills. In addition, these workshops are designed to cross disciplinary boundaries to foster deeper understanding of the material by the student. Students will be expected to employ critical thinking skills, effectively communicate with peers and facilitators and function effectively in small group sessions. The workshops will be led by faculty members. IPS-6 will build upon the problem solving and patient-centered care skills introduced and reinforced in IPS workshops 1 through 5. IPS-6 is the sixth and final workshop of the Integrated Problem Solving series. IPS-6 is a continuation of previous workshops in that it will be a small-group, facilitator-led discussion centered around patient care that integrates materials taught previously or concurrently in the required PharmD curriculum. IPS-6, however, is distinguished from previous workshops in that the complexity of patient cases will be enhanced and will require students to present at least one evidence-based professional presentation (seminar component). Cases for IPS-6 will be authored by Pharmacy Practice faculty and include challenging multidisciplinary patient scenarios, therapeutic controversies and actual and potential drug-related problems for students to evaluate. Students will be required to critically evaluate literature to synthesize appropriate evidence-based recommendations that will be presented in small group discussions as well as in individual formal seminar case presentations. The practice of Medication Therapy Management will be reinforced in IPS-6. **(3); Prerequisites:** IPS 301, IPS 302, IPS 401, IPS 402, IPS 501

LIT 130 *Creative Writing (formerly LAS 133).* In this course, students read and write fiction, non-fiction and poetry. In a writing workshop setting, students also read and respond to each other's work. **(3)**

LIT 135 *The Short Story (formerly LAS 212).* In this course, students read, discuss and interpret the short story as it occurs in one or more periods or places. **(3)**

LIT 140 *Utopian Literature (formerly LAS 216).* Humans "dream of things that never were and say, 'Why not?'" From descriptions of the Golden Age and Eden to the latest feminist science fiction, students analyze our changing ideas of the possibility of achieving and sustaining a perfect human society. **(3)**

LIT 145 *Crime and Punishment (formerly LAS 236).* In this class, students read fiction, non-fiction and poetry and view films that deal with the issues of crime and punishment in society. Students write essays and journals responding to the texts and films, and investigate these issues in order to come to an understanding of the complexity of the issues and an awareness of their own stances on these questions. **(3)**

LIT 150 *Shakespeare (formerly LAS 237).* This course focuses on six or seven of Shakespeare's plays. Lectures provide biographical and historical background and class discussions concentrate on the texts themselves, considering structure, character development, imagery and theme. The class also considers the essential differences between comedies, tragedies, histories and romances and traces developing themes from one play to another as we move chronologically through selections of Shakespeare's work. Assignments include journal responses, formal analytical essays and a final panel discussion of a motif traced from play to play throughout the semester. **(3)**

LIT 155 *The Novel (formerly LAS 321).* In this course students read, discuss, and write about world novels. Selections may come from North America, South America, Europe, Africa, and/or Asia. Discussion topics will include themes that illuminate our understanding of the human condition, structural and symbolic devices used by the writers, and historical and biographical contexts. Some attention will be given to defining the novel

as a genre and tracing its development over time. Assignments include reading 4 – 6 novels, writing analyses of the novels, and presenting on a comparative thematic topic. **(3)**

LIT 160 *The Drama (formerly LAS 323).* In this course, students study a selection of dramatic works ranging from Classical Greece to the present. Students engage with recurring issues central to the human experience as part of considering how the communal experience of "the theater" can help us to understand ourselves, others, and the world. **(3)**

LIT 165 *American Women Writers (formerly LAS 336).* How many 19th and 20th century women writers can you name? This course will explore the works and contributions to American literature of some well-known and lesser-known women writers. We will consider several questions. Is there a tradition of American women writers? Do these writers have issues, concerns and themes in common? What are some of the historical and cultural forces that have shaped these writers? Do they speak to our own lives – as men and women – at the start of the 21st century? Students will respond to texts in a variety of writing experiences (journals, essays, fiction and poetry), develop confidence and competence as readers and writers and gain an appreciation for, and enjoyment of, the texts and the writers. **(3)**

LIT 170 *Chaucer (formerly LAS 331).* This course introduces students primarily to Geoffrey Chaucer's "Canterbury Tales" and peripherally to the author's life and times. Through a close reading of selected tales, reactionary and analytical writing and individual and group oral presentations, students immerse themselves in Chaucer's stories of a group of pilgrims setting off from London on a pilgrimage to the sHOIne of St. Thomas Becket, buried in Canterbury. The tales at once reveal the social structure and historical milieu of medieval England, thus broadening student understanding of the medieval world view and, by implication, our own, and prompt discussion about life choices, philosophies and attitudes. Simultaneously, students gain further experience in critical reading, thinking, writing and speaking. **(3)**

LIT 180 *Native American Mythology (formerly LAS 246).* In this course, students study various elements of mythology from diverse Native American cultures of northern and central America. Particular themes relevant to native cultures are examined and then placed in the context of what they mean to native world views and world mythologies. Some of the major themes include creation myths, concepts of illness and death and cyclical time. Some of the major figures examined include Grandmother Spider, Changing Woman, Sedna and Coyote. **(3)**

LIT 210 *English Novel (formerly LAS 117).* This course will provide a close critical reading of selected English novels, including the works of E.M. Forster, Aldous Huxley and Thomas Hardy. **(3); Prerequisite:** HUM 102

LIT 215 *American Literature (formerly LAS 147*). This course considers the contributions of 20th and 21st century American literature, with an emphasis on character, structural and thematic analysis against archetypal patterns of lost innocence, the journey home and resurrection. The class will search for a tentative definition of the contemporary American hero from a diverse selection of authors. In written and oral assignments designed to develop their own responses to the literature, students will search for touchstones for their own lives and the lives they read about. **(3); Prerequisite:** HUM 102

LIT 220 *Suicide and/as Literature: East-West (formerly LAS 161).* The phenomenon of suicide, familiar as an object of sociological inquiry and clinical therapeutic concern, also has been a prevalent narrative component of literary traditions throughout the world. This course will investigate suicide as a comparative conceptual device in a range of literary traditions extending from Europe to Africa, the United States, Japan and India. **(3); Prerequisite:** HUM 102

LIT 225 *World Masterpieces I (formerly LAS 253).* This is the first of two courses offered to enhance the understanding of narratives that cover milestones in literature and culture from around the world. The canonical texts from various countries/regions will focus on the multiple origins and histories of the cultures and polities being considered. Selections range from the ancient (World Masterpieces I) to the modern (World Masterpieces II). **(3); Prerequisite:** HUM 101

LIT 310 *Middle Eastern Literature and Film.* In this course, students study Middle Eastern literature and film to understand Middle Eastern, and especially Muslim, experiences and culture in historical, national, and global contexts. We consider how Middle Eastern literature and film can help us to understand ourselves, others and the world. **(3); Prerequisite:** HUM 201

LIT 315 *Irish Literature Since 1900 (formerly LAS 413).* This course considers the literature that emerged from 20th -century Ireland, literature formed both by the search for a national identity and by universal forces that transcend both time and place. Through reading and discussion of a selection of Irish fiction, drama and/or poetry, we gauge the power of the word to entertain, to communicate, to self-preserve and even to wage war. Assignments include journal responses, analytic essays and a final panel discussion of a motif traced throughout the readings during the semester. **(3); Prerequisite:** HUM 201

LIT 320 *The Epic (formerly LAS 311).* The Epic is a course that focuses on defining and understanding the most ancient written genre of western culture. Students will examine epics from the ancient world to the present and come to an understanding of why the poem being studied is an epic, how this particular epic defines, and in some cases redefines, the genre, and what the universal themes of the piece say about the human condition. Possible epics for analysis include The Iliad and The Odyssey by Homer, The Aeneid by Virgil, The Divine Comedy by Dante, and Paradise Lost and Paradise Regained by Milton. Texts will change each time the course is offered. Some semesters will include the study of an epic and later re-workings of the story in literary history to see how different eras translate old forms and stories for their own times. Assignments will include formal and informal writing, and group and individual oral presentations. The small class size will allow for regular informal discussion. **(3); Prerequisites:** COM 115, HUM 201

LIT 350 *Special Topic in Shakespeare.* In this upper division course, students will read a selection of plays by William Shakespeare, the list for which will vary from semester to semester. What will be constant is an examination of structural theories of comedies and/or tragedies, drama as a genre, and thorough literary analyses of the works of Shakespeare through close readings of selected plays and class discussions. The historical and biographical contexts of Shakespeare will be given some consideration. Students should expect to write formal essays and informal responses, and deliver oral presentations about the readings and actively participate in class discussions. **(3); Prerequisites:** HUM 101, HUM 102, HUM 201, and COM 115.

LIT 355 *Special Topics in the Novel*. In this upper division course, students will read a selection of novels, the list for which will vary from semester to semester. What will be constant is an examination of the novel as a genre and thorough literary analyses of the works through close reading of selected world novels and class discussions. The historical and biographical contexts of the novels will be given some consideration. Students should expect to write formal essays and informal responses, and deliver oral presentations about the readings and actively participate in class discussions. The course may be offered in the traditional 3 hours of class meetings a week or as a hybrid course in which the students meet 1 to 2 hours a week and complete work independently on line. Because the course is a 300 level course, students are required to have completed the Humanities sequence and Principles of Communication or the equivalent thereof. **(3); Prerequisites**: HUM 201, COM 115

LIT 390 *Independent Study in Literature.* This course provides an opportunity for students to participate in a specialized study of a particular facet of literature. Examples may include a genre of literature, time period, or

an author's body of work. The student under faculty advisement must submit a proposal to the Department Chair for approval. **(1-3); Prerequisite:** Permission of the instructor

MAT 111 *Calculus.* This course is a study of algebraic and transcendental relations, with emphasis on applications in the physical sciences. Limits, differentiation, applications of derivatives, related rates, implicit differentiation, integration by substitution and applications of integration will be the main topics covered. **(4)**

MAT 115 *Introduction to Laboratory Data.* This course introduces the mathematics needed to collect and describe data from laboratory sciences. The course covers assessment and evaluation of measurement and experimental error and descriptive statistics. It also covers evaluating, solving and graphing relationships that are linear, exponential and logarithmic. Linear regression is used to fit data for zero (linear) and first (exponential) order processes. **(2);** *Lecture and Laboratory*

MAT 121 *Calculus I.* This course is a study of algebraic and transcendental relations, with emphasis on applications in the physical sciences. Limits, differentiation, applications of derivatives, area under the curve, Fundamental Theorem of Calculus, methods of integration, and applications of integration will be the main topics covered. **(4)**

MAT 145 *Elementary Statistics.* This course covers general statistical methods used in the collection, presentation, analysis and interpretation of statistical data. It includes measures of tendency, dispersion, probability theory, probability distributions, central limit theorems, hypothesis testing on proportions and means, ANOVA, regression analysis and correlation. This course will require statistical applications using computer software. Applications in biology, chemistry, health care and pharmaceutical science will be explored. **(3)**

MAT 155 *Statistics.* This course covers general statistical methods used in the collection, presentation, analysis and interpretation of statistical data. It includes measures of tendency, dispersion, probability theory, probability distributions, central limit theorems, hypothesis testing on proportions and means, ANOVA, regression analysis and correlation. This course will require statistical applications using computer software. Applications in biology, chemistry, health care and pharmaceutical science will be explored. *This course is open only to students in the College's BS programs*. **(3)**

MAT 211 *Calculus II.* This course is a continuation of Calculus I, and is primarily focused on expanding the repertoire of integration techniques to include: powers of trigonometric functions, powers of hyperbolic functions, trigonometric substitutions, rational functions, power series expansions, and improper integrals. In developing these methods, additional calculus concepts are examined, such as: implicit and logarithmic differentiation, L'Hopital's rule, partial fraction decomposition, sequences, series, and Taylor series. **(4); Prerequisite:** MAT 121

MAT 235 *Differential Equations.* This is a one-term treatment of ordinary differential equations with applications. Topics include classification of, and what is meant by the solution of a differential equation, first-order equations for which explicit solutions are obtainable, explicit methods of solving higher-order linear differential equations, and an introduction to systems of differential equations. Applications of first-order linear differential equations and second-order linear differential equations with constant coefficients will be studied. Applications in the mechanics of motion, population models, chemical reactions and other models will be used to motivate the particular differential equations to be solved. Technology will be an integral part of this class. **(3); Prerequisite:** MAT 211

MAT 290 *Independent Study/Research.* This course provides an opportunity for students to participate in (1) a hands-on research experience or (2) a specialized study project under the guidance of a faculty member. The

number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. MAT 290 is generally reserved for introductory level experiences and/or smaller scale projects. Students are expected to perform three hours of research or project related work per credit hour earned. **(1-3); Prerequisite:** permission of the instructor

MAT 380 *Topics in Mathematics or Computation*. Topics in Mathematics or Computation typically cover a specific topic in an area of pure mathematics, applied mathematics, statistics, or computation and are intended to enhance and expand the selection of offerings from semester to semester and offer specialized courses in emerging fields. The number of credit hours and scope of the course are at the discretion of the faculty member involved and requires approval by the department chair. Repeatable for credit. **(1-3); Prerequisites**: MAT111 or MAT121, and/or MAT145 or MAT155, and/or additional prerequisites required by the instructor based on the specific topics course being offered.

MAT 411 *Randomized Controlled Trial Methods via CONSORT.* The Consolidated Standards of Reporting Trials (CONSORT) encompasses various initiatives developed to alleviate the problems arising from inadequate reporting of randomized controlled trials (RCTs). The main product of CONSORT is an evidence-based, minimum set of recommendations for reporting RCTs. The course, which will outline and detail many of the CONSORT guidelines regarding methods and results, will benefit those wishing to develop a better understanding of the statistical methods commonly found in the RCT literature as well as discerning important analytical components of pharmaceutical research. Topics will include discussions of sample size, power, outcomes, summary of results and statistical methods. **(1); Prerequisites:** PHD 410, MAT 145 or permission of the instructor

MAT 490 *Independent Study/Research.* This course provides an opportunity for students to participate in (1) a hands-on research experience or (2) a specialized study project under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. MAT 490 is generally reserved for more advanced research projects of students with prior research experience. Students are expected to perform three hours of research related work per credit hour earned. Faculty members may expect students to present their research in venues either internal or external to the college. Students are expected to perform three hours of research or project related work per credit hour earned. **(1-3); Prerequisite:** permission of the instructor

MAT 610 G *Statistical Inference and Modeling*. This course provides students with a basic knowledge of biostatistics. It includes methods of experimental design and data analysis used to make inference. Topics covered include confidence intervals, hypothesis testing, multivariable regression, generalized linear models, survival models and analysis of variance. The course will also include a component which introduces the students to statistical programming. **(3)**

MUS 110 *The World's Music (formerly LAS 247).* This course explores world cultures through their music. The course begins with an overview of some different ways of listening to music and exploring sound as a cultural phenomenon. A primary goal of this course is to help students move beyond some preconceived notions of music in order to open minds and ears to a wide variety of music through a selection of case studies, including, but not limited to, Africa, Asia, Latin America and ethnic immigrant cultural communities in North America. The music of these cultures is explored both as a product and reflection of culture and as a form of artistic expression. **(3)**

MUS 120 *American Roots Music.* This course explores the musical forms, genres and instruments that uniquely evolved on American soil and serve as the basis of American popular music today. More than just a reflection of the diversity of the American experience, students will make connections to important social, political, historical and literary movements of the 19th and 20th centuries. **(3)**

PAD 330 *ACPE Accreditation: A Student's Perspective.* The Accreditation Council for Pharmacy Education (ACPE) is the official body that evaluates pharmacy schools and gives them the authority to offer a PharmD degree. In this course, students will learn about the ACPE accreditation process and the standards that all pharmacy schools must meet. Select ACPE standards will be chosen for further evaluation. Students will be given access to real data in order to evaluate how ACPHS meets the standard. The course will culminate with a final project where students will work in groups to create a presentation for the College Community. Evaluations and recommendations will be shared with the Dean of the pharmacy school, the Student Government Association and other administrators and departments where appropriate in order to support a culture of assessment and facilitate continuous improvement. **(3)**

PAD 351 *Introduction to Sales and Marketing in the Pharmaceutical Industry.* This course will provide students with a basic understanding of the pharmaceutical industry, with an emphasis on pharmaceutical sales and marketing. Attention also will be given to areas such as manufacturing, government regulations and research, and their relevance to pharmaceutical sales and marketing. The student will have an understanding of how these areas relate to pharmaceutical industry customers such as hospitals, practitioners, managed care organizations, employers, insurance companies, long-term care and consumers/patients. Emphasis will be placed on the student's ability to understand the pharmaceutical industry and its customers, and to apply this knowledge in sales and marketing situations. **(3); Prerequisites:** ECN 217 and PSY 201

PAD 368 *Qualitative Research Methods.* The goal of this course is to give students an opportunity to learn how to design, implement and interpret results from qualitative research. Applications of qualitative research will be discussed, providing students with firsthand knowledge of practices in market research and community needs assessment. The methods learned in this course also will be applied to a student-selected group research project, culminating in a presentation. **(3)**

PAD 372 *Health Insurance for Pharmacists.* This course will cover the fundamentals of public and private health insurance law, regulations, and operations in the United States. The overall focus will be on policy challenges relevant to pharmacists, health care managers, policy makers, providers and consumers. It will address policy issues affecting structure, performance, and change in the health care system including: roles and responsibilities of Federal and State agencies and associations; roles of Federal and State legislatures and courts; and roles of providers and advocates. The course will also provide students with a detailed introduction of the following: typical questions that a pharmacist may be asked by customers; health insurance operations and how to help customers with their insurance options at the pharmacy counter; how multiple public and private insurances coordinate payment and basics related to insurance billing; as well as issues related to point–of-sale claims processing for pharmacy services. The course will be comprised of class room instruction and discussion, individual research study projects, and a group research project concerning recent changes to health insurance law, regulations, and operations in Vermont and nationally. **(3)**

PAD 393 *Introduction to Epidemiology.* The purpose of this course is to equip undergraduate and graduate students with the concepts and principles of epidemiology, the basic scientific discipline of public health. As defined in A Dictionary of Epidemiology, Third Edition (Oxford, 1995), epidemiology is the "study of the distribution and determinants of health-related states or events in specific populations, and the application of this study to the control of health problems." Many people would say "disease" in place of "health-related events," but the more general definition makes the point that the methods of epidemiology are applicable to behaviors (e.g., why people smoke, why they use seat belts) and events such as injuries (e.g. hip fractures in the elderly), as well as diseases (e.g., lung cancer, hepatitis B infection). The purpose of this course is to provide the basic framework for how to systematically evaluate an exposure-disease relationship using epidemiologic principles. The course also provides a framework for the basic measures and statistics used in the analysis and interpretation of epidemiologic studies. **(3)**

PAD 394 *Epidemiology II.* Epidemiology is the study of the distribution and determinants of health-related states or events in specific populations and the application of this study to control health problems. These determinants are often seen in clinical practice and clinicians have a real opportunity to systematically evaluate various exposure-outcome relationships. The purpose of this course is to build on the foundations of epidemiology taught in Epidemiology 1. The emphasis of this course is application & variations on epidemiologic theory. The course is to designed to develop critical thinking skills through the critique of journal articles, classroom discussion, lecture, and group exercises. Students will become aware of how to efficiently design and interpret epidemiologic studies. The course exposes students to common variants of traditional study designs and how these variations affect the validity & precision of exposure-response relationships. Epidemiology 2 has a greater emphasis on confouding, selection and information biases and techniques to minimize these biases using contemporary research methods. Logistic regression and other multivariate analyses are among these methods and this course reviews the basic concepts necessary to interpret these types of analyses. **(3)**

PAD 433 *Profiles in Leadership.* This elective is designed to introduce how leaders inspire and mobilize others to want to make extraordinary things happen in organizations and endeavors. Five key leadership practices from the text will be presented, along with case studies in which these leadership practices are exemplified by remarkable leaders and characters in recent movies. This course is designed to acquaint students with these leadership practices and related commitments to leadership through the use of film and other media. Students will analyze assigned and self-selected case studies to determine how these leadership principles are applied. Students will also develop a personal code of leadership which they can use in their personal and professional lives. **(3)**; **Prerequisite:** Doctor of Pharmacy in years P1-P3; BS students in the third and fourth years

PAD 451 *US and Global Healthcare Systems.* This course presents a systematic comparative analysis of the evolution, administrative structure, finance, and provision of medical care in selected countries throughout the world. Equity/inequity and the current and looming effects of globalization will be explored. Health and illness are familiar concepts to all of us, but we are used to thinking of them as biological phenomena. This course will expand your understanding of health and illness by looking at them as socio-cultural and socio-economic phenomena. Important differences rooted in culture, ethnicity, social, economic and political factors will be examined to encourage innovative "framing" of U.S. health public policies. This course presents and facilitates the development of an analysis of major health service delivery and management issues from an international perspective. Each country in the world possesses and implements a unique health service delivery system. While there may be many factors, components and issues in common, there are nonetheless many differences. It is important to learn about and analyze other country's healthcare systems, to learn how they treat similar issues and to discover innovations. Improvement often comes through change and innovations, and this study will not neglect the opportunity to learn from others, especially those middle and lower income countries implementing interesting and innovative reforms.By utilizing a comparable model of exploration, we will gain an understanding of the similarities and differences of industrial countries, third world countries and tribal programs in the US. **(3)**

PAD 505 *Quality Improvement in Health Care.* The purpose of this course is to familiarize the student with the concept and the process of Quality Improvement across the Health Care System. Topics to be discussed in this course include the history of quality, leaders and trends in quality and patient safety, measurement and analysis of variation in different environments, and the guidelines for implementing quality management and the continuous quality improvement processes. Additionally, the students will apply knowledge gained by examining the changes that some US Health Care Systems have made and the impact that those changes have had on improving the quality of Health Care to Americans. **(3)**

PAD 510 *Pharmacy Jurisprudence – Vermont*
Jurisprudence Vermont introduces and reinforces knowledge of the federal and Vermont statutes and administrative rules related to the practice of pharmacy in the state of Vermont. While specific to the state of Vermont, this course can be considered by students intending to seek licensure in states other than Vermont. Students considering licensure in New York are advised to register for PAD511 Pharmacy Jurisprudence-New York. PAD510 is delivered entirely as an online course with scheduled weekly lessons for the student to complete on their own. **(3)**

PAD 511 *Jurisprudence – New York.* This course provides an overview of the history of drug law in the United States with an emphasis on New York state law. The current federal and New York state laws are reviewed in depth with a focus on preparing students to pass the MPJE exam® and to practice pharmacy in the state of New York. **(3)**

PAD 515 *Pharmacoeconomics and Health Policy.* This is the second course in the sequence of Administration-Management-Economics component of the PharmD curriculum. This course will provide students with an introduction to the principles and techniques of pharmacoeconomics and health outcomes evaluation, and to the methodologies used by decisionmakers and stakeholders to draft and implement health policy. It builds on the economic principles presented in health economics (US and Global Health Care Systems) to describe the major components of the current U.S. healthcare system. Building on that foundation, the course introduces the techniques used for evaluation of health care interventions. These methods provide the basis for measuring and assessing the economic and non-economic consequences of healthcare interventions, emphasizing drug therapy, and pharmaceutical services. Examples of some of the economic methods introduced include:cost of illness analysis, cost-minimization, cost-effectiveness analysis, cost-benefit analysis, and decision analysis. Non-economic measures discussed include general and disease specific quality-of-life (QOL) assessments and health status measurement. Students will demonstrate the ability to critique published studies which use pharmacoeconomic or health outcomes techniques, assessing the quality of the research and drawing relevant conclusions. **(3); Prerequisite:** PAD 415

PAD 521 *Pharmacy Administration*. Effective administration in pharmacy is contingent upon an appreciation for and understanding of the pharmacy and all of its stakeholders. This course has been designed to focus on the administrative aspects of the practice of pharmacy. Some of the topics covered include strategic and business planning, operations management including the topics of medication safety and quality management, third party programs, inventory management, patient advocacy and human resources management, as well as leadership and management. The overall purpose of the course is to prepare students to be knowledgeable about and sensitive to the issues concerning pharmacy from the perspectives of all stakeholders (e.g., providers, manufacturers, employees) and to develop the leadership skills necessary for success in practice. (3); Prerequisites: PAD 415, PSC 441

PBH 210 *Introduction to Data.* Data is vital to modern health care systems and growing in complexity. Gathering data and organizing it to answer important questions in clinical practice and public health and safety are essential skills for those working in health and health care. Learning to access patient, clinical data and the wide range of data sources (e.g., administrative data, patient reported data, and secondary data) and the common mechanisms to represent clinical data (e.g., ICD). Strategies for optimizing data quality and questions around the ethics, privacy and ownership will also be discussed. The future of technology and its influence on health care data and acquisition will be explored. Beginning to understand existing tools for data analytics. **(3)** **Corequisite:** PBH 211

PBH220 *Environmental Health*. This course is designed to provide students with an introduction to and overview of the key areas of environmental health. Using the perspective of the population and community, the course will cover factors associated with the development of environmental health problems. Students will

gain an understanding of the interaction of individuals, communities, and economic activity with the environment, the potential impact on health of environmental agents, and specific applications of concepts of environmental health. The course will cover principles derived from core environmental health. The sequence of major topics begins with background material and the tools of the trade (environmental epidemiology, environmental toxicology, environmental policy and regulation). The course then covers specific agents of environmental diseases (e.g., microbial agents, ionizing and non-ionizing radiation). Finally, applications and domains of environmental health are addressed (e.g., water and air quality, food safety, waste disposal, occupational health, and injuries). **(3)**

PBH320 *Geography of Health*. The Upper East Side. Rural America. Spanish Harlem. The Stroke Belt. Appalachia. China Town. Sunny California. These evocative place names conjure images of wealth and poverty; isolation and community; health and disease. This course explores how and why place matters for health; how we explore the spatial patterns of health and disease; and how the assessment, assurance, and policy actions of public health can address disparities associated with where people grow-up and live their lives. Students will read about the geography of health from bestselling memoirs, essays and journalism, research findings, and textbooks. They will see and hear about the effects of place from movies and documentaries. They will experience how scientists explore health using spatial analysis and geographic information systems (GIS). And they will encounter public health in action by exploring and documenting the interplay between health and place in the neighborhoods of Albany and its surroundings. **(3) Prerequisite**: SOC 120 or equivalent

PBH 330 *Global Perspectives in Epidemiology*. Global health is of critical importance with the emergence of new diseases such as SARS and H1N1, the potential threat of biological agents such as anthrax, the continued prevalence of diseases such as malaria and dengue, the co-evolution of HIV and multiple drug resistant tuberculosis, the return of once-vanquished diseases like polio, and the export of chronic diseases from industrialized countries to the rest of the world. This course provides an overview of global perspectives in epidemiologic investigations. Students will explore key epidemiologic principles to address these issues and suggest interventions to improve poor health and reduce disease and disability worldwide and provides an overview of global public health concepts as they related to the field of epidemiology. **(3); Prerequisites**: SOC 301, SOC 120, PAD 393

PBH 340 *Survey Research Methods.* This course is intended to familiarize students with the theory and application of survey research methods in data collection. For researchers in social and behavioral sciences and applied professional fields including public health, social surveys are an essential tool. Course material will examine the decisions made by a health researcher in designing and implementing a survey. Coursework will include the hands-on development of each part of the survey process including the creation of a survey instrument and associated research plan for implementation and analysis. Students will also learn about existing survey data and sources that could be relevant for health researchers and will work to analyze and present results from such existing data to answer relevant health questions. **(3); Prerequisite:** SOC 301

PBH 345 *Concepts in Community Health Practice*. This course provides an integrated application based approach to public health concepts and practice by examining the philosophy, purpose, history, organization, functions, tools, activities and results of public health practice at the national, state, and community levels. The course also examines public health occupations and careers. Case studies and a variety of practice-related exercises will serve as a basis for student participation in real world public health problem-solving simulations. The various components of the course aim to stimulate interactions among student and instructors around important problems and issues facing public health. **(3); Prerequisites**: SOC 120, SOC 101

PBH 360 *Field Epidemiology*. This course is designed to provide an overview of the methods used in epidemiologic field investigations. It provides students with a comprehensive review of the basic components of an outbreak investigation, an introduction to public health surveillance, and an overview of specific types of

investigations in which a field epidemiologist might become involved, including traceback studies, environmental health assessments, noninfectious health event investigations, contact tracing, and forensic epidemiology. In addition, resources that often come into play in outbreak investigations are presented, such as public health laboratories, the incident command system, and geographic information systems. **(3); Prerequisite**: SOC 301

PHD 410 *Drug Information and Biostatistics.* This course addresses drug information retrieval, analysis and application. It will instruct students how to obtain and evaluate primary and secondary literature as it relates to the provision of pharmacy/pharmaceutical care. Through the lecture series, students will acquire knowledge of library resources, study design, biostatistics using relevant examples and a method of drug literature evaluation. Two written assignments will provide students an opportunity to apply knowledge learned during lecture and develop literature retrieval and evaluation skills using examples from primary and secondary literature. Students will also be introduced to general drug information topics including; the approach to answering drug information questions, adverse drug event reporting, medication use evaluation and evidence based medicine. Knowledge and skills developed in this course will prepare students for subsequent IPS workshops, seminar and pharmacotherapy course offerings. **(2); Prerequisite:** MAT 145, MAT 227

PHD 451 *Pharmacist-Assisted Tobacco Cessation.* This clinical elective provides students with the necessary knowledge and skills to provide comprehensive tobacco cessation counseling to patients who are current or former tobacco users. The course approaches the concept of nicotine addiction from a pharmacologic, physiologic and psychological perspective. Communication and problem-solving skills are developed in the classroom and enhanced via participation in a tobacco cessation clinic. Upon completion of the course, students will demonstrate competency in tobacco cessation encounters, including assessing a person's readiness to quit, applying tailored strategies to assist patients with quitting and selecting appropriate tobacco cessation aids. **(1)**

PHD 556 *Updates in Pharmacotherapy.* In preparation for APPE, board exams, and practice, this course aims to provide P3 students with opportunities to assess the role of newer drugs therapies in the management of various disease states already taught in the PTPM curriculum. Students will participate in weekly learning activities after attending pharmacist-led lectures and case-based discussions that evaluate newer vs. established drugs therapies. Students will practice identifying and evaluating literature/drug information resources to make evidence-based recommendations. The course will be taught by ACPHS Faculty along with pharmacists who are currently participating in the ACPHS Teaching/Learning Program as part of residency training. (3); Prerequisites: P1, P2 and P3 Fall Semester

PHI 115 *Religions of Asia.* This course provides a survey of the major religious traditions of Asia, including Hinduism, Buddhism, Taoism, Confucianism, and Islam. The course emphasizes how each tradition shapes the aims, views, and experiences of the people who participate in them. With each religion we will investigate the following: What are the central texts and practices of each tradition? What are the most important questions that these traditions ask? How have these faiths evolved to the present day? How has each tradition been changed by its encounter with modernity and how has each religion in turn influenced modernity? The course will conclude with a consideration of some of the ways the traditions of Asia have influenced contemporary spirituality and new religions, especially in the West. **(3)**

PHI 140 *Spiritual Healing (formerly LAS 250).* This course will look at several different examples of contemporary spiritual healing practices drawn from many of the religions and spiritual movements from around the world. The primary objectives of the course are: a knowledge and appreciation for various examples of spiritual healing practices and the development of an analytical and tolerant assessment of the theoretical and practical differences and similarities between contemporary spiritual and scientific healing practices. **(3)**

PHI 145 *Logic and Reasoning*. This class focuses on inductive and deductive reasoning. We cover a wide range of topics in critical thinking, such as rational argumentation, fallacies, definition, meaning, truth, and evidence. We discuss how the techniques for critical reading and thinking that we develop in this course are applicable to your work in other classes and to your future careers. **(3)**

PHI 210 *Comparative Religion (formerly LAS 215).* This course will provide a survey of and an engagement with the contemplative or wisdom dimension of four traditions in world religions: CHOIstianity, Buddhism, Native American Religion, and Islam (Sufism). Rather than look at these traditions only from the outside, in a descriptive manner, we will read texts from authors within these traditions who attempt to explain and describe their understanding of the contemplative/meditative dimension of each tradition. From this perspective, fundamental questions will be examined and discussed such as: What is the spiritual psychology of a human being? What is the human heart and what role does it play in human knowing? How does one cultivate a spiritual presence? What is the relationship between the human and the divine? **(3); Prerequisite:** HUM 102

PHI 240 *Islam and Sufism (formerly LAS 238).* This course will provide an introduction to Islam and Sufism. The first section will serve as a basic introduction to the Islamic worldview, the Koran and the life of the Prophet Muhammad. The aim will be to arrive at an understanding of the experience of Islam, paying close attention to how Muslims have defined themselves using their own language. Next, we will look more closely at the Islamic sapiential tradition, Sufism and, in particular, the major authors who have defined and informed this important dimension of Islam in terms of both theology and ritual. **(3); Prerequisite**: HUM 101

PHI 245 *Introduction to Buddhism and Meditation (formerly LAS 249).* This course will provide an introduction to the world view and practice of Buddhism. This will include the study of key teachings of Buddhism, including the Four Noble Truths; the life of the Buddha; and example texts and teachings from a variety of Buddhist authors. We will also examine different schools/approaches to Buddhism, including Zen Buddhism and Tibetan Buddhism. Additionally, the course will include regular instruction in the practice of meditation and mindfulness techniques. **(3); Prerequisite:** HUM 101

PHI 247 *Mindfulness Based Stress Reduction.* Mindfulness Based Stress Reduction (MBSR) is a practice-focused course in meditation and mindfulness techniques that will allow students to manage and mitigate stress. Through an introduction to contemplative practices, as well as reading, discussion, and written reflection, the students will gain a sense of control over their health and well-being through a method proven to have physical and mental health benefits. **(1)**

PHI 250 *Religion as the Search for Meaning (formerly LAS 271).* Students examine the major religious traditions within the framework of an analysis of humankind's fundamental need to find meaning in the world by explaining and maintaining proper relationships among the self, society and nature. **(3); Prerequisite:** HUM 102

PHI 255 *Religion, Philosophy, and Film (formerly LAS 272).* This course will explore examples of contemporary cinema from a wide variety of genres and regions that reflect various dimensions of world religious and philosophical traditions. We will examine and discuss the images, metaphors, and ideas expressed in film as a means to explore and contemplate some of the following questions: What is the sense and purpose of human life? What are the ways that film presents and dramatizes religious or philosophical concepts? What role does religion play in human life or what meaning does it provide? Can film evoke or illuminate religious or spiritual experiences and philosophical insights? Can film be morally, philosophically, spiritually, or religiously educational? Everyone is asked to bring their own questions to bear upon the films and class discussions. Each

week we will watch a film in class and students will also be required to participate in ongoing conversations on a discussion board. **(3); Prerequisite:** HUM 101

PHI 280 *The Philosophy and Practice of Yoga.* It is believed that yoga (Sanskrit, "to yoke" or "to harness") goes back to the earliest roots of Indian history. This course will provide an introduction to the history, philosophy, and practice of yoga. We will study key texts in the tradition of yoga, such as Patanjali's Yoga Sutras, the Bhagavad-gita, contemporary writings on yoga, as well as research on the health effects of yoga. The course will include weekly practice of yoga, including work with physical postures (asanas), breathwork (pranayama), and meditation techniques. **(3); Prerequisite:** HUM 101

PHI 350 *Nature and Wellness*. This course looks at how human interactions with Nature can promote spiritual, psychological, and physical wellbeing. We will read historical and contemporary texts that explore human-Nature relationships focusing on contemplative approaches that emphasize spiritual, ecological, social, and ethical concerns. We will also look at human-Nature interactions in relation to health outcomes. Through critical reading, discussion, and reflective experiences in Nature, students will consider the importance of Nature to their individual lives, their communities, and to our ecologically and culturally interdependent world. This course will include an experiential component including one or more field trips. **(3); Prerequisite**: 3rd year standing or permission of the instructor

PHI 370 *Contemplative Studies.* This course will provide a survey of and an engagement with the contemplative, meditative, and ritual dimensions of world religious, spiritual, and philosophical traditions. Topics will vary, but may include contemplative practices from both Western and Eastern traditions, including CHOIstianity, Islam, Buddhism, Taoism, and Native traditions. We will read texts from authors within these traditions who explain and describe their understanding of contemplative practices – practices that have been historically at the center of these traditions. Through critical reading, discussion, and written reflection, students will be asked to consider the ethical and moral implications and outcomes of contemplative practices. This course will also include an experiential component through which students will be introduced to meditation, ritual, or other contemplative practices and may also include visits to local monasteries, groups, or gathering places of the traditions that we investigate. **(3); Prerequisites:** HUM 102, HUM 201, COM 115

PHI 380/PSC 380 *Brain, Mind and Meditation.* The Science and Practice of Mindfulness and Meditation: Meditation and other contemplative practices are increasingly used to reduce stress, improve health, and treat disease. This interdisciplinary course will discuss the neurobiological and psychological basis of these effects and explore the relationship between the brain and the mind as revealed through the theory and practice of meditation. The course will consist of three integrated components. The first component will consider the scientific evidence demonstrating that meditation produces lasting changes in brain anatomy and function and review accumulating research data showing that meditation produces therapeutic effects in chronic pain, depression, drug addiction, and other psychiatric and physiologic disorders. The second component will explore the theory and philosophy behind meditative practices and contemplative techniques drawing from Buddhist and other traditions, used, traditionally, by religious practitioners and, in contemporary society, to reduce stress and improve health and well-being. In the third component of the course, students will be introduced to meditation and other contemplative methods so they can explore, personally, the effects of meditation on the mind. The course will be taught by specialists in neuroscience, religious studies, and mindfulness-based meditation. **(3)**

PHM 318 *Foundations of Pharmacy.* This course provides dynamic introduction to the profession of pharmacy, formally introduces the concept of professionalism, and serves to initiate the professionalization of all students enrolled in the Doctor of Pharmacy degree program. Coursework is a combination of pre-class readings, live or online lectures with engagement activities, and post-class assignments designed to expose students to a comprehensive introduction to Pharmacy Practice and pharmacy career exploration. Students will write

summaries and reflections of topics covered over the course of the semester, engage in peer-peer interaction through online discussion boards, and participate in in-class gamification. An introduction to the Top 100 drugs is included in this course, as prerequisite preparation for upcoming practice experiences. This course is a prerequisite for the Introductory Pharmacy Practice Experiences (IPPEs).

PHM 324 *Pharmaceutical Industry and the Pharmacist's Role.* This course will provide an overview of the pharmaceutical industry covering topics of: research, development, medical, regulatory, marketing, sales, distribution, legal, ethics and compliance. Headquarters and field based perspectives will be shared. The course will provide the student with an overview of the various types of pharmacy careers available within the pharmaceutical industry in each of the listed topics . The course will be team taught by pharmaceutical industry experts. **(3); Prerequisite**: Current P1, P2 or P3 student

PHM 329 *Self Care/OTC***.** This course will guide the student through an interactive approach to self-care. An appreciation of the pharmacist's role in self-care will be taught with an emphasis on the Joint Commission of Pharmacy Practitioners (JCPP) Pharmacists' Patient Care Process and self-care therapy selection. Treatment options that will be discussed will range from non-drug therapy to non-prescription medications and devices to herbal products and dietary supplements. **(3); Prerequisite**: Current Doctor of Pharmacy student

PHM 350, 450, 550 *Applied Methods in Epidemiologic Research*. Students will develop problem-solving skills and enhance their knowledge of contemporary methods in clinical epidemiologic research through application. Students will participate in a number of activities that are both instructional and applied. Activities include introduction to basic topics in clinical epidemiologic research (measures of disease frequency/association, study design and handling bias), data collection, database management, data analysis, scientific writing and preparing abstracts/posters for presentation at conferences and manuscripts for publication in peer-reviewed medical journals. P1 and P2 students will participate in developing a research question/hypothesis, identifying appropriate study designs to test a hypothesis, protocol development and data collection. P2 students will continue the activities from the preceding year. P2 students will also create/manage an electronic database, compute basic measures of disease frequency, and perform quality checks on variables that could confound or bias the measure of association. P3 students will serve as project managers and assist in mentoring P1 and P2 students with data collection and database management. P3 students will also participate in data analysis and preparing an abstract/poster for presentation at a national meeting. The course does not have any underlying prerequisite coursework. However, interested students must contact the course coordinator expressing their intentions and undergo a brief interview. Selected students will be invited by faculty to participate in this course which can range from **1 to 6 credits**.

PHM 354 Pharmacy Leadership and Advocacy. Pharmacy as a profession is at a turning point. We are moving towards an emphasis on direct patient care activities and reimbursement for our cognitive services. For the profession to continue to move forward effective leaders are needed to provide mentorship to the newly emerging members of the profession and to advocate for the profession. This elective course is designed to familiarize students with effective leadership skills, the legislative process, and converging this knowledge to make the transition from leadership to advocacy. Students will be involved in interactive discussions, listen to guest lecturers such as key legislators and pharmacy leaders/advocates, and hold debates on current pharmacy practice issues. Becoming a successful advocate can open doors for pharmacists to use their extensive knowledge to ensure effective care is being provided to their patients**.(3); Prerequisites**: Current P1, P2 or P3 student

PHM 360 *Serving the Underserved I.* Serving the Underserved is a 1 credit course offered to P1-P3 students with no prerequisites. The course is intended to assist students in overcoming barriers to healthcare on behalf of their patients. Through the use of interactive sessions and patient examples, students should be able to refer patients to appropriate resources or to use the resource themselves. The class will also include activities

that will highlight biases in providing care to patients. The overall objective is to provide a structure for the student to be an advocate for patients and their care. The course will be a stand-alone course. It will not overlap substantially with existing courses, including the US and Global Health Care Systems course. The elective will supplement but not reiterate existing courses. **(1)**

PHM 361. *Serving the Underserved II.* Serving the Underserved II is a 2 credit course offered to P1-P3 students that builds off of the Serving the Underserved I course. This course is intended to increase the depth of knowledge of the materials covered in Serving the Undeserved I course, including insurances and overcoming patient barriers. It will also introduce new topics, such as health literacy. Both courses take a hands-on, interactive approach. Hopefully, the student will complete the course with the feeling that he or she has the ability to assist patients from a variety of backgrounds and with many different barriers to care. **(2); Prerequisite:** PHM 360

PHM 429 *Advanced OTC*. The Advanced OTC course will guide the student pharmacist through an interactive approach to over the counter medications. Students will have the opportunity to take a more in depth look into specific topics while addressing topics not currently covered in the required course: The Pharmacist Role in Self Care. The design of this course is geared towards student pharmacists looking to pursue a career in community pharmacy. **(3); Prerequisite:** PHM 329

PHM 435 *Nephrology Patient Care***.** This course introduces the delivery of patient-oriented pharmaceutical care in nephrology. Students gain an understanding of the chronic kidney disease (CKD) public health epidemic and will be able to identify key roles for pharmacists in managing CKD. Students will develop skills in identifying medication-related problems via patient case discussions that simulate real patient-care issues in nephrology. Complications of CKD, healthcare issues, and healthcare dilemmas will be introduced via group discussion and journal club. **(3); Prerequisite**: Doctor of Pharmacy P1 student

PHM 440 *Pediatric Pharmacy Practice.* Students enrolled in Pediatric Pharmacy Practice will receive an overview of concepts and common pharmacotherapeutic issues related to the practice of pharmacy in the infant and child patient, and develop a level of understanding appropriate for that of a general pharmacist practitioner. The infant and child patient is often one that poses unique challenges to the pharmacist owing to rapid and substantive changes in physiology, behavior, communication, and understanding. These changes often necessitate flexibility and resourcefulness on the part of the pharmacist to assess his or her patient, and arrive at sound drug therapy decisions that are specific for the infant or child. Aside from the uniqueness of the infant or child patient, these decisions are often complicated by a lack of adequate evidence-based medicine, difficulty in communications with the parent or caregiver, and societal misunderstandings and beliefs regarding the healthcare of children. The course objectives will be met by way of a student-centered approach utilizing a mixture of online and in-class lessons, and problem- and team-based learning. **(3); Prerequisite:** current P2 or P3 pharmacy student

PHM 472 *Women's Health Seminar.* Women's Health Seminar will cover a broad range of topics relevant through the lifespan of women. This class will also foster interprofessional relationships by featuring guest lecturers with expertise in these topics. The focus in this class is to increase awareness and understanding of issues that women face and developing sensitivity to these issues. Participants in this class will also examine ways to further the profession in this field. Students will be expected to actively engage speakers through questions and discussion. Students will also be expected to do one presentation and several reflective and informative papers throughout the semester. **(2)**

PHM 517 *Psychopharmacology & Psychopathology in the Media.* Psychopharmacology & Psychopathology in Film & Media is a 3-credit elective course available to PharmD students enrolled in the Doctor of Pharmacy program. This course focuses on the portrayal of psychiatric illness and their corresponding treatments in films

and media. Students enrolled in the course will receive an overview of major psychiatric/neurologic illness and their portrayal within film and media. Representations of psychopathological states in media will be examined within the context of contemporary social issues such as stigma and discrimination with additional emphasis placed on the pharmacotherapeutic treatment of the various disorders. The films accuracy in portraying the disease state, significance and social influence of the film, public perception of mental illness, and advanced concepts in treating psychiatric disorders will also be discussed in the course.

PHM 525 *Advanced Nephrology.* This course introduces topics that will enable students to have an in- depth understanding of contemporary issues in nephrology. It will enable them to participate in a nephrology APPE in an advanced and effective manner and will engender interest in a nephrology residency or fellowship. Students will participate in small group discussions on topical aspects of clinical nephrology, lead and participate in journal clubs with faculty, and be responsible as near- peer instructors for components of the Nephrology Patient Care elective. The Advanced Nephrology elective will be run for one 2- hour session each week to coincide with the Nephrology Patient Care elective. **(2); Prerequisites:** PSL 302, PHM 329, PTP 525 and B or better OR completion of clinical and translational research elective OR independent research elective in nephrology.

PHM 535 *Cancer Screening/Prevention/Early Detection.* This course will review basic concepts of cancer epidemiology, carcinogenesis, and principles of cancer screening and prevention through evaluation of the medical literature and clinical practice guidelines from the NCCN (National Comprehensive Cancer Network), ACS (American Cancer Society), ASCO (American Society of Clinical Oncology), the United States Preventative Services Task Force (USPSTF), and other relevant professional societies. The screening and prevention literature for breast, cervical, prostate, colorectal, and lung cancers will be discussed in detail, with emphasis on the medical literature that supports/refutes the recommendations and the controversies and differences amongst the available guidelines. Other contemporary issues in cancer screening and prevention will be selected by the instructor based on current events and may include critical evaluation of the literature regarding traditional exposure-disease relationships/risk factors for cancer such as genetics, pesticides, radiation, radon, cell phones, red meat, alcohol, tobacco, obesity, sugar, sedentary lifestyle, shift work, etc. as well as any new updates in screening or early detection. This course is offered 50% online and 50% live-in-class; foundational knowledge will be presented in recorded lectures online and live sessions are held to explore controversies and evaluation of the literature through journal clubs, debates, and case-based discussion. Students will also have the opportunity to choose a cancer screening/prevention/early detection topic of their choice and present a summary of primary literature that they find on the topic (this may be as a written paper or as a brief presentation depending on course enrollment). Evaluation is heavily weighted on active participation during the live class sessions. **(3); Prerequisite: Current** P1-P3; 4th year BS student eligible with instructor approval after Doctor of Pharmacy Program registration

PHM 547 *Critical Care Medicine.* Critical Care Medicine will cover topics ranging from those occurring in an Emergency Department that will result in a patient transfer to an Intensive Care Unit as well as health care issues that require a direct transfer and management in an intensive care unit. We will focus on gaining an understanding of life threatening issues and exploring the Pharmacists role as part of a healtcare team in gaining control over life threatening situations that occur daily in healthcare. Pharmacotherapeutic interventions in critically ill patients care will be emphasized. We will be using case based assessments for evaluation throughout the course. Students will be expeceted to participate in an active teaching and learning environment along with participation in an individual or group research exercise where they will develop a treatment protocol for use in a critical care situation. The use of patient cases and SOAP notes will be subject to both oral and written presentation as communication as a whole is a key component to practice in this fast paced environment. **(3)**

PHM 555. *Geriatric Pharmacotherapy.* Geriatric Pharmacotheraphy is designed to introduce students to the concepts of geriatric care and build upon knowledge from the pharmacotherapy sequence with a focus on older adult patients. The course will review physiologic changes and altered presentation of the elderly patient, geriatric syndromes, and pharmacotherapy in older adults. The course will utilize didactic lectures, case-based education, and therapeutic debates. Lessons taught in Geriatric Pharmacotherapy will follow related lessons in the required P2 and P3 PTPM course which will reinforce the pharmacologic and pharmacotherapeutic knowledge and principles. **(3); Corequisite:** Enrollment in required P3 PharmD curriculum or permission of the instructor

PHM 572 *Topics in Family Medicine*. Topics in Family Medicine is a 3 credit hour elective course offered to students in their P3 year that covers a wide range of both inpatient and outpatient family medicine topics including anticoagulation, contraception, hyperlipidemia, hypertension, diabetes, polypharmacy, medication therapy management, and more. The content will be delivered with both didactic lectures and active learning activities. The course is intended to serve as a "bridge" between students' therapeutic modules and experiential rotations. Course activities and assignments will mimic those that students will encounter on rotation, and will include patient case work-ups, formal case presentations, "morning report" presentations, and written drug information responses. Course activities and assignments will allow students to develop their critical thinking, writing, literature evaluation, and public speaking skills. **(3)**

PHM 576 *Concepts in Community Oncology.* Concepts in Community Oncology is a 3-credit hybrid (online/live) elective course designed to develop oral and written communication skills in the student pharmacist that are necessary to deliver effective patient-centered pharmaceutical care to the ambulatory oncology patient. Communicating through writing and public speaking and patient education are skills necessary to interact with both patients and other healthcare providers in direct patient care. Recent trends and newer oral therapies in oncology are geared toward managing patients in an ambulatory setting, enhancing patient convenience. In this ambulatory setting where chemotherapeutic patient self-administration, complicated self-care of managing adverse drug events, and interpretation of cancer literature by the media prevail, the pharmacist plays a key role as an informational resource and educator. Classroom activities will consist of case discussion, and patient counseling exercises based on example real-life patient examples, critique of cancer literature reported in the media, and brief student presentations on new oncology agents and written responses to example patient drug information questions. The online, self-paced portion of the course will consist of weekly pre-recorded lectures and readings to provide the adequate evidence-based information or guidelines on the therapies, cancers, adverse effects, and interview/counseling skills needed for students to successfully participate in the active learning in-class exercises. Students will be exposed to career opportunities in the community and ambulatory oncology by area oncology pharmacists participating in the course, and exposed to the cancer community by a minimum of one field trip to a cancer symptom night support group. Achievement of course objectives will be assessed by completion of the listed activities, active student participation and professional behaviors. The course instructor is located on the Vermont campus and distance technology will be used to transmit to the NY campus. **(3)**

PHM 580 *APhA MTM Certificate*. The American Pharmacists Association national certificate program entitled Delivering Medication Therapy Management Services is an active learning seminar in which participants practice a variety of communication techniques to elicit a patient's medication experience and identify medication-related problems, using cases based on the real-life experiences of MTM providers. Participants will gain experience interviewing patients, identifying and prioritizing medication-related problems, developing and implementing interventions, and documenting activities. Participants explore various business models and billing strategies and discuss plans for implementation. Pre-seminar self-study modules, a case study and hands-on patient interview prepare participants for the live session. After completion of 5 APPE cases, students receive their APhA Certificate. There is a separate fee associated with this course that will be added to the tuition bill. **(1); Prerequisites:** Doctor of Pharmacy Program P1 and P2 year and Fall of P3 year.

PHM 911 *Orientation to Advanced Pharmacy Practice Experiences.* This course provides students with preparation to select and satisfactorily complete their advanced pharmacy practice experiences. Students will meet experiential education personnel and will prepare a personal biosketch, resume, and placement profile. Students will review the APPE Rotation Manual, which includes the calendar; required and elective module requirements; rotation assignment procedure; goals and objectives for advanced pharmacy practice experiences; procedures for assignment to extramural and special arrangement rotations; student guidelines; midpoint and final evaluation procedures; academic regulations; electronic resources on the Web site and portfolios. Students will learn about different practice environments, including community; institutional; specialty practices in ambulatory care or inpatient settings, managed care and administration, that they may consider as potential APPE options. **(0)**

PHY 145 *Physics of Sound/Music.* This course is a one-semester introductory level course that discusses fundamental scientific principles of waves, sound, and music. The concepts of energy, harmonic oscillation, resonance, harmonic analysis, interference, diffraction, traveling waves and standing waves are treated quantitatively. Relationship of physical characteristics of sound waves to loudness, pitch, and timbre is discussed. The course requires proficiency in algebra (intermediate level) and trigonometry (elementary level) and credit for a physics course at a high school level or above. **(3)**

PHY 201/212 *College Physics I.* This course is the first part of a two-semester physics sequence. Basic principles underlying physical phenomena will be studied. These principles form a foundation of our understanding of chemistry, biology and pharmaceutical sciences. Emphasis will be on solving qualitative and quantitative problems using a variety of mathematical methods. The topics will include one- and two-dimensional kinematics; Newtonian dynamics; work and energy; linear momentum; physics of fluids and solids; oscillations and waves; and applied nuclear physics. The laboratory portion of the course complements its theoretical component and will in particular familiarize students with modern experimental techniques and skills including computerized data collection. PharmD students register for PHY 212, BS students register for PHY 201. **(4); Prerequisite:** MAT 121. *Lecture and Laboratory*

PHY 202/222 *College Physics II.* This course is the second part of a two-semester physics sequence and a continuation of Physics I. Basic principles underlying physical phenomena will be studied. These principles form a foundation of our understanding of chemistry, biology and pharmaceutical sciences. Emphasis will be on solving qualitative and quantitative problems using a variety of mathematical methods. The topics will include foundations of thermodynamics and kinetic theory; electricity and magnetism; electromagnetic waves and elements of physical and geometrical optics. The laboratory portion of the course complements its theoretical component and will, in particular, familiarize students with modern experimental techniques and skills including computerized data collection. PharmD students register for PHY 222, BS students register for PHY 202. **(4); Prerequisite:** PHY 201/212; *Lecture and Laboratory*

PHY 245 *Physics for Life Sciences.* This course is a one-semester algebra-trigonometry-based introductory physics course. Fundamental principles underlying physical phenomena will be studied. These principles form a foundation of our understanding of chemistry, biology and pharmaceutical sciences. Emphasis will be on solving qualitative and quantitative problems using a variety of basic mathematical methods. The topics will include kinematic description of motion; Newtonian dynamics; the concepts of work and energy; energy conservation law; mechanics of fluids; introduction to nuclear physics; heat and temperature, charges and Coulomb's Law; introduction to electric circuits; and geometrical and physical optics. The laboratory portion of the course complements its theoretical component and, in particular, will familiarize students with modern experimental techniques and skills including computerized data collection. **(4); Prerequisite:** MAT 111; *Lecture and Laboratory*

PHY 316 *Physics in Nuclear Medicine and Pharmacy.* Nuclear medicine uses the nuclear properties of matter for medical purposes. As a part of the diagnostic procedure, radionuclides (radiopharmaceuticals) are administered and the radiation emitted is used to form images. These images reflect biological processes that take place at the cellular and subcellular level. Nuclear pharmacy is a specialty area of pharmacy practice dedicated to the compounding and dispensing of radionuclides for use in nuclear medicine procedures. This course is a one-semester introductory level course that discusses fundamental principles underlying physical phenomena related to the fields of nuclear medicine and nuclear pharmacy. The topics will include basic atomic and nuclear physics, radioactivity and its decay, methodology of radiopharmaceutical production and instrumentation used for production of radionuclides, radiation detectors, basic ideas of positron emission tomography (PET), radiation dosimetry, radiation protection and safety and fundamentals of health physics. We will discuss examples of clinical applications of nuclear medicine/pharmacy for different systems and diseases. The course emphasizes critical thinking and problem solving skills, and students are expected to become proficient at manipulating the quantities and units used in the radiation sciences. The course will include field trips to local nuclear pharmacy facilities and guest lectures given by local nuclear pharmacists. **(3); Prerequisite:** PHY 202/222

PSC 110 *Scientific Reasoning and Analysis I - The Educated Scientist.* The courses (PSC110, PSC111 and PSC112) that make up the SRA sequence focus on historical and contemporary topics in science. These courses will focus on the development of communication and critical thinking skills in addition to their scientific content. SRA1 is focused on the use of data to support hypotheses by evaluating both historical and appropriate and inappropriate uses of data. **(2)**

PSC 111 *Scientific Reasoning and Analysis II - The Ethical Scientist.* The courses (PSC110, PSC111 and PSC112) that make up the SRA sequence focus on historical and contemporary topics in science. These courses will focus on the development of communication and critical thinking skills in addition to their scientific content. SRA 2 is focused on clinical implications of science and medicine with an underlying theme of exploring historical and contemporary medical breakthroughs as well as contemporary issues in the US healthcare system. **(2)**

PSC 112 *Scientific Reasoning and Analysis III - The Scientist in Society.* The courses (PSC110, PSC111 and PSC112) that make up the SRA sequence focus on historical and contemporary topics in science. These courses will focus on the development of communication and critical thinking skills in addition to their scientific content. SRA 3 is focused on using previously collected data to produce a testable hypothesis. Presentation of scientific data and building support for hypothesis and career related uses for scientific degrees. **(2)**

PSC 210 *Pharmaceutical Sciences Research Experience.* This elective course will allow students to pursue a laboratory-based research. The student and research mentor will work together to define a series of experiments that will achieve the student's individual goals. This course may serve as an initial experience for a student to determine their level of aptitude and interest in pursuing research or, for more senior students, it will support a more detailed investigation of a defined hypothesis. The student will learn the necessary techniques, conduct experiments and analyze data under the guidance of the research mentor. Work on the project may or not be continued in subsequent offerings of Pharmaceutical Sciences Research Experience or, for BSPS students, through enrollment in the Thesis Option of the BSPS program. Students are expected to be actively involved in research or other laboratory work for a minimum of 125 hours for three credit hours of the course (42 hours/credit) and not more than 150 hours over the semester (50 hours/credit). Final grades will be assigned by the course coordinator. **(1-6); Prerequisites:** Permission of the instructor and course coordinator

PSC 231 *Real World Health Care.* This course will discuss the role of healthcare systems in improving human health and compare the US healthcare system to that of various other healthcare systems of the world. Topics will include disease prevention vs. treatment, comparison of the US healthcare system to those of other

developed countries and the current status of health care in developing countries. Discussions will also focus on the availability of healthcare for people of varying economic and social classes, ethnicity, and with different diseases/ailments. Class time will be divided between online discussions, student based presentations and seminar style discussions. The course is designed to be relevant to students who are considering a career in medicine. **(3).**

PSC 261 *Topics in Pathophysiology and Medicine.* Students will build on their knowledge of various topics in pathophysiology and medicine by reading, discussing, analyzing and interpreting data from the scientific literature. Students are expected to be active participants in presenting, discussing, critiquing and interpreting the data throughout the semester. This course will begin with discussions and reading focused on background information and build to student led evaluation of primary journal articles. **(3); Prerequisites:** BIO 111 and 121

PSC 281 *Neuroscience I*. Neuroscience I will provide an introduction to the cellular structure, anatomical organization, physiological function and pathophysiology of the central nervous system. It will cover brain anatomy, discuss sensory systems and sensory perception, review motor function and its control and show how the structure and neuronal 'wiring diagram' of the brain mediate specific brain functions. The course will also discuss neurophysiology and electrochemical information processing in the brain. Lastly, the course will focus on pathophysiologic mechanisms underlying neurologic diseases, including brain imaging analyses and case studies, and discuss treatment modalities. Neuroscience I is a basic neuroscience course focused primarily on students with a strong interest in neuroscience and in pursuing research and/or more advanced courses in neuroscience. **(3); Prerequisite:** BIO 102/121

PSC 282 *Neuroscience I Laboratory*. Neuroscience I Laboratory will provide a hands-on opportunity to study the brain. Students will investigate the cellular and anatomical substrates of brain function and dysfunction through microscopy, brain dissection and by using interactive models. The laboratory syllabus will be correlated with the lecture sequence for Neuroscience I. **(1); Prerequisite:** BIO 102/ 121

PSC 283 *Neuroscience II: Applications.* Neuroscience II explores the diversity of research and clinical applications in the field of Neuroscience. From pharmacotherapy, to the underlying mechanisms associated with nervous system vulnerability and pathogenesis. This diversity is highlighted by focused modules in neurodevelopment, learning and memory, the nature of neuroimmune interactions as effectors of neurological disorders and disease outcomes, genetic determinants of behavior and the deleterious consequences of environmental chemical exposures. The modules are designed to appeal to both the novice and those with prior exposure to Neuroscience. The different approaches used in diagnosis and understanding physical impairment are stressed as essential components of devising effective therapy and future research directions. **(3); Prerequisites:** BIO 102 or BIO 121 and CHE 102 or CHE 121

PSC 311 *Biochemistry*. Biochemistry provides an introduction to important biomolecules and the complex structures and cellular pathways in which these molecules are involved. The first section of the course focuses on proteins with emphasis on enzyme structure and function, kinetics, and reaction mechanisms. Following an examination of simple and complex carbohydrates and lipids, the remainder of the course focuses on metabolic pathways that are responsible for cellular ATP production (glycolysis, citric acid cycle, and electron transport), fatty acid synthesis and breakdown, cholesterol biosynthesis, and pentose phosphate metabolism. The metabolic intermediates and signal transduction pathways involved in the regulation of key rate limiting enzymes for each pathway provide a focus for understanding how this regulation facilitates functional integration of these metabolic pathways in a number of different cell types. **(3); Prerequisite:** CHE 221

PSC 312 *Molecular Biology.* An analysis of the regulatory pathways controlling cell replication, gene expression, and protein synthesis with a central focus of understanding how such knowledge is foundational to therapeutic application and development. Cancer cells, retroviruses, and bacteria serve as thematic models to

demonstrate how the principles embodied in these studies translate into functional applications. Problem solving and data analysis play a central role in reinforcing didactic material and fostering student intellectual development. In addition to canonical topics, specialized subjects such as dideoxynucleotide therapeutics, RNAi, viral vectors in gene therapy, stem cells, and cloning are discussed to illustrate both the practical—and potential—applications of this ever-evolving field. **(3); Prerequisite:** PSC 311

PSC 315 *Immunology.* This course is devoted to the study of host defense and the immune system. It examines the cells and organs of the system. It also explores the complex mechanism of cell-cell cooperation necessary to produce immune responses. The role of antibodies, T cells and macrophages in host defense and diseases are thoroughly explored. The role of the immune system in hypersensitivity, autoimmunity and transplantation is carefully examines. In addition, methods for modifying immune responses through drugs and vaccines are discussed. **(3); Prerequisites:** BIO 111, BIO 121 and PSC 311 or concurrent enrollment in PSC 311

PSC 316 *Advanced Immunology.* This course will further explore concepts introduced in Immunology that did not receive extensive discussion in the basic course. Topics of specific interest to the students in the class will be covered and may include: the molecular biology of generation of diversity of antibodies, immunogenetics of disease states and transplantation, modification of immune responses including tolerance induction and immunosuppressive drugs and psychoneuroimmunology with a discussion of the endocrine-neuro-immune axis. **(3); Prerequisite:** PSC 315 or permission of the instructor

PSC 317 *Advanced Genetics.* With an emphasis on human populations, this course serves to introduce students to the many specialized branches of the science of genetics. Although classic subjects including Mendelian genetics, pedigree analyses, and population genetics are covered, diverse topics—ranging from chromosome evolution to developmental programs to eugenics—serve to highlight the diversity inherent in the field. Although based on core lecture series, supplemental readings from authors such as Stephen Jay Gould, problem sets, and integrated recitations facilitate academic growth in several essential areas. A centerpiece of the genetics course involves the completion of a semester-long project that challenges students to identify a gene based on a DNA sequence fragment, the role this gene plays in inherited disorders, and the current state of research into this genetic disease. This project culminates in a review-style paper, which, in addition to facilitating writing skills, affords students the opportunity to develop a level of expertise and understanding for the impact that congenital disorders have on individuals—and the drive towards developing treatments. **(3); Prerequisite:** BIO 121

PSC 321 *Physiology/Pathophysiology I.* This course sequence will focus on normal physiological principles of homeostatic regulation of the human body. Important anatomical structures, pathologies and disease states will be presented to support underlying physiological regulation. Physiology/Pathophysiology I will include in-depth discussions of the physiology and pathophysiology of cell structure, electrophysiology, the nervous systems and the cardiovascular system. **(4); Prerequisites:** BIO 102/121

PSC 322 *Physiology/Pathophysiology II.* This course sequence will focus on normal physiological principles of homeostatic regulation of the human body. Important anatomical structures, pathologies and disease states will be presented to support underlying physiological regulation. Physiology/Pathophysiology II will include in-depth discussions covering physiology and pathophysiology of the respiratory system, renal system, endocrine systems and gastrointestinal/hepatic systems. **(4); Prerequisites**: BIO 102/121

PSC 330 *Enthnopharmacology.* Ethnopharmacology can be defined as, the interdisciplinary investigation of biologically active substances found in nature and used by humans. As such, ethnopharmacology is at the interface between medicine and culture, between pharmacology and anthropology. The field incorporates elements of classical botany, natural products chemistry, pharmacology, anthropology and even psychology and comparative religion. Although, technically, the term could apply to the study of drugs by modern,

Western society, most work in the field concerns the use of natural products by indigenous, pre-modern cultures or in traditional medical practices. Ethnopharmacology has been the source of many new drugs used in Western medicine and continues to be an important target for drug development. This course will provide an overview of the broad field of ethnopharmacology, including drug development from natural products, and will focus on the use of psychoactive plants by diverse cultures. The course will be largely discussion based and class discussions will rely on student knowledge from assigned readings. Lectures will be kept to a minimum. The class will review papers, analyze data and discuss controversial elements of ethnopharmacology, drug development, intellectual property and cross-cultural differences in the use of natural products. Assessment will be based on two relatively brief research reports, class presentations, participation in class discussions and two essay type examinations. Students will be encouraged to pursue topics of their own interest. **(3)**

PSC 331 *Pharmaceutical Sciences Problem Solving Workshop I.* The Pharmaceutical Sciences Problem Solving Workshops will integrate information from the courses offered during that term (as well as previously mastered material) in a way that assists students in mastering course material in an active learning environment and in a manner that helps to develop problem solving skills. In addition, these workshops are designed to cross disciplinary boundaries to foster deeper understanding of the material by the student. Students will be expected to use critical thinking skills, effectively communicate through speaking and function effectively in small group sessions. The workshops will be led by near-peers under the direction of appropriate faculty members. **(1)** *(identical to IPS 301)*

PSC 332 *Pharmaceutical Sciences Problem Solving Workshop II.* The Pharmaceutical Sciences Problem Solving Workshops will integrate information from the courses offered during that term (as well as previously mastered material) in a way that assists students in mastering course material in an active learning environment and in a manner that helps to develop problem solving skills. In addition, these workshops are designed to cross disciplinary boundaries to foster deeper understanding of the material by the student. Students will be expected to use critical thinking skills, effectively communicate through speaking and function effectively in small group sessions. The workshops will be led by near-peers under the direction of appropriate faculty members. **(1)**

PSC 334 *Methodologies for Research and Evaluation of Medicinal Plants*. The use of medicinal plants (herbals, botanicals) to treat human diseases comes from ancient times and, with the development of new technologies, a number of new drugs have been discovered. According to the World Health Organization, 80% of the population of developing countries rely on medicinal plants and other traditional medicines and, in the US, approximately 55% of patients use medicinal plants or other complementary medicines to alleviate health care problems. This course will provide a broad perspective on the current state of knowledge of medicinal plants, discuss the use of medicinal plants by indigenous cultures and review the medicinal use of specific plants in the US and developing countries. A major focus of the course will be on the discovery of new medicinal plants through bioprospecting and on the methods used to investigate the active constituents of medicinal plants, to analyze specific plant chemicals and to validate their biological and/or biomedical properties. The course will focus predominantly on medicinal plants used in the upper and lower Amazon regions of Peru. Students may also have the opportunity to conduct field work in the Amazon rainforest and to participate in research on medicinal plants at the Universidad Nacional Agraria de la Selva in Tingo Maria, Peru, and/or in ACPHS research laboratories as a separate course offered during the summer semesters. **(3); Prerequisites:** BIO 102/121

PSC 335 *Drugs of Abuse:* This course provides a basic introduction to the neuropharmacology of licit and illicit psychoactive drugs. It will review the major classes of licit and illicit drugs, including alcohol, opiates (morphine, oxycodone), psychostimulants (caffeine, cocaine, amphetamine, khat), marijuana, hallucinogens (psilocybin, mescaline), MDMA, dissociative anesthetics (ketamine, PCP) and hypnotics (benzodiazepines). The course will focus on the acute and long-term pharmacological, psychological, behavioral and adverse effects

produced by these drugs and explore the cultural, historical and religious context for their use. The neural mechanisms responsible for drug addiction will also be reviewed and both pharmacological and non-pharmacological treatments for addiction will be discussed. **(3); Prerequisite**: PSC 321.

PSC 341 *Pharmaceutics I*. The Pharmaceutics course sequence focuses on the principles of drug delivery and product design. Pharmaceutics I introduces the physical, chemical and mathematical principles, theories, terminology, calculations and methodologies of physical pharmacy, dosage forms and drug delivery systems. The topics include properties of solutions, solution dosage forms, equilibrium and kinetics in solutions, properties of dispersions, dispersion dosage forms, preformulation, quality standards, new drug development and the drug approval process. **(3); Prerequisites:** BIO 111, BIO 121, CHE 121, CHE 221, PSC 311, MAT 111, PHY 222 or Permission of the instructor

PSC 342 *Pharmaceutics II*. The Pharmaceutics course sequence focuses on the principles of drug delivery and produce design. Pharmaceutics II covers the foundations of physical pharmacy and biopharmaceutics. The physical, chemical, mathematical and biological principles are applied to the design of dosage forms and drug delivery systems. Commonly used pharmaceutical ingredients and manufacture methods are introduced. Topics include principles of biopharmaceutics, topical and transdermal drug delivery, solid dosage forms and oral drug delivery systems, sterile products, nasal and pulmonary drug delivery, specialty products, advanced drug delivery systems and novel drug delivery strategies. **(3); Prerequisite:** PSC 341 or Permission of the instructor

PSC 351 *Alternative and Complementary Medicine.* This course will examine complementary and integrative medicine practiced in the United States. The course will examine the underlying cultural assumptions and world views of allopathic and complementary medical systems and introduce students to both mechanistic and holistic belief frameworks. Systems such as homeopathy, chiropractic, osteopathy and Western herbalism will be discussed, as well as techniques or approaches including touch therapies, aromatherapy and light therapy. Systems that stress integration of mechanistic with personalistic beliefs will also be discussed, including naturopathic, traditional Chinese medicine and ayurvedic practices. The role of the mind in wellness and the concept of mind/body medicine will be integrated throughout the course. In presentations, students will be required to investigate systems or techniques within the integrative medical spectrum which interest them. **(3); Prerequisites:** BIO 111 and 121

PSC 369 *Molecular Foundations of Drug Action I.* This course explores the fundamental principles that define the relationship between chemical structure and the biological action of drug molecules. A major focus of the course is the application of these chemical principles to biopharmaceutical properties of drugs and the molecular mechanisms of pharmacological activity. The relationships between drug structure, therapeutic properties, and physicochemical characteristics will be discussed. Structure activity relationships (SAR), structure-property relationships (SPR) and ADME (absorption, distribution, metabolism, and excretion) will be explored through case studies. **(3);** Prerequisites: CHE211; CHE 221; PSC 311

PSC 410 *BSPS Thesis I.* This course is required for all BSPS students registered for the Thesis Option. Participation in Thesis I requires completing an accepted application to the BSPS Thesis Option including the approval of the Director of the BSPS Program and the Pharmaceutical Sciences Department Chair. Students will work with an identified faculty mentor to develop a thesis proposal which will provide appropriate background, hypothesis, specific aims and methods for the thesis work to be conducted as part of BSPS Thesis Research I. The written thesis proposal will be in the format of an NIH grant application. The thesis proposal must be approved by the faculty mentor. Student will prepare and present a seminar of their thesis proposal. This course can be taken prior to or concurrently with BSPS Thesis Research I. The faculty mentor will assign the BSPS Thesis I grade. **(3)**

PSC 411 *BSPS Thesis II.* This course is required for all BSPS students registered for the Thesis Option. This course must be taken concurrently with BSPS Thesis Research II and students must have completed BSPS Thesis I and BSPS Thesis Research I. Students will be responsible for writing a senior thesis based on the research data generated in Thesis Research I and II as outlined in the thesis proposal produced in Thesis I. In addition, students will prepare a seminar that describes the research project, results obtained and the conclusions that can be drawn from the research. The seminar will be presented to the ACPHS community. The written thesis will be submitted to the thesis mentor prior to the seminar presentation and revised according to the thesis mentor's critique. If the seminar and the revised thesis are found to be acceptable by the thesis mentor, the thesis mentor will approve the thesis. The mentor will assign the BSPS Thesis II grade. **(3); Prerequisites:** PSC 410 and PSC 412

PSC 412 *BSPS Thesis Research I.* BSPS Thesis Research I is the foundational course for students pursuing the Thesis Option within the BSPS program. Under guidance of the faculty mentor and as outlined in the thesis proposal produced in BSPS Thesis I, students will develop a novel research hypothesis, design and execute experiments to test the hypothesis, and accumulate and analyze data. The foundational work of BSPS Thesis Research I is expanded upon, refined, and brought to conclusion in BSPS Thesis Research II. **(3)**

PSC 413 *BSPS Thesis Research II.* This course is a continuation of work begun in BSPS Thesis Research I. Students will continue to refine their laboratory skills, address problems identified in previous studies, and pursue new avenues of research opened up by their experiments. At the conclusion of BSPS Thesis Research II, students will present their findings in seminar and detail their findings in writing as part of the course BSPS Thesis II. **(3); Prerequisite:** PSC 412

PSC 421 *BSPS Thesis Seminar.* Students pursuing the thesis option will register for BSPS Thesis Seminar concurrently with BSPS Thesis 2. Once the thesis research is completed, the research results will be summarized in written form in the style of a manuscript that can be submitted for publication. The student will also prepare and present a seminar that describes the complete thesis research project, from the background research that led to the formation of the research hypothesis, to the discussion of the results of the studies. The seminar will be presented in a public forum and should represent the culmination of the thesis project. **(1)**

PSC 431 *Foundations of Pharmaceutical Sciences.* This introductory course is required for BS Pharmaceutical Sciences students. The course reviews the foundational topics in Pharmacology/Medicinal Chemistry, setting the stage for subsequent courses in Pharmacology/Medicinal Chemistry. Topics covered include principles of receptor and ligand interactions, dose response curves, pharmacokinetics (absorption, distribution, and elimination of drugs), pharmacodynamics (drug concentration and effect), biotransformation of drugs, enzyme polymorphisms, and factors affecting drug action. **(2); Prerequisites:** PSC 311, PSC 312, PSC 321 and PSC 322

PSC 432 *Infectious Disease Pharmacology*. This course is required for all BS Pharmaceutical Sciences students enrolled in the Pharmacology concentration. The course covers major anti-infective drug classes including antibiotic, antimycobacterial and antiviral drugs. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of model compounds from each drug class will be considered. **(2); Prerequisite:** PSC 431

PSC 433. *Neuropharmacology.* This course is required for all BS Pharmaceutical Sciences students enrolled in the Pharmacology concentration. The course focuses on drugs that affect the central and peripheral nervous systems including autonomic drugs, antipsychotics, antidepressants, and analgesics. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of each drug class will be considered. **(3); Prerequisite:** PSC 431

PSC 434 *Cardiovascular Pharmacology*. This course is required for all BS Pharmaceutical Sciences students enrolled in the Pharmacology concentration. The course covers cardiovascular and anti-inflammatory drugs. Specific topics to be covered include antihypertensive, diuretic, anti-dyslipidemic and anti-arrhythmic drugs, NSAIDS and other anti-inflammatories. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of each drug class will be considered. **(3); Prerequisite:** PSC 431

PSC 441 *Pharmacokinetics*. This course presents concepts and mathematical techniques used to describe the time course of drug disposition in biological systems using compartmental and non-compartmental analysis. Biopharmaceutical and pharmacokinetic principles used in the selection, dosing, monitoring and evaluation of drug therapy are introduced. These principles are applied to evaluation of drug literature and development of drug dosage regimens of selected classes of drugs for individual patients. **(3); Prerequisites**: PSC 341 and PSC 342

PSC 445 *Drug Discovery and Development*. This course multi-disciplinary course will cover all components of drug discovery and development, from the bench to the bedside, including pharmacology, medicinal chemistry, molecular biology, biochemistry, immunology, formulation, delivery, pharmacokinetics, regulatory affairs, clinical research, marketing, business development, sales, medical affairs and patent filing. The course will be presented by the instructor and by experts from various pharmaceutical and biotechnology companies (moderated by the instructor). **(3); Prerequisites**: PSC 311, PSC 312, and PSC 431 or PTP 401 or concurrent enrollment in PSC 431 or PTP 401

PSC 446 Regulatory Science. Regulatory science is the science of developing new tools, standards and approaches to assess the safety, efficacy, quality and performance of drugs, biologics, medical devices, cosmetics and other products. This course introduces and examines the current US feral regulatory system on the regulated products, and discussed the functions and operations of the FDA. The current trend of the Harmonization of worldwide pharmaceutical regulations is also discussed. The course also introduces the practice of regulatory affairs, and teaches the principles, ethics and strategies of this profession. **(3); Prerequisites:** PSC 341

PSC 447 *Fundamentals of Drug Metabolism and Pharmacokinetics in Drug Development and Clinical Trials.* This is a multidisciplinary course that focuses on the in vitro and in vivo pharmacokinetics, pharmacodynamics and drug metabolism (PPDM) evaluations of lead compounds, as recommended by the FDA and ICH guidelines. The course is designed to increase understanding of the important roles and applications of the three disciplines in pre-formulation, pre-clinical and clinical investigations of future therapeutic entities; including small molecules and biologic drugs. The course consists of lectures, take–home assignments, in class participation and discussion, and data analysis. The complementary topics of the course include toxicokinetics, safety pharmacology, biopharmaceutics, drug delivery systems and experimental design. The emphasis is on the role of PPDM in drug development from target selection through clinical trials. **(3); Prerequisite**: 3rd year curriculum of BSPS, or PharmD programs, or permission of the course coordinator

PSC 451 *Scientific Literature Evaluation (SLE).* This course will teach students how to evaluate scientific literature and prepare a seminar. The course will be divided into sections of approximately 24 students and each section will focus on a specific topic or body of knowledge. Students will have multiple opportunities to give short presentations that focus on data analysis and literature evaluation. Students will develop evaluation and presentation skills throughout the course, initially by presenting sections of scientific articles selected by faculty and, subsequently, by choosing articles, themselves, for presentation. Throughout the course, student's continual and active engagement in discussions focused on critical analysis of the scientific literature will build confidence and comfort in thinking critically about the scientific literature and promote evidence based decision making. Discussions will include appropriateness of sample populations selected, comparison groups used, medical ethics, statistical significance, clinical significance and evidenced based recommendations. This

course will thus provide students with multiple opportunities to present and discuss data and to present a scientific seminar. **(1); Prerequisite:** PHD 410

PSC 452 *Pharmaceutical Sciences Journal Club.* This course is designed to enhance the ability of students to critically evaluate scientific articles published in juried scientific journals. Articles will be selected from current scientific literature in a variety of disciplines in the pharmaceutical sciences, including drug delivery, drug development, medicinal chemistry, molecular biology, pharmacogenomics, pharmacology, physiology, biochemistry and pharmaceutics. All participants will read and critique the articles. Each student will present at least two articles per semester. **(1); Prerequisites:** PSC 311, PSC 312, PSC 321, PSC 322 and PSC 431 or PTP 401 or concurrent enrollment in PSC 431 or PTP 401 or permission of the instructor

PSC 631 G *Foundations of Pharmaceutical Sciences.* The course reviews the foundational topics in Pharmacology, Pharmaceutics and Medicinal Chemistry, setting the stage for subsequent courses in the MSPS program. Topics covered include principles of receptor and ligand interactions, dose response curves, pharmacokinetics (absorption, distribution, and elimination of drugs), structure-activity relationships, pharmacodynamics (drug concentration and effect), biotransformation of drugs and factors affecting drug action, principles of computational modeling of receptor-drug interactions, and rational drug design. **(3); Prerequisites:** PSC 311, PSC 312, PSC 321, PSC 322, or Permission of instructor

PSC 635 G *Pharmacologic Regulation of Signal Transduction.* This course focuses on signaling pathways that transfer signals across cell membranes and within the cell and allow for regulation and integration of all aspects of cell function. Key signaling molecules, including receptors, G-proteins, second messengers, and transcription factors, as well as the small molecule ligands, activators and inhibitors, will be examined. Concepts and methodologies that have facilitated elucidation of the function of these molecules will be introduced through discussion of past and current landmark papers. The goal of the course is to provide students with a fundamental understanding of signaling pathway function and regulation. This understanding will be placed in the context of drug action through examination of examples of a variety of drugs which act via modification of signaling pathways. (3); **Prerequisite**: PSC 631 G or Permission of instructor

PSC 636 G *Neuronal Systems Pharmacology*. The course covers autonomic drugs, CNS drugs, including anesthetics, sedative hypnotics, antidepressants, antipsychotics, anti-seizure drugs, analgesics, and anti-Parkinson agents, and drugs used to treat endocrine disorders, including calcium disorders, hypothalamus, pituitary, and thyroid problems, anti-androgens, anti-estrogens and progestins, and drugs used to treat diabetes and hypoglycemia. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of each drug class will be considered. **(3); Prerequisite:** PSC 635 G or equivalent

PSC 645 G *Drug Delivery Principles*. This course studies physicochemical and biological principles of drug delivery and pharmaceutical product design. These principles of physical pharmacy and biopharmaceutics are the foundations for drug candidate selection, pre-formulation, formulation design, and drug delivery systems. Targeted drug delivery and advanced systems for various routes of administration are also discussed by case studies. **(3); Prerequisites:** PSC 341/342 or PSC 431/631 or equivalent

PSC 646 G *Regulatory Science*. Regulatory Science is the science of developing new tools, standards and approaches to assess the safety, efficacy, quality, and performance of healthcare products, according to the definition by the US Food and Drug Administration (FDA). This course provides an overview of the regulatory process from new discoveries to commercialization, for drugs, biologics, and other healthcare products. We examine the history and current status of the US federal regulations, and review the current operations and policies of the FDA. Global regulatory strategies are discussed by highlighting common scientific foundations, principles, rationales, and relationships of the laws, ethics, economics and clinical practice. Students learn this emerging discipline through active learning activities in classroom, such as dialogues with instructors and guest

speakers, simulation games, case studies, presentations and group debates. The course is designed as interdisciplinary learning experiences for senior undergraduate, graduate, PharmD and other professional students, who are interested about a regulatory career or applying regulatory principles, knowledge and skills to research, business or healthcare practice. **(3); Prerequisite:** PSC 341 or 645 or equivalent

PSC 651 G *Pharmaceutical Sciences Journal Club.* This course is designed to enhance the ability of graduate students to critically evaluate scientific articles published in juried scientific journals. Articles will be selected from current scientific literature in a variety of disciplines in the pharmaceutical sciences, including drug delivery, drug development, medicinal chemistry, molecular biology, pharmacogenomics, pharmacology, physiology, biochemistry and pharmaceutics. All participants will read, present, and critique the articles. Each student will present at least two articles per semester. **(1)**

PSC 661 G *Research Rotation.* Students will complete a one semester laboratory rotation in order to facilitate the selection of a thesis research advisor. Students will select a potential mentor based on interests and availability of openings in any given lab. Assignments, based on student preferences, will be made by the Director of the Pharmaceutical Sciences graduate program. Students are expected to spend a minimum of 10 hours per week on laboratory research during the rotation. Students will complete a rotation through a minimum of 1 lab and a maximum of 2 labs during the semester. They are to meet with the faculty advisor at least one hour per week for basic introduction to laboratory principles and practices, and to discuss their research. Students are required to complete reading assignments as directed by the faculty advisor and write a report of the research data and present a ten minute talk summarizing their research at the end of the rotation. **(2); Prerequisite:** Permission of program director

PSC 672 G *Experimental Design and Data Analysis*. This course is required for all Pharmaceutical Sciences graduate students and provides students with a basic knowledge of experimental design and biostatistics. Students will learn how to design experiments and analyze the results. The course will cover single factor experiments, multiple factors, full factorial and fractional factorial designs and screening designs, the fundamentals of hypothesis testing and relevant biostatistics. **(2)**

PSC 732 G *Cardiovascular Pharmacology.* This course provides an in depth review of cardiovascular pathophysiology and pharmacology. The course reviews current concepts on the molecular mechanisms of cardiovascular function and the mechanism of action of drugs used to treat cardiovascular diseases. **(2)**; **Prerequisite:** Permission of the instructor

PSC 733 G *Pharmacology and Molecular Genetics of Cancer.* This course includes a study of the molecular-genetic mechanisms underlying tumorigenesis, including the role of oncogenes, tumor suppressors, and pathogens (viruses and bacteria). Genomic approaches to the study of both hereditary cancers and somatic mutations will be explored. The pharmacology of current cancer therapeutics and the rational design of novel anti-cancer drugs will be discussed throughout the course. **(3); Prerequisite:** PSC 631 or permission of the instructor

PSC 736 G *Immunopharmacology.* Immunopharmacology will explore the immune system from a pharmacological viewpoint. After a short review of the basic concepts of immunity, the course will closely examine the role of antibodies in immunodiagnosis, and immunotherapeutics. The immunotherapeutics portion of the course will examine the roles of vaccines and antibodies in modifying immune responses as well as drugs which modify immune responses in allergy and asthma, cancer therapies, immunosuppressives, biologics, immunotoxicology and dietary and plant immunomodulators. **(3); Prerequisite:** Permission of the instructor

PSC 738 G *Environmental Health: Toxicology, Regulation and Economics.* This course is designed to provide students with an introduction to and overview of the key areas of environmental health. Using the perspective of the population and community, the course will cover factors associated with the development of environmental health problems. Students will gain an understanding of the interaction of individuals, communities, and economic activity with the environment, the potential impact on health of environmental agents, and specific applications of concepts of environmental health. The course will cover principles derived from core environmental health. The sequence of major topics begins with background material and the tools of the trade (environmental epidemiology, environmental toxicology, environmental policy and regulation). The course then covers specific agents of environmental diseases (e.g., microbial agents, ionizing and non-ionizing radiation). Finally, applications and domains of environmental health are addressed (e.g., water and air quality, food safety, waste disposal, occupational health, and injuries). **(3)**

PSC 739 G *Introduction to Psychoneuroimmunology.* This course examines the interaction between psychological processes and the nervous and immune systems. It integrates a substantial number of disciplines, including genetics, immunology, medicine, endocrinology, neuroscience, psychology and sociology. It is an integrative approach to both research and health care. The course will also cover the physiological functioning of the neuroimmune system in health and disease, disorders of the immune system, such as autoimmune diseases, hypersensitivities, and how psychological states, such as anxiety and depression, impact the neurological and immune systems and lead to the development or exacerbation of infections, heart disease, diabetes, and multiple sclerosis. **(3); Prerequisite:** PSC 672 G

PSC 741 G *Pharmacokinetic Modeling.* This pharmacokinetics course is an elective course for Pharmaceutical Sciences graduate students (Pharmaceutics Track). The course presents concepts and mathematical techniques for description of the time course of drug disposition in biological systems. The course also presents biopharmaceutical and pharmacokinetic principles used in the selection, dosing, monitoring and evaluation of drug therapy. At the end of the course the student should be able to find, obtain, understand, analyze, evaluate, and synthesize pharmacokinetic information and make informed, rational, and responsible evaluation of drug dosage regimens. **(3); Prerequisite:** Permission of the instructor

PSC 742 G *Drug Discovery and Drug Development.* This is a translational and multi-disciplinary course that deals with all components of drug discovery and development from the bench to bedside and from concepts to molecules to medicines. This will include pharmacology, medicinal chemistry, molecular biology, biochemistry, immunology, formulation, delivery, pharmacodynamics, pharmacokinetics, pharmacogenomic, regulatory affairs, clinical research, clinical trials and evidence based medicine, marketing, business development, sales, medical affairs and patent filing. This course will be presented by the course coordinator who will be supported by experts from various pharmaceutical and biotechnology companies, and will include a number of case studies to illustrate the development of several blockbuster drugs. **(3); Prerequisite:** PSC 631

PSC 743 G *Pharmaceutical Stability.* This course studies the factors that influence drug stability, the mechanism of degradations, the methods to predict the stability, and strategies of stabilization. It also combines fundamentals and applied perspectives on the pharmaceutical stability assessment, which introduce the methods to analyze stability and determine shelf-life. An overview of the current industrial practices for stability testing is also provided. **(3) Prerequisite:** Permission of the instructor

PSC 744 G *Special Topics in Pharmaceutics.* This course is designed to allow students to study diversified subjects of current interest which are not available in other courses. The subjects are related to physical pharmacy, biopharmaceutics, drug delivery, drug development and/or formulation design. The course is conducted through lectures, tutorial studies, library assignments and/or research projects in the selected areas of advanced study. The student, under faculty advisement, must propose a course plan to the MSPS program director. **(1-3); Prerequisites:** PSC 645 G or permission of the instructor

PSC 756 G *Chemical Biology.* Chemical biology is a diverse and evolving field involving chemical approaches to studying and manipulating biological processes. In this course, students will develop an understanding of chemical reactions utilized in the synthesis of small molecules and macromolecules, and of the chemical principles underling enzyme functions and receptor pharmacology. The topics incorporated in this course are essential to understanding how drugs are currently developed in the pharmaceutical industry. At the end of the course, students give an oral presentation on a current topic in chemical biology of their choice. **(3); Prerequisites:** PSC311 and CHE211 or permission of the instructor

PSC 757 G *Quantitative Drug Design***.** The principles of subcellular pharmacokinetics are combined with the methods for estimation of drug-receptor binding energies for known and unknown receptors to provide a comprehensive quantitative approach to the construction of structure-activity relationships. The emphasis is placed on understanding the principles of quantitative descriptions of absorption, distribution, metabolism and excretion and drug-receptor binding in terms of drug structure and properties. The methods for prediction of the physicochemical properties of drugs, which are important in drug development, are analyzed in detail. **(3); Prerequisite**: Permission of the instructor

PSC 758 G *Molecular Modeling*. In this course, students will gain hands-on experience with the molecular modeling software that is used in pharmaceutical industry. The following operations with protein structures will be learned: adding missing hydrogens to X-ray structures, assigning proper charges to amino acid residues, neutralizing the charges and preparing the structures for drug docking. The gained skills will include sketching molecular structures, docking them into macromolecular targets and performing simple binding energy predictions. **(3); Prerequisite**: Permission of the instructor

PSC 760 G *Macromolecular Structure*. This course will cover the fundamentals of macromolecular structure from the biochemistry of amino acids to protein motifs and folds, quaternary structure, post-translational modifications and protein-protein interactions. We will cover techniques available to gather information on protein structure (NMR, circular dichroism and X-ray crystallography) and methods used to investigate the interaction of proteins with other molecules (tryptophan fluorescence, isothermal titration calorimetry, NMR). This course will familiarize students with available proteomics tools including BLAST, Pymol, PDB and Expasy and will provide students with the tools necessary to make connections between the structure and function, and deduce information about uncharacterized proteins. **(3); Prerequisite**: Permission of the instructor

PSC 761 G *Thesis Research.* This course consists of an independent research project which has been designed by the student, in consultation with the thesis advisor. The thesis advisor and thesis committee will be selected. The student will then develop a thesis proposal which will be approved by the thesis committee. Once the work described in the thesis proposal has been completed, the student will write and defend the thesis. It is anticipated that the thesis research will be completed over 2-3 semesters. **(1-8)**

PSC 771 G *Industrial Internship.* Students will learn practical aspects of one or multiple fields of the pharmaceutical sciences in an industry setting. They will have opportunity to further develop technical skills while applying theoretical and course-learned background. Drug synthesis, study of mechanisms of action of drugs, formulation and pre-formulation, pharmacokinetics, quality control and regulatory affairs are examples of specific fields in which students may gain experience through this internship. **(3-6); Prerequisites:** PSC 631 and permission of the advisor

PSC 750 G (formerly PSC 861) *Capstone.* The capstone writing project is run as an independent study course. Students will select a topic in conjunction with the faculty instructor and prepare a written review of the existing scientific literature that is relevant to the chosen topic. The review should focus on a particular scientific problem that is actively being investigated and should define and discuss the scope of the problem,

the alternative approaches that are being taken to address the problem, the substantive findings that have resulted from these approaches, and how these findings have shaped the current state of knowledge of the problem. **(3); Prerequisite:** permission of the instructor

PSC 755G *Systems Biology in Drug Discovery.* This course will provide a comprehensive overview of current approaches used for global-scale transcriptomic, proteomic and metabolomic analyses with focus on applications in drug discovery and development. Topics such as mass spectrometry-based biomolecular structure analysis, biomolecule separation/fractionation techniques, chemical and metabolic labeling approaches for quantitative analysis, and bioinformatic tools for interpretation of "omic" data sets will be covered. The goal of the course is to provide the student with the foundation necessary to understand the technical details of omics-based experimental design as well as to analyze and interpret large-scale data sets for a variety of drug discovery and development applications. **(3); Prerequisite**: PSC 311

PSL 331 *Pharmacy Skills I***.** The Pharmacy Skills Courses prepare Doctor of Pharmacy students to provide pharmaceutical care by encouraging students to practice skills used in the process of medication preparation, delivery and patient monitoring. This series of six required courses is designed to instill values, attitudes and skills that enable lifelong intellectual, personal and professional growth. Students will exercise critical thinking, communication, self-learning abilities, responsible use of ethics, and social interaction. The courses are designed as a progressive sequence as students continue to build on concepts throughout the series. ***The minimum passing grade for all Pharmacy Skills courses is 70%.*** In Skills I the focus of the course is on pharmaceutical calculations, extemporaneous compounding of common dosage forms and basics of patient communication. Students will become familiar with USP Chapter 795 requirements and will learn to accurately prepare compounded preparations. The laboratory component allows practice of these principals and skills. Skills I concentrates on preparing the student to practice as a community pharmacy intern. This series of courses is offered by the Department of Pharmacy Practice, and faculty who facilitate discussions and demonstrations are licensed pharmacists that have practiced in a variety of health-care settings. **(2); Prerequisite:** *Doctor of Pharmacy Students only*

PSL 332 ***Pharmacy Skills II:*** The focus of this course is on professional communication with patients and other healthcare professionals, medication dispensing, patient counseling, and extemporaneous compounding of capsules, suppositories and PLO gels. Students will learn fundamental federal and state law related to community pharmacy. The laboratory component allows practice of these principals and skills at the benchtop, in the mock pharmacy and in the private counseling rooms interacting with standardized patients. Skills II completes the students' preparation to practice as a community pharmacy intern. The minimum passing grade for this course is 70%. This series of courses is offered by the Department of Pharmacy Practice, and faculty who facilitate discussions and demonstrations are licensed pharmacists that have practiced in a variety of health-care settings. (2); Prerequisite: PSL 331

PSL 431 *Pharmacy Skills III.* In Skills III, previous concepts are reinforced and the focus of this course is the compounding of sterile preparations. Students will become familiar with compounded sterile preparation and administration, calculations, IV equipment and the requirements of USP Chapter 797 and 800. The laboratory component allows practice of these principals and skills. Skills III concentrates on preparing the student to practice as an institutional pharmacy intern. The minimum passing grade for this course is **70%.** This series of courses is offered by the Department of Pharmacy Practice, and faculty who facilitate discussions and demonstrations are licensed pharmacists that have practiced in a variety of health-care settings. **(2); Prerequisites:** PSL 331, PSL 332

PSL 432 *Pharmacy Skills IV***.** In Skills IV previous concepts are reinforced and the focus of this course is on inter-professional and patient communication, practical calculations, and discharge counseling. Students will

become familiar with medication preparation and distribution, formulary management, documentation, error prevention techniques and technology commonly seen in institutional settings. The laboratory component allows practice of these principals and skills. Skills IV completes the students' preparation to practice as an institutional pharmacy intern. The minimum passing grade for this course is **70%.** This series of courses is offered by the Department of Pharmacy Practice, and faculty who facilitate discussions and demonstrations are licensed pharmacists that have practiced in a variety of health-care settings. **(2); Prerequisites:** PSL 331, PSL 332, PSL 431

PSL 531 *Pharmacy Skills V*. In Skills V, previous concepts are reinforced and the focus of this course centers on advanced patient care. Students will learn how to conduct a chief complaint focused history, perform targeted organ system-specific physical examinations, triage patients to the appropriate level of care, and develop appropriate treatment plans for commonly encountered disease states. Students will also become familiar with home diagnostic and monitoring devices. The laboratory component allows practice of principals and skills learned in lecture and integrates cumulative therapeutics knowledge through formative and summative, simulated patient assessments. Skills V concentrates on preparing the student for APPE rotations. Students will also complete the APhA Pharmacy-Based Immunization Delivery certificate training program. This program is designed to educate students about the professional opportunities for vaccine advocacy and administration. The purpose of this certificate training program is to prepare students with comprehensive knowledge, skills, and resources necessary to provide immunization services to patients across the life span. The completion of this course will result in a certificate that satisfies the legal requirements for the training needed for pharmacists to immunize in all 50 states. The minimum passing grade for this course is **70%.** This series of courses is offered by the Department of Pharmacy Practice, and faculty who facilitate discussions and demonstrations are licensed pharmacists that have practiced in a variety of health-care settings. **(2); Prerequisites:** PSL 331, PSL 332, PSL 431, PSL 432

PSL 532 *Pharmacy Skills VI.* Skills VI is the capstone course that brings together all of the previous knowledge and skills from the Pharmacy Skills sequence. The focus of this course is for students to demonstrate competency as they integrate and apply previously learned knowledge, skills and abilities to identify, document, and / or solve individual patient's drug-related and medical problems. Assignments will be a review of calculations and compounding and support the work identifying and resolving patient related problems as well as supporting the general focus of improving pharmacist decision making processes. PS VI completes the students' preparation for APPE rotations. The minimum passing grade for this course is **70%.** This series of courses is offered by the Department of Pharmacy Practice, and faculty who facilitate discussions and demonstrations are licensed pharmacists that have practiced in a variety of health-care settings. **(1); Prerequisites:** PSL 331, PSL 332, PSL 431, PSL 432, PSL 531

PSY 101 *General Psychology (formerly LAS 221).* This survey of basic concepts in psychology acquaints students with the principles of behavior underlying motivation, learning, personality development and normal and abnormal adaptive processes, as well as with experimental and applied approaches to the understanding and modification of behavior. The course emphasizes current concepts regarding factors that influence overall human adjustment. **(3)**

PSY 140 *Mind and Morality (formerly LAS 142)*. This course explores how psychology helps us to understand what moral reasoning and behavior are all about. Can psychology explain significant aspects of human life? To answer this question, the course will examine "morality" as an expression of human social existence, "moral philosophy" as a justification for moral beliefs and principles, and "the mind" as the primary context of moral reflection and argument. In the end, psychology and ethics will be brought together. **(3)**

PSY 181 *Human Development (formerly BIO 181).* This course traces human development chronologically from conception to late life. At each major life stage, the changes a person experiences on the biological,

psychological (cognitive and emotional), and social levels will be explored, as well as the unique problems and issues that affect people in that stage of life. End of life issues and bereavement will also be covered at the end of the course. **(3)**

PSY 210 *Abnormal Psychology (formerly LAS 226).* This course explores psychopathology from several different theoretical perspectives, including behavioral, cognitive, psychodynamic and biological. Diagnostic classification, etiological theories and treatment approaches to psychopathology will be reviewed. Special emphasis will be given to a multi-cultural analysis and to incorporation of the current DSM diagnostic system. **(3); Prerequisite:** PSY 101

PSY 215 *Becoming Human (formerly LAS 324).* This course explores central aspects of being human. Students examine masculine and feminine identity and their roles in the world as worker, doer, healer and quester. The purpose of the course is to deepen awareness of what it means to become fully human. Readings are drawn from philosophy, psychology and literature. **(3); Prerequisite:** PSY 101

PSY 321 *Health Psychology.* Building upon basic psychological principles learned in General Psychology, this course introduces the field of health psychology by examining the mental, emotional, social, and behavioral factors that affect the onset, recovery, and prevention of physical illnesses. The role of health services and patient-provider relations in health promotion and disease will also be examined. **(3); Prerequisite:** PSY 101

PSY 440 *Death and Dying*. This multidisciplinary course discusses empirically-based concepts related to death and dying. Topics covered include: cultural and historical differences in concepts of death, dying, grief, and bereavement; individual differences related to preparation, adjustment and coping; the impact of the circumstances of death on the bereaved; and death in the modern era (i.e., hospice and palliative care, physician-assisted suicide, media coverage of mass death, etc). Students are challenged to examine their own personal attitudes toward the issues discussed, including but not limited to psychological, medical, legal, ethical, religious, and cultural aspects of death, dying, grief, and bereavement. This course incorporates informational lectures, class discussions, small group activities, and individual projects designed to aid students in personally relating to the material. **(3); Prerequisites**: PSY 101, Junior or Senior Level Status/P1 or above

~~**PTP 401** *Principles of Pharmacology and Medicinal Chemistry (formerly BIO 411).* This introductory course is required for all PharmD and an elective for BS Pharmaceutical Sciences students. The course reviews the basic core principles of parmacology/medicinal chemistry, setting the stage for subsequent integrated Pharmacology/ Therapeutics modules which cover specific diseases along with relevant drug classes. Receptors and receptor binding, dose response curves, pharmacokinetics (absorption, distribution, and elimination of drugs), pharmacodynamics (drug concentration and effect), biotransformation of drugs, pharmacogenomics and factors affecting drug action will be discussed. **(2); Prerequisites:** PSC 311, PSC 312, PSC 321 and PSC 322~~

PTP 410 *PTPM Respiratory* **-** PTPM2 is a 1-credit course focused on respiratory disorders. This is one in a series of 11 courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/Pathophysiology I & II and Principles of Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (e.g. respiratory disorders conditions are the focus of this course). Taught by both basic-science and clinical faculty, course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics of respiratory disorders. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-

solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. **(1);** **Prerequisites:** ~~PTP 401~~PSC 369, PHM 329

PTP 425 *PTPM Endocrine* - is a 2-credit course focused on the endocrine system. This is the sixth in a series of eleven courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/Pathophysiology I & II and Principles of Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (e.g. endocrine diseases are the focus of this course). Taught by basic-science and clinical faculty, course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics of endocrinology disorders. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice.
Prerequisites: ~~PTP 401~~PSC 369, PSC 370

PTP 431 *PTPM GI/Nutrition* **–** PTPM 4 is a 2-credit course focused on the gastrointestinal (GI) system. This one in a series of 11 courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/Pathophysiology I & II and Principles of Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (e.g. GI conditions are the focus of this course). Taught by both basic-science and clinical faculty, course content is integrated to promote an analytical understanding of fundamental drug, nutritional and disease concepts as well as practice-based therapeutics of GI disorders. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. **(2)**; **Prerequisites:** ~~PTP 401~~PSC 369, 370; PHM 329

PTP 440 *PTPM Cardiovascular* – PTPM Cardiovascular is a 4-credit course focused on the cardiovascular system. This course is part of the PTPM series that examines therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/ Patho-physiology I & II and Molecular Foundation of Drug Action I, courses in this series are organized by therapeutic area (e.g. cardiovascular conditions are the focus of this course). Taught by both pharmaceutical and clinical faculty, course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics of cardiovascular disorders. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. (4); Prerequisites: PHM 329, PSC321, PSC322, and PSC369

PTP 446 *PTPM Infectious Disease* – PTPM5 is a 4-credit course focused on the treatment of infectious diseases. This is part of a series of courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/ Pathophysiology I & II and Principles of Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (e.g. Infectious diseases are the focus of this course). Taught by both basic-science and clinical faculty, course content is integrated to promote an analytical understanding of fundamental drug effects and disease concepts as well as practice-based therapeutics of infectious diseases. Emphasis is placed on evidence-based selection of rational

therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. **(4); Prerequisites:** ~~PTP 401~~PSC 369, PSC 370; PHM 329

PTP 515 *PTPM RheumatologyOncology*. PTPM Rheum/Onc is focused on the therapeutic approach to rheumatic, hematologic and oncologic disease states. This is one in a series of modules that examine therapeutic management of clinical disease states in an interdisciplinary approach taught by both pharmaceutical science and pharmacy practice faculty, while building upon previous courses such as Immunology, Physiology/Pathophysiology I&II, Introduction to Pharmacology and Medicinal Chemistry. Course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics of rheumatic, hematologic and oncologic disorders. Using both a lecture and patient case-based format, this module will emphasize evidence based selection of therapeutic and supportive care management, patient-centered pharmaceutical care based recommendations, and managing complex disease states and patients. In addition, this module will expand on students' patient assessment skills, patient outcome monitoring, documentation of patient centered care plans and patient counseling. Skill development in this course will prepare students for integrated problem solving workshops, experiential education, and pharmacy practice. **(3); Prerequisites:** ~~PTP 401~~PSC 369, PSC 370, BIO 313, BIO 314

PTP 525 *PTPM Nephrology.* PTPM Nephrology is a 2-credit course focused on the renal system. This is one of a series of courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/Pathophysiology I & II and Introduction to Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (nephrologic conditions are the focus of this course). Taught by both basic science and clinical faculty, course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics of nephrologic disorders. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. **(2); Prerequisites:** ~~PTP 401~~PSC 369, PSC 370, PTP 440, PSC 321, PSC 322

PTP 528 *PTPM Genitourinary.* PTPM3 is a 2-credit course focused on the genitourinary system. This is the eighth in a series of ten courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in Physiology/ Pathophysiology I & II and Principles of Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (e.g. genitourinary conditions are the focus of this course). Taught by clinical faculty (the basic science components of this course will be addressed during the PTPM2 Endo course), course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics of the genitourinary system. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. **(2)**; **Prerequisites:** PSC 369, PSC 370~~PTP 401~~, PSC 321, PSC 322

PTP 549 *PTPM Neuro-Psychiatric Disorders.* PTPM Neuro/Psych is a 4-credit course focusing on neurologic/psychiatric diases . This is the ninth in a series of ten courses that examine therapeutic management of clinical disease states within an interdisciplinary sequence consisting of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy. Building on concepts learned in

Physiology/Pathophysiology I & II and Principles of Pharmacology and Medicinal Chemistry, courses in this series are organized by therapeutic area (e.g. neuro/psych conditions are the focus of this course). Taught by clinical faculty and basic science faculty, course content is integrated to promote an analytical understanding of fundamental drug and disease concepts as well as practice-based therapeutics addressing common neurologic and pyschiatric diseases. Emphasis is placed on evidence-based selection of rational therapeutic goals, recommendations, and outcome monitoring while using an integrated knowledge of drug properties and clinical diseases. General knowledge and skills development in this course will prepare students for problem-solving workshops, other courses in the PTPM series, experiential education, and pharmacy practice. **(4)**; **Prerequisites:** PSC 369, PSC 370~~PTP 401~~, PSC 321, PSC 322

SOC 101 *Sociology.* The ultimate goal of the course is to develop an understanding of the complexity of the world around us and gain new insight into how that social world functions to shape our behavior. By examining the methods, theories and areas of interest to sociologists, students will gain a general understanding of how they, as scientists, analyze the social world. The beginning of the course will (1) explore the assumptions, theories and methods that sociologists use for gaining greater insight into the social world, (2) look at the basic processes that shape the interactions we engage in every day, and (3) make critical application of theories and methodologies to everyday events and interactions. The remainder of the course will be devoted to the discussing and incorporation of major topical areas within sociology using the theoretical underpinnings. **(3)**

SOC 110 *Introduction to Culture and Society (formerly LAS 151).* This course introduces the student to global diversity, theoretical ways of looking at cultural behaviors and understanding one's own ethnocentrism. Through film, ethnographic readings and text books, this course will give the student a broad view of societies of varying levels of complexity, focusing on systems of kinship, gender, economics, politics and religion, among others. **(3)**

SOC 115 *Introduction to Medical Anthropology (formerly LAS 283).* Introduction to Medical Anthropology introduces students to the cultural foundations of illness and curing. The course focuses on non-Western societies and how these societies perceive and treat states of health and disease. The course presents issues of health and disease within a framework of ecological, evolutionary and cultural systems and provides a background in current theoretical perspectives in anthropology. **(3)**

SOC 120 *Introduction to Public Health*. This course will offer an introduction to public health, history of public health and public health education, and a focus on population health/social determinants of personal and community health. There will be an overview of the health care delivery system, the necessary human resources, and other public health topics will be addressed. **(3)**

SOC 140 *Family Violence (formerly LAS 204).* This course is designed to provide the student with varied perspectives on family violence including historical, legal, cultural and political views, to familiarize the student with current trends and issues in partner (relationship) abuse, elder abuse, physical child abuse and child sexual abuse, to inform the student about current research on the nature and dynamics of family violence and to increase the student's understanding of the criminal justice, mental health, health care and social service responses to the victims, offenders and family members who are impacted by violence in the family. **(3)**

SOC 145 *Race and Ethnicity in America (formerly LAS 274).* This course seeks to examine, describe, and explain the conditions and issues that surround a number of racial and minority groups in contemporary America. A variety of theoretical, historical, and topical concerns will be addressed during the course including an introduction to sociological study of racial and ethnic inequality in the United States. Emphasis will be placed on understanding the social, economic, political, historical, and demographic forces that have shaped the experiences of different racial and ethnic groups in the United States. This course will also address the

processes that gave rise to race and ethnicity as important forces in the United States and the sociological perspectives that govern the understanding of these forces. **(3)**

SOC 210 *Aging and Society.* This course will provide an introduction to the sociology of aging using the life course perspective. Examining various theoretical frameworks and perspectives will help students to explore a variety of issues related to an aging population. We will explore the demographic, social and health aspects of aging from both a macro-level and the individual experiences of an aging population. In addition we will review organizational, community, and public policy responses to an aging population. **(3); Prerequisite:** HUM 102

SOC 290 *Undergraduate Research.* This course provides an opportunity for students to obtain a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. SOC 290 is generally reserved for introductory level experiences and/or smaller scale projects. Students are expected to perform three hours of research related work per credit hour earned. **(1-3); Prerequisite:** permission of the instructor

SOC 301 *Research Methods for the Social Sciences.* This course provides students with exposure to a variety of research methods in the behavioral and social sciences. It will focus on the research process from crafting a research question to gathering data and analyzing the results through both quantitative and qualitative techniques. The course will emphasize applied research methods and we will develop skills in understanding and interpreting data. At the end of the course, students will have had exposure to a broad range of data collection methods as applied to a variety of health issues and problems. **(3);** Corequisite: ETH 320

SOC 310 *Evolution of Society and Human Health (formerly LAS 912).* This course is designed to educate students about the relationship between society, culture and human biology through examination of the history of human health as it has been influenced by urbanization. The course begins with the earliest human societies and traces the history of human health in hunting/gathering societies, agricultural societies, medieval cities, industrial cities and cities today. Approximately half the course focuses on health in modern cities and developed nations. **(3); Prerequisite:** HUM 201

SOC 315 *Social Aspects of Health Care (formerly PAD 333).* This course educates students about the relationship between human health and society, economics, politics, ideology and biology through examination of the history of human health policy and contemporary issues. **(3); Prerequisite:** HUM 201

SOC 325 *Medical Sociology.* The purpose of this course is to provide an overview of the general field of medical sociology. Research and analysis of the medical environment from a sociological perspective will be explored. The course will focus on the major concerns of medical sociology: social facets of health and illness, the social functions of health institutions and organizations, the relationship of systems of health care delivery to other social systems, and the social behavior of health personnel and consumers of health care services. By examining the methods, theories, and research studies within the field of medical sociology, students will be begin to appreciate and understand the role of social and cultural factors in health, research on the use of health services, the health professions, health-care organizations, and major issues in public policy and health care. **(3)**

SOC 330 *Culture of Disability.* This course will address psychological, sociological and cultural perspectives on disability. Sociological and cultural perspectives focus on the social construction of disability, the policy, legal and medical aspects of living with a disability, as well as specific populations and how they experience disability. The course focuses on experiences and depictions of disability in the past, present and looks to the future, specifically in terms of the role of technology in the disability community. What does it mean to be "disabled"? What impacts a person's experience of disability? How is the health care experience different or

the same for a person with a disabilty than a non-disabled person (e.g., communication challenges, living arrangements, role of a caregiver/health care proxy)? **(3); Prerequisite:** SOC 101

SOC 335 *Global Health*. In Global Health students study health in the world's least economically developed countries (LDCs) by examining how narrative, gender, culture, the environment, and economics affect health and health outcomes. This course facilitates a global perspective that helps students both to engage with the complexities of health in the world's LDCs and to improve overall cultural competency. **(3); Prerequisite**: COM 115, HUM 201 or permission of the instructor

SOC 350 *Disparities and Social Justice*. This course, generally, will take two approaches to understanding social identities as related to health and healthcare services. First, social identities (e.g., race, class, gender, sexuality, disability) and the related power structures (e.g., oppression, privilege, racism, sexism, homophobia) are theorized. Then, students apply this knowledge to cultivate a richer understanding of healthcare disparities. Finally, the course moves towards creative correctives in healthcare advocacy, research in medicine and public health, and development of just and equitable healthcare policy that is informed by the background of these complex, often harmful, social forces. This complicated work integrates methods and research from multiple disciplines (e.g., humanities, feminist and critical race theory, social sciences, public health, disability studies, and biomedical sciences), and from Western and non-Western sources. This presents ethical issues relative to different methods of measuring health inequalities and related policies. **(3); Prerequisite**: SOC 101

SOC 420 *Health and Social Policy*. This course presents an introduction to health policy, i.e., the various ways in which the government plays a role in health and in the provision of health care. Health policies can impact quality of life in terms of accessibility, cost, quality of health care; safety of food, water, and environment; and the right to make decisions about our health. These issues are tied to health policies. **(3); Prerequisite**: SOC 101

SOC 480 *Undergraduate Field Experience.* The undergraduate field experience is designed to enable Health and Human Sciences students to gain valuable skills and experience in a variety of public health settings. Working in a voluntary capacity, you are able to select a site that provides an opportunity to gain insight and knowledge regarding your career interests and goals. Through this course students will gain valuable professional experience. Internships are obtained by the students with consultation from ACPHS faculty and staff. **(1-9); Prerequisite**: permission of the instructor

SOC 490 *Undergraduate Research.* This course provides an opportunity for students to obtain a hands-on research experience under the guidance of a faculty member. The number of credit hours and scope of the project undertaken are at the discretion of the faculty member involved. SOC 490 is generally reserved for more advanced research projects of students with prior research experience. Students are expected to perform three hours of research related work per credit hour earned. Faculty members may expect students to present their research in venues either internal or external to the college. **(1-3); Prerequisite:** permission of the instructor

UGC MBA 510 *Financial Accounting.* An introduction to the generally accepted accounting principles of financial accounting as applied to publicly reported financial statements. Emphasis is to be placed on understanding the application of "generally accepted accounting principles" to financial statements. This course is designed for individuals with no prior academic or professional education on the topic of financial accounting. **[Union Graduate College]**

UGC MBA 512 *Managerial Accounting and Finance.* An introduction to the tools and techniques of financial analysis and decision-making. Topics covered include financial statement analysis, cost classification and behavior, cost-volume-profit analysis, incremental cost analysis, time value of money, capital budgeting, and

financial planning. Spreadsheet programs are used in this course. Prerequisite: Financial Accounting UGC MBA 510. Students are expected to be proficient in the use of Microsoft Excel®. **[Union Graduate College]**

UGC MBA 635 *Project Management.* A project is a one-time or infrequently occurring operation with a unique goal, a limited lifespan, and limited resources. This course will focus on the basic components of project management, including statements of work, project selection, leadership and team building, communication, budgeting, resource scheduling, metrics and closure. Students will have the opportunity to develop a project plan of their own choosing using MS Project as well as explore current issues in project management through case discussions. **[Union Graduate College]**

Updated for Spring 2019

STUDENT SUPPORT SERVICES

Student Support Services works to inspire confidence, increase student competence, and create self-reflective learners in a friendly, welcoming environment. Our comprehensive programs are designed to help students grow academically, personally, and professionally.

Through the development of independent learning skills, our services help students develop a deeper understanding of classroom concepts, reinforce integration of ideas between courses, and ultimately improve their chances of academic success.

OUR SERVICES

Peer Tutoring
A peer-to-peer tutoring service supporting core science and math courses.

Peer Mentoring
Upperclass students are matched with incoming students to ease their transitions to ACPHS.

Science Assistance Center
A professional tutoring center dedicated to the math and science courses in the first two undergraduate years.

Writing Center
Staffed by professional and peer tutors, the Writing Center is a free, one-to-one service available to all members of the ACPHS community.

Academic and Study Skills Workshops and Consultations
For students seeking to better understand and strengthen their strategies for academic success.

INFORMATION FOR STUDENTS

What if I've tried everything I can think of to study better, and it's just not paying off?

Many of us take for granted our ability to learn until we're put in new and challenging environments. If you've tried everything you can think of, or if learning has become a chore or struggle, it may be time to take a fresh, objective view of your study habits and strengths.

An appointment with Student Support Services can provide you with just such an objective view, as well as give you helpful hints and suggestions for improving your habits.

Emergency Contacts Albany Campus

University Heights Association Public Safety (UHA Public Safety) provides public safety services on the ACPHS campus as well as the neighboring campuses of Albany Law School and the Sage College of Albany. This service is seven days a week, 24 hours a day, 365 days a year.

The UHA Office of Public Safety is located at the Sage College of Albany Armory, located at 130 New Scotland Avenue, Rooms 111-116. The entrance to the Public Safety Offices are on the east side of the Armory (the side closest to the O'Brien Building).

In the event of an emergency, public safety can be reached at **518-244-3177**, or you may dial local safety and support services as appropriate.

UHA Public Safety consists of uniformed patrol officers and supervisors who work to ensure a safe community, but who do not have law enforcement powers. These officers use foot patrol, bicycle, and vehicular patrol.

Upon appointment, officers are required to be licensed as security guards through the New York State Department of State. Officers are required to complete the New York State Security Guard Training Program. UHA officers also receive annual CPR-AED training and undertake special topics training related to campus safety.

College-operated and managed residence halls are staffed by Resident Life professionals and student assistants. The perimeter doors in all residence halls are locked 24 hours a day and access may be gained through use of access cards that are distributed to resident students. All students also receive a room key for their individual rooms and suites (if applicable). Security for residence halls and their designated parking areas is provided by UHA Public Safety.

UHA Public Safety can be reached by picking up a red phone in Residence Halls or activating a Blue Light anywhere on the ACPHS campus or one of the neighboring campuses. The Blue Light system rings directly to the UHA dispatch office. Monitoring of safety and fire alarms is provided through Stanley Security.

Any criminal or suspected activity on the ACPHS campus should be reported to UHA Public Safety or the City of Albany Police Department. The College will assist local law enforcement agencies in the investigation of any criminal activity on campus.

- Fire and Emergency Services: 9-1-1
- Campus Safety (emergency): 518-244-3177
- Capital District Psychiatric Center: 518-447-9650
- Office of Counseling Services: 518-694-7107
- Office of Residence Life: 518-694-7155
- ACPHS Main Number 518-694-7200

Emergency Contacts Vermont Campus

Public Safety services for the ACPHS Vermont Campus are coordinated by University Heights Association's Office of Public Safety (in Albany) and provided on site by the Hunter North Associates.

In an emergency, Public Safety may be reached at **518-244-3177**.

Hunter North Associates provides uniformed security personnel on the following schedule:

- Monday Thursday - 2:00 pm to 10:00 pm
- Friday - 2:00 pm to 6:00 pm
- Saturday - Noon to 6:00 pm
- Sunday - Noon to 10:00 pm

Services provided by Hunter North Associates include: preventative patrol by foot; emergency response; crisis management; law enforcement; incident reporting and Clery Act reporting; investigations; medical emergency response; traffic control and parking enforcement; crime prevention awareness and training; and liaison with public safety agencies.

Public Safety officers are security guards licensed by the State of Vermont. They are trained to the standards and requirements set by the Vermont Office of Professional Regulation, Board of Private Investigative and Security Services.

The security staff are assisted by technologies that are intended to enhance the safety and security of students, faculty, and staff across all of the campuses. Technologies include:

Closed circuit television systems which place cameras at a number of locations, both inside and outside, around campus. The cameras are monitored in the University Heights Association's Office of Public Safety dispatch center, as well as by Hunter North Associates during their coverage. Security cameras are recorded for investigatory and evidentiary purposes.

Key Fob access to exterior doors of all academic buildings, which notifies University Heights Association's Office of Public Safety when doors are opened outside of normal business hours or when they are propped open.

Hunter North Associates
(On-campus Public Safety Officer)
603-494-4617

Public Safety Emergency
518-244-3177

Colchester Police/Fire/Rescue
802-264-5555

Offices and Departments

If you can't find the person/department you are looking for on the list below, you may want to view the employee directory.

Admissions – admissions@acphs.edu / 518-694-7221

Bookstore - bob.kern@acphs.edu / 518-694-7378

Continuing Education - lori.kline@acphs.edu / 518-694-7231

Financial Aid - financial_aid@acphs.edu / 518-694-7256

Graduate Studies - graduate@acphs.edu / 518-694-7101

Human Resources – employment@acphs.edu / 518-694-7370

Institutional Advancement – alumni@acphs.edu / 518-694-7393

Library - library@acphs.edu / 518-694-7270

Public Safety - 518-244-3177

PR/Media – gil.chorbajian@acphs.edu / 518-694-7394

Registrar - registrar@acphs.edu / 518-694-7222

Research – karry.laforest@acphs.edu / 518-694-7575

Student Affairs - AnnMarie.Isgro@acphs.edu / 518-694-7307

Vermont Campus – carolyn.claxton@acphs.edu / 802-735-2601