ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES

2021-22 COLLEGE CATALOG

DISCLAIMER

All information in this Catalog pertains to the 2021-2022 academic year and is correct to the extent that the information was available (by August 2021).

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.

Please visit https://www.acphs.edu/academics/catalog for the most up-to-date program information.

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.

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, two student-operated pharmacies and the Collaboratory are part of what distinguishes ACPHS from other colleges and universities.

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.

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. 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 institution is accredited through 2029.

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 2025.

CLINICAL LABORATORY SCIENCES

The College's Clinical Laboratory Sciences programs hold accreditation from the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), 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 2029.

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 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.

PUBLIC HEALTH

The College's Public Health Program holds accreditation from the Council on Education for Public Health (CEPH), located at 1010 Wayne Avenue, Suite 220, Silver Spring, MD 20910. Their telephone number is (202) 789-1050. The program is accredited through 2026.

2021-22 ACADEMIC CALENDAR

FALL 2021 SEMESTER

August 18 - New Student Move In Day
August 18-22 - New Student Orientation
August 23 - First Day of Classes

September 6 - Labor Day

October 11 - Indigenous People Day
October 12 - Classes Resume (Monday Schedule)

November 24-26 - Thanksgiving Break

December 6-10 - Final Exams
December 11 - Emergency/Make-Up Day
December 13-January 7 - Winter Break

SPRING 2022

January 10 - First Day of Classes
January 17 - Martin Luther King Day

February 21- President's Day
February 22 - Classes Resume (Monday Schedule)

March 7-11 - Spring Break

April 27 - Reading Day
April 28-May 4 - Final Exams

May 14 - Commencement

FERPA

ACPHS maintains a strict adherence to the Family Educational Rights and Privacy Act of 1974 (FERPA) regulations posted on the College's website and distributed to students at the beginning of each semester and whenever a change in policy occurs. The adherence applies to both students enrolled in classes on the campus and those taking classes at a distance. FERPA affords students the following rights with respect to their education records:

(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 Foundations 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:

- name and campus e-mail address
- city, town or village and state or country of residence
- class, anticipated date of graduation, major field of study, including the college, division, department, or program in which the student is enrolled
- participation in officially recognized activities and sports
- weight and height of members of athletic teams
- the most recent educational institution attended and previous educational institutions attended and dates of graduation therefrom
- honors and awards received, including selection to a Dean’s list or honorary organization,

- photographic, video or electronic images of students taken and maintained by ACPHS
- marital status and spouse's name
- 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

TUITION AND FEES

Below are the 2021-22 **college 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]	$36,840
Professional Pharmacy Program, P1-P4 [2]	$42,620
Accelerated Pharmacy [9]	$33,270
Graduate (M.S.) Programs [3]	$1,420/credit hour

STUDENT HOUSING

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[4]	$4,600
Student Health Insurance Fee [5]	$2,229
International Student Fee	$200
Activity Fee - Full Time Students [6,7]	$0
Activity Fee - Part Time Students [6,7]	$0
Orientation Fee - First Year Students [6,7]	$350
Orientation Fee - Transfer 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	$280
Albany Resident (9 month)	$360
6th Year Single Rotation (on campus)	$60

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 $1,230 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 3-6 for students. The P1-P4 tuition is charged at a rate of $1,420 per credit hour on a part-time basis (11 credit hours or less). The full-time (12 credits or more) tuition charge is $21,310 per semester. The fee for auditing is the same as that charged for part-time coursework.
3. Tuition is charged at a rate of $1,420 per credit hour for graduate courses. The maximum total per semester is $21,310 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 $4,600 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.
9. The Accelerated Pharmacy tuition is charged at a rate of $33,270 for the 2021-2022 academic year. (Summer 2021, $10,910 and Fall 2021, $22,360). The Spring, 2022 semester tuition charge is estimated to be $22,360.

IMMUNIZATIONS

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)

IMMUNIZATIONS

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.

IMMUNIZATIONS

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.

IMMUNIZATIONS

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.

IMMUNIZATIONS

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.

IMMUNIZATIONS

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 immediately prior to starting IPPE rotations through the start of APPE rotations. 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.

IMMUNIZATIONS

RECEIVING VACCINATIONS

It is the obligation of the student to complete required immunizations/proof of immunity prior to starting classes. Due to insurance regulations, students should go through their primary care physician to do so, if possible.

Please note that Albany College of Pharmacy and Health Sciences does not administer immunizations, blood tests or titers.

For further information and questions regarding immunization requirements, please contact the Office of Experiential Education at 518-694-7277, Room 108A, O'Brien Building, Albany Campus.

ADDITIONAL ROTATION REQUIREMENTS

Some rotation sites have additional requirements that must be documented prior to starting that specific rotation (e.g. antibody titer as opposed to proof of vaccination; drug screen; background check). These additional requirements would be documented in the CoreELMS database system (for pharmacy students), as well as communicated to the student in advance by Experiential Education staff.

It is the student's responsibility to ensure the requirements are met prior to commencement of the rotation and will also be at the student's expense (except when facilitated by the rotation site.) If the additional requirements are not met prior to start of their experience, the student will not be allowed to begin the rotation until they have been fulfilled. Failure to provide sufficient documentation prior to rotations puts a student at risk for being removed from rotation. If a student is removed for this reason, he/she will be rescheduled for a later rotation and placed at any available rotation site (not necessarily the choice of the student). This reschedule will incur a $250 fee, which is at the student's expense.

HIPAA, BLOODBORNE PATHOGENS and INFO SECURITY TRAININGS

Students participating in experiential education leading to a career as a pharmacist must complete a **Health Privacy (HIPAA)**, an **OSHA Bloodborne Pathogens** and an **Info Security** training during their P1 year as a component of the Foundations of Pharmacy course, and annually thereafter. Students will complete the online trainings through The Collaborative Institutional Training Initiative (CITI Program), and is provided free of charge to students. If a student does not complete one of the above requirements initially (during the Foundations of Pharmacy course), they will not receive their assignments for IPPE rotations; in successive years, if the trainings are not completed by the deadline set, students will not be allowed to start their rotations.

CPR OR BASIC LIFE SUPPORT CERTIFICATION

All pharmacy students are required to obtain CPR (Cardiopulmonary Resuscitation) or BLS (Basic Life Support) certification before starting clinical rotations. Students must have valid CPR or BLS certification before they begin their IPPE rotations and will be required to keep their certification valid throughout the duration of their APPE rotations. All certifications MUST include a hands-on skills portion (training cannot be done online only.)

IMMUNIZATIONS

NON-ACADEMIC REQUIREMENTS FOR IPPES AND APPES

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

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 is on file at the College (in the event a site requests to see them).
- Proof of a recent physical exam, 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.)
- 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 screening must be 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.)
- CPR or Basic Life Support Certification, valid for the duration of all rotations
- Seasonal influenza (flu) vaccination

Some clinical sites may have their own requirements as well, including a criminal background check, a drug screen or 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.

GENERAL ABILITY OUTCOMES

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.

GENERAL ABILITY OUTCOMES

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.

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 Students First Fund, participating in the Alumni-Student Mentoring Program and career networking events, and promoting the importance of future alumni involvement.

For more information about the Alumni Council contact the Office of Institutional Advancement at (518) 694-7393 or alumnicouncil@acphs.edu.

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 applicants)

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). Students applying for a joint-degree program should apply no later than December 1. The College 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 following materials also must be sent to the Office of Admissions:

- Official high school transcript(s) from all secondary schools attended, including the 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). Note that due to the impacts of COVID-19, standardized tests are not required through the 2021-2022 application year.
- Official reports from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS), or DuoLingo if the applicant has studied for fewer than four years where English is the language of instruction. A minimum score of 84 on the TOEFL, a minimum of 6.5 on the IELTS, or a 110 on DuoLingo must be achieved to be considered for admission.
- One (1) letter of recommendation from a school official, such as a counselor or a teacher, is required. An additional recommendation from a science or math teacher or from an individual that knows the candidate well is preferred.

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 may 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.

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/4 units. Coursework must include logarithms and exponentials. Coursework may include precalculus, statistics, business math, finance, an extended course sequence of algebra/geometry/trigonometry, or other math electives taken during a student's senior year.
- 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 $100, 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 waitlist 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 five or higher. 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 the 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 to 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. Approximately 96 percent of current students have received some assistance. Total assistance for 2020-21 Grants and Scholarships- $15,064004; Loans – $25,072,537.

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 https://studentaid.ed.gov/sa/fafsa as early as October 1. 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 at https://studentaid.ed.gov/sa/fafsa.

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

PROCESS FOR PASS/FAIL COURSES, INCOMPLETES, WITHDRAWALS, REPETITIONS, AND TRANSFER OF CREDIT

For the 2019-20 year, courses with grades of P in Pass/Fail courses will be counted in the quantitative standard only. Course incompletes and withdrawals are counted in the quantitative standard only. Repeated courses will be counted in the quantitative standard only. Transfer credits will be counted in the quantitative standard only. 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 to 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 one* qualified person (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 a 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 June 12. 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 educational 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 the 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 2021-22 FAFSA for financial aid during the summer 2021 semester.

- The financial aid award year begins July 1, 2021, for the 2020-21 academic year. Therefore, federal funds for the 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 2021-22 year. Module J will be used for make-up rotations only. Fall 2021 semester includes modules A – E; spring 2022 semester includes modules F – I. Institutional aid will be disbursed after July 1, 2021. Student aid for the spring 2022 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 waitlist 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 2021

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 the required corrections or verification of data reported on the student's federal ISIR. The Office of Financial Aid will evaluate eligibility annually based upon the issuance of final grades for the 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.

Academic Excellence Awards, Panther Pride Awards, 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 ACADEMIC EXCELLENCE AWARD

ACPHS offers tuition scholarships to qualified entering freshmen upon admission to the College based upon superior academic achievement in high school. The Academic Excellence Award is renewed each year provided the student maintains a cumulative overall GPA of 3.0 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 PANTHER PRIDE AWARD

ACPHS offers limited scholarships to qualified entering freshmen based on FAFSA results and academic performance. The Panther Pride Award is renewed each year provided the student maintains a cumulative overall GPA of 2.8 or better. Students must submit the FAFSA each year to determine eligibility for this grant.

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 ASCEND AWARD

ACPHS offered new undergraduate and professional students enrolling for the 2021-22 year an award to celebrate hard-working students and their ongoing academic success.

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 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 SPECIAL RECOGNITION SCHOLARSHIP FOR UNDERGRADUATE TRANSFER STUDENTS

ACPHS offered tuition scholarships to qualified entering undergraduate transfer students upon admission to the College based upon honorable academic achievement. The Special Recognition 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 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 the continued renewal of this award.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES NEW YORK TRUSTEE SCHOLARSHIP FOR PROFESSIONAL ENTRY DOCTOR OF PHARMACY STUDENTS

ACPHS offers tuition scholarships to qualified entering P1 students to the Albany Campus upon admission to the College based upon superior academic achievement. The New York Trustee Scholarship is renewed for a maximum of 3 semesters during the undergraduate years, provided the student maintains a cumulative overall GPA of 3.0 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 LEGACY SCHOLARSHIPS

ACPHS offers limited scholarships to qualified students 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.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES PRESIDENTIAL SCHOLARSHIP

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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 BIOMEDICAL TECHNOLOGY EXCEL AWARD

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered 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 the 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

Prior to the 2019-20 year, ACPHS offered 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

Prior to the 2019-20 year, ACPHS offered tuition 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

Prior to the 2019-20 year, ACPHS offered tuition scholarships to be awarded to qualifying entering freshmen 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

Prior to the 2019-20 year, 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 the continued renewal of the award.

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES TRUSTEE GRANT

Prior to the 2019-20 year, ACPHS offered tuition scholarships 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.

Updated June 2021

FEDERAL GRANTS & LOANS

FEDERAL GRANTS

FEDERAL PELL GRANTS

Students may apply for the 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 $6,495 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 $1,300 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 BENEFIT GI Bill®

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. An 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

William D. Ford Federal Direct 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) at www.studentloans.gov.

The E-MPN is a 10-year serial promissory note used for all Direct loan borrowing while attending the College. Students will complete the Direct loan E-MPN during the first year of attendance. Annual eligibility for Direct loans will be communicated through the online financial aid system. Students must accept or decline Direct loan funds through that system annually. Transfer students or students with prior loan history will be required to complete a new Direct loan E-MPN in order to borrow loans 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. These paper 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 LOANS

Subsidized loans are 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 LOANS

Eligibility for this loan 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 loans totaling up to the applicable limit if they do not qualify for the total amount permitted under the Federal Direct Loan program.

DIRECT 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's 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 LOAN INTEREST RATES

The interest rate for federal loans varies by the type of loan and the first disbursement date of the loan. Loans made after July 1, 2015, have fixed rates. The following schedule shows the annual changes in the fixed interest rates:

First Disbursed Between	Undergraduate Subsidized Loan Interest Rates	Undergraduate Unsubsidized Loan Interest Rates	Graduate Unsubsidized Loan Interest Rates	Direct PLUS Loan Interest Rates
7/01/21 - 6/30/22	3.73%	3.73%	5.28%	6.28%
7/01/20 - 6/30/21	2.75%	2.75%	4.30%	5.30%
7/01/19 - 6/30/20	4.53%	4.53%	6.08%	7.08%
7/01/18 - 6/30/19	5.05%	5.05%	6.60%	7.60%
7/01/17 - 6/30/18	4.45%	4.45%	6.00%	7.00%
7/01/16 - 6/30/17	3.76%	3.76%	5.31%	6.31%
7/01/15 - 6/30/16	4.29%	4.29%	5.84%	6.84%

FEDERAL DIRECT PLUS AND FEDERAL DIRECT GRADUATE PLUS LOAN INTEREST RATES

The interest rate for Direct PLUS Loans is a fixed rate of 6.28% for those loans first disbursed on or after July 1, 2021, and before July 1, 2022. 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 net amount that you will 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 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 interest rate of the loans being combined. Visit http://www.studentloans.gov for additional information.

FEDERAL DIRECT LOAN REPAYMENT OPTIONS

Visit http://www.studentloans.gov for additional information on the options below.

- 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 an 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 June 2021

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**

NEW YORK STATE TUITION ASSISTANCE PROGRAM (TAP GRANT)

In the 2021-22 year, NYS may provide a tuition award from $500 to $5,165 per year. The state legislature determines the award schedules 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 2019 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 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.

TAP GRANT ELIGIBILITY

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

- Be a United States citizen or eligible noncitizen and a resident of New York State for the past 12 months
- Have graduated from high school in the United States, or earned a high school equivalency diploma
- Study full-time undergraduate (at least 12 credits per semester) at an approved postsecondary institution in New York, be matriculated in an approved program of study, and be in good academic standing with at least a cumulative "C" average as of the 4th-semester payment
- Be charged at least $200 tuition per year
- Not be in default on any state or federal student loans and not be in default on any repayment of State awards
- Meet income requirements
- 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.

PURSUIT OF PROGRAM REQUIREMENT FOR NEW YORK STATE AWARDS

In order to receive New York State awards, a student is required to be in good academic standing. The two measurements that make up good academic standing are the **Pursuit of Program** and **Satisfactory of Academic Progress** (see charts below). The Pursuit of Program requires that the student complete a certain percentage of credits each term. Satisfactory Academic Progress requires that the student earns a specified number of credits and achieves a specified cumulative grade-point average each term.

PURSUIT OF PROGRAM

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

SATISFACTORY ACADEMIC PROGRESS

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 Enhanced Recognition Incentive and Tribute – MERIT Scholarship
- NYS Achievement and Investment in Merit Scholarship (NY-AIMS)
- 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 AWARDS

- NYS Aid to Native Americans
- NYS Regents Awards for Children of Deceased and Disabled Veterans
- Segal AmeriCorps Education Award
- Veterans Tuition Awards
- NYS Science, Technology, Engineering and Mathematics (STEM) Incentive Program

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**.

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INTERNATIONAL ADMISSIONS

Ten percent of ACPHS students are from outside the U.S. which means we understand your needs as an international applicant and will work closely with you to ensure the admissions process goes smoothly.

Should you decide to enroll at the ACPHS, we are here to assist with your transition to the College and a new country. Faculty and staff work closely with international students by hosting special orientation events and leading off-campus field trips.

An application fee of $75 is required for first year, transfer, domestic, and international students. For students who conduct an official visit to the College, an Application Fee Waiver can be requested by contacting the Office of Admissions.

We're thrilled that you are considering Albany College of Pharmacy and Health Sciences for your degree. You can find more information about our outstanding academic programs below.

- Bachelor of Science Programs
- Master of Science Programs
- Doctor of Pharmacy Program

Depending on when you graduated (or will graduate) from high school and if you have any previous college experience, you may be considered a freshmen student or a transfer student. If you have already completed a college degree, you may be interested in pursuing a graduate or professional program at ACPHS.

Please contact Kevin Rivenburg in the Office of Admissions to determine which category of student best describes you and your interests!

ACADEMICS

The academic programs of the College seek to instill values, attitudes, and skills that enable lifelong intellectual, cultural, personal, and professional growth. Through a 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 in it.

College-wide academic standards apply to all ACPHS students.

Individual programs may have additional academic standards and policies with enhanced stringency that will supersede the respective 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: *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.*

ACADEMICS

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" procedure below.

- At the discretion of the instructor and department chair, 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.

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.***

ACADEMICS

Course Concerns Procedure

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

1. Discuss with the faculty member teaching the course or section of the course. 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 with the faculty member, consult the course coordinator.
3. If an acceptable resolution is not achieved with the course coordinator, the student may contact the *Department Chair, who has final say.

**Should the Faculty member or the course coordinator be a Department Chair, students can appeal in writing to the Dean of the College on the Albany campus or Regional Dean on the Vermont campus. The Dean's decision will be final.*

Academic Standing and Progression

Good academic standing (GAS) does not ensure entry into the College's professional programs.

College-wide (Bachelor's and Early Assurance Pre-Pharmacy)	PharmD and Accelerated PharmD	Master's
Must attain and maintain a semester and cumulative GPA of 2.0 in the first two years of the curriculum. **Specific for Bachelor's in CLS:** 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: Maintain a semester and cumulative professional GPA of 3.0. Professional courses are defined as required courses bearing a CLS prefix. The professional GPA is calculated based on the grades from all professional courses taken. 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	**Professional courses** are defined as all required courses in the P1-P4 and AP1-AP3 years of the Doctor of Pharmacy Program, including professional electives, regardless of whether taken during the P1–P4 years and AP1-AP2 or earlier. **Professional GPA** is determined using grades earned in all professional courses. Professional courses with grades below C- must be repeated. **Progression in Experiential Education:** Students in the PharmD program are required to complete two types of experiential education rotations: Introductory Pharmacy Practice Experience(IPPE): Students must be in GAS to progress into their Community, Institutional, and Team Based Care IPPEs. Students who are not in GAS will use the summer and ensuing months to repeat coursework to attain GAS and will be rescheduled for their rotations, as determined by Experiential Education. For student in both the Traditional and Accelerated Programs, rescheduled IPPEs may result in a delay in graduation. *Note: For students in the Accelerated Program, delays may necessitate a transfer to the Traditional Program.* Advanced Pharmacy Practice Experience (APPE): Students	Cumulative GPA of 3.0 or higher and be free of any probationary status; **Required Courses:** Students must earn a grade of B or better in all required graduate courses; **Elective Courses:** Students are permitted only one grade in the range of B- to C- in elective courses. If less than a C- is earned, the student must remediate the elective course or take a different elective; Demonstrate satisfactory progress in thesis research, capstone or clinical practicum as documented by recommendations from the thesis/faculty advisor and the grades of related thesis courses to be considered in good academic standing. All courses, whether accepted toward graduation credit or not, are recorded on a student's transcript and count in GPA calculations.

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. *See Early Assurance Progression into the P1 year and Non-Progression below.*	must successfully complete the entire pre-APPE curiculum, including IPPEs, and be in GAS to progress in to the APPEs. *Note: Violations of the Conduct Code, Professionalism Code, and/or Academic Integrity may prevent students from progressing into and through the Experiential Education curriculum.*	

Early Assurance Pre-Pharmacy Progression 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 semester prior to progression. The interview will include a face-to-face conversation with two faculty or staff members of the College. Only students who attain a GPA > 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.

ACADEMICS

Doctor of Pharmacy Non-Progression:

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:

1. a minimum cumulative GPA of 2.5 or higher.
2. 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:

1. Remediate one or more courses during the summer months prior to entering the P1 year.
2. Students may be required to earn minimum grades in remediated courses or to take courses at ACPHS when available.
3. Take a writing course, retake the writing evaluation or obtain ESL assistance prior to or during the P1 year.
4. Take or re-take the PCAT exam.

- The committee makes a recommendation to the Dean, 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 Transfer to another Program below.*

Doctor of Pharmacy Failure to Progress:

- 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.

ACADEMICS

Doctor of Pharmacy One-year Extension Appeal Granted:

- Remain in the pre-pharmacy program during the remediation year and reapply for admission to the P1 year. Note: A student must accept the planned course of study for the appeal to be granted.

- 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. 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.

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 Transfer to another Program below.*

Probation Process for Master's Students:

1. Recommendations for probation are made to the Program Director;
2. The Program Director forwards the recommendation to the Academic Standards Committee (ASC).
3. The ASC renders a final decision and consults with the Program Director as to how to proceed with the student's academic probation.
4. Students placed on academic probation by the ASC will be informed by the Registrar's Office via a letter from the Dean.

Note: *A recommendation for academic probation due to unsatisfactory progress in thesis research or capstone project may be initiated by the student's faculty advisor if the advisor considers a student's performance to be unsatisfactory irrespective of a student's grade point average.*

Removal from Academic Probation for Master's Programs:

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 less than a B in a required course or more than one grade of less than a C- in an 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 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 Program Director.

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. *See Transfer to another Program below.*
Students dismissed from the College can also seek re-admission to ACPHS as transfer students.

College-wide **(Bachelor's and Pre-Pharmacy)**	PharmD and Accelerated PharmD	Master's
Dismissal 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	*Dismissal from the program for any of the following reasons below:* Two instances of probation (whether consecutive or non-consecutive) resulting from didactic or experiential coursework in the Doctor of Pharmacy program; A semester GPA below 1.6; Failure to successfully complete APPE Performance Improvement Plan* *To be implemented for the class of 2022 and beyond.	*Dismissal 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. ***Other requirements:*** Full-time graduate students must complete all program degree requirements in 3 years or less. Part-time graduate students must complete all program degree requirements in 7 years or less. Students dismissed from a graduate program will be informed by the Program Director and the decision will be communicated to the student's advisors, the Dean and the Registrar's office.

ACADEMIC APPEAL PROCESS

Students are permitted to appeal academic standing and progression decisions (except academic probation) by completing a form and supporting documentation. The process and forms can be found at: https://www.acphs.edu/academic-standing-progression-appeals-process-0

Transfer to Another Program

Students wishing to transfer to another program at the College should:

1. Contact the program director of the program you are dismissed from, your faculty advisor, and your academic advisor (Triangle of Academic Success) to seek guidance regarding alternative programs;

2. Meet with the program director of the program you wish to transfer to discuss curricular options, review course credits, and plan your degree path;

3. Consult with Financial Aid to discuss potential financial aid implications of transferring to another program;

4. Once an appropriate plan is determined, complete the Internal Transfer into an ACPHS Program form on the Registrar's intranet page and submit to the Registrar with appropriate signatures.

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. Courses taken at other institutions during the dismissal period will be reviewed for approval as transfer credits upon re-admission to the College.

Re-Admission Policy Pharmacy Program:

Individuals who have been dismissed from the Pharmacy Program for academic reasons may reapply to the Pharmacy Program through PharmCAS (see http://www.pharmcas.org for details and application deadlines). A supplemental application for readmission will be sent to the applicant following receipt of the PharmCAS application. The same admission standards for the P1 applicants will apply. The Pharmacy Admissions Committee will make a determination regarding admission, including conditional acceptance, and work with the program director for class year placement for students dismissed from the program in the P2, P3 or P4 year. Contact the Admissions office for further information at admissions@acphs.edu.

2021-22 Academic Appeals Timelines		
ACTION	**Fall 2021 Academic Semester**	**Spring 2022 Academic Semester**
Final grades due to Registrar	Monday, December 13, 2021	Friday, May 6, 2022
ASC meets	Tuesday, December 14, 2021	Tuesday, May 10, 2022
Probation/Dismissal letters sent to students	Wednesday, December 15, 2021	Wednesday, May 11, 2022
Last day to receive Appeal	Monday, January 3, 2022 11:59 pm	Wednesday, May 18, 2022
ASPC meets	Wednesday, January 5, 2022	Friday, May 20, 2022 AM
ASPC recommendations to Dean	Thursday, January 6, 2022	Friday, May 20, 2022 PM
Dean notifies students of final decision	Friday, January 7, 2022	Monday, May 23, 2022
Deadline for students to notify Dean of their decision to accept the conditions of a granted appeal	Monday, January 10, 2022 1st day of Spring Semester	Friday, May 27, 2022

See Academic Appeals Process and Action Timeline at https://www.acphs.edu/academic-appeals-process.

2020-21 Academic Policies

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. 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.*

Attendance Policy: Students are expected to attend all assigned classes. 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; 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 non-COVID-19 related absences resulting from the above factors. Any students with COVID-19 symptoms should not attend classes. Doctor's notes will not be required for COVID-19 related illness. For students who are experiencing COVID-19 symptoms, you must report symptoms in the daily Share My Health screener; you will be instructed not to join classes. Upon reporting of symptoms, a link will be provided from SMH to immediately schedule a test at the campus COVID-19 testing center; home testing is not acceptable. Faculty members will be notified by the Office of Student Affairs if a student will miss an in-person lecture(s) due to COVID-19 related issues. Any falsification of COVID-19 symptoms is considered academic dishonesty; this behavior will be subject to the Academic Integrity policy.

Academic Accommodations: ACPHS students who seek reasonable academic accommodations under the Americans with Disabilities Act or Section 504 of the Rehabilitation Act are responsible for contacting the Director of Counseling and Wellness (peter.cornish@acphs.edu) to discuss the process for making a request for academic accommodations. The request should be made as soon as possible to ensure sufficient time to implement accommodations, if approved, prior to the onset of course assessments. The link below provides additional information: http://www.acphs.edu/about/student-consumer-info/accommodations-under-americans-disabilities-act

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 Department Chair in which the course is housed to determine the possibility of providing accommodations.

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.

Long-Term Absence: 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 Vice President for Student Affairs in consultation with the student's Triangle of Success. For leave, the request must state the reason(s) for the leave, the duration desired and supporting documentation. In some cases, the Vice President for Student Affairs may request to meet in person with the student. The Vice President for Student Affairs 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 Triangle of Success.

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 a minimum of 18 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.
- Coursework 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 minimum of 6 credits must be provided by non-required courses of the program (free electives/professional electives/bioselectives/directed electives/liberal arts electives are not considered required courses for the purposes of Minor completion.
- 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 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.

Course Withdrawal:

- Students are allowed to drop a course within the first week of the semester without the course appearing on their 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 9th 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. At the discretion of the Program Director, 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.

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. 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.

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 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.
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 complete the College Withdrawal Form (found on the Registrar's Intranet page) and meet with their Triangle of Success. At the discretion of the Triangle of Success, a grade of "W" may be assigned to courses or course instructors may be asked to assign a grade.
Student Conduct Suspension and Expulsion: *See Student Handbook*

Transfer Credit Policy

Transfer Credit: At the time of admission to the College, new incoming students may request transfer of academic credit from Advanced Placement (AP) courses, International Baccalaureate (IB), or undergraduate college courses taken at another US accredited academic institution. The evaluation of academic credit for new first-year or transfer students is coordinated by the Office of Admissions and Registrar. Decisions made regarding acceptance of transfer credit are final once the student's first semester at ACPHS begins.

- 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.
- Unless otherwise noted, grades of C or better are required to receive credit for college courses taken at another regionally accredited academic institution.

Special provisions may be in place for students in Early Assurance or joint academic programs that supersede the overall Transfer Credit Policy and are at the discretion of the Program Director for the respective program.

Since our curriculum evolves frequently, past granting of credit does not guarantee that the course will transfer in the future.

Taking Courses at Other Academic Institutions: Upon matriculation, students are required to take all required coursework at ACPHS. 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 Dean. Any number of Elective credits can be taken at institutions other than ACPHS.

See the most up-to-date Transfer Credit Policy at https://www.acphs.edu/transfer-credit-policy

BACHELOR'S PROGRAMS:

B.S. Biomedical Technology

X	#	Course name	cr		X	#	Course name	cr
	BIO 101	General Biology I	4			BIO 102	General Biology II	4
	CHE 101	General Chemistry I	4			CHE 102	General Chemistry II	4
	HUM101	Pre-Modern World	3			HUM102	Modern World	3
	COM115	Principles of Communication	3			MAT145	Elementary Statistics	3
	PSY101	General Psychology	3				Elective	3
		Total	17				Total	17

X	#	Course name	cr		X	#	Course name	cr
	HUM201	Contemporary World	3			BIO 235/236	Cell Biology with lab	4
	BHS201	Medical Terminology	3			CHE245	Survey of Organic Chemistry	4
	BIO 213	Anatomy & Physiology I Lecture	3			BHS230	Sophomore Seminar in Biomedical Technology	3
	BIO 214	Anatomy & Physiology I Lab	1			BIO 215	Anatomy & Physiology II Lecture	3
	BIO 225	Genetics	3			BIO 216	Anatomy & Physiology II Lab	1
		Directed Elective-SOC	3					
		Total	16				Total	15

X	#	Course name	cr		X	#	Course name	cr
	CLS327/328	Clinical Microbiology I	4			CLS329/330	Clinical Microbiology II	4
	CLS317/318	Clinical Hematology	4			CLS346/347	Clinical Chemistry	4
	CLS307/308	Urinalysis and Body Fluids	2			CLS339/340	Immunohematology	4
	CHE311	Biochemistry	3			CLS337/338	Clinical Immunology	4
	CLS 348	Clinical Biochemical Techniques	1					
	ETH310	Bioethics	3					
		Total	17					16

X	#	Course name	cr		X	#	Course name	cr
	BHS345	UG Molecular Diagnostics	3			BHS450	Senior Seminar in Biomedical Technology	3
	BHS346	UG Molecular Diagnostics-Lab	1				Directed Electives	9
	BHS 410	Clinical Correlations for Health Care Professionals	3					
	BHS360	Clinical Anatomy	3					
		Directed Electives	6					
		Total	16				Total	12

Total Credit Hours = **126**

BACHELOR'S PROGRAMS
CLINICAL LAB SCIENCES CURRICULUM

X	#	Course name	cr		X	#	Course name	cr
	BIO 101	General Biology I	4			BIO 102	General Biology II	4
	CHE 101	General Chemistry I	4			CHE 102	General Chemistry II	4
	HUM101	Pre-Modern World	3			HUM102	Modern World	3
	COM115	Principles of Communication	3			MAT145	Elementary Statistics	3
	PSY101	General Psychology	3				Elective	3
		Total	17				Total	17

X	#	Course name	cr		X	#	Course name	cr
	HUM201	Contemporary World	3			BIO 235/236	Cell Biology with lab	4
	BHS201	Medical Terminology	3			CHE245	Survey of Organic Chemistry	4
	BIO 213	Anatomy & Physiology I Lecture	3			BHS230	Sophomore Seminar in Biomedical Technology	3
	BIO 214	Anatomy & Physiology I Lab	1			BIO 215	Anatomy & Physiology II Lecture	3
	BIO 225	Genetics	3			BIO 216	Anatomy & Physiology II Lab	1
		Directed Elective-SOC	3				Elective	3
		Total	16				Total	18

X	#	Course name	cr		X	#	Course name	cr
	CLS327/328	Clinical Microbiology I	4			CLS329/330	Clinical Microbiology II	4
	CLS317/318	Clinical Hematology	4			CLS346/347	Clinical Chemistry	4
	CLS307/308	Urinalysis and Body Fluids	2			CLS339/340	Immunohematology	4
	CHE311	Biochemistry	3			CLS337/338	Clinical Immunology	4
	CLS 348	Clinical Biochemical Techniques	1					
	ETH310	Bioethics	3					
		Total	17					16

X	#	Course name	cr		X	#	Course name	cr
	CLS401	Clinical Practicum I	9			CLS402	Clinical Practicum II	9
	BHS345	Molecular Diagnostics	3			CLS410	Clinical Correlations	3
	BHS346	Molecular Diagnostics-Lab	1					
	CLS 400	Laboratory Management and Education	3					
		Total	16					12

Total Credit Hours = **129**

BS/MS CLINICAL LAB SCIENCES GRID

X	#	Course name	cr		X	#	Course name	cr
	BIO 101	General Biology I	4			BIO 102	General Biology II	4
	CHE 101	General Chemistry I	4			CHE 102	General Chemistry II	4
	HUM101	Pre-Modern World	3			HUM102	Modern World	3
	COM115	Principles of Communication	3			MAT145	Elementary Statistics	3
	PSY101	General Psychology	3				Elective	3
		Total	17				Total	17

X	#	Course name	cr		X	#	Course name	cr
	HUM201	Contemporary World	3			BIO 235/236	Cell Biology with lab	4
	BHS201	Medical Terminology	3			CHE245	Survey of Organic Chemistry	4
	BIO 213	Anatomy & Physiology I Lecture	3			BHS230	Sophomore Seminar in Biomedical Technology	3
	BIO 214	Anatomy & Physiology I Lab	1			BIO 215	Anatomy & Physiology II Lecture	3
	BIO 225	Genetics	3			BIO 216	Anatomy & Physiology II Lab	1
		Directed Elective-SOC	3					
		Total	16				Total	15

X	#	Course name	cr		X	#	Course name	cr
	CHE311	Biochemistry	3			BHS450	Senior Seminar in Biomedical Technology	3
	CLS 348	Clinical Biochemical Techniques	1			BHS365	Intro to Human Pathology	3
	BHS360	Clinical Anatomy	3				Directed Elective	3
	BHS 410	Clinical Correlations for Health Care Professionals	3				Directed Elective	3
	ETH310	Bioethics	3				Directed Elective	3
		Directed Elective	3					
		Total	16				Total	15

Graduate Year 1 (G1)

X	#	Course name	cr		X	#	Course name	cr
	CLS610	Clinical Microbiology I	4			CLS620	Clinical Microbiology II	4
	CLS650	Clinical Hematology and Hemostasis	4			CLS640	Clinical Chemistry	4
	CLS655	Urinalysis and Body Fluids	2			CLS660	Immunohematology	4
	PSC672	Experimental Design and Data Analysis	2			CLS630	Clinical Immunology	4
	ETH610	Ethics in Research	1			BIO650	Research Design	2
		Total	13				Total	18

Graduate Year 2 (G2)

X	#	Course name	cr		X	#	Course name	cr
	CLS770	Clinical Practicum I	9			CLS780	Clinical Practicum II	9
	BHS745	Molecular Diagnostics w/lab	4			CLS760	Clinical Correlations	3
	BHS730	Advanced Good Laboratory Practices/Laboratory Management	3			BHS740	Genetics and Molecular Basis of Disease	3
						BHS790	Capstone	3
		Total	16				Total	18

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., biomedical and health care sector, infectious disease epidemiology, public health microbiology, and biopharmaceutical 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, Infectious Disease Epidemiology & Public Health Microbiology, or Industrial & Biopharmaceutical 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).

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, Cell Biology, and Molecular Biology. Graduates would be prepared for entry into the professional schools such as medicine, physician assistant, veterinary, dental, and other health professions. Graduates may also find jobs in academic and industrial research laboratories working in the area of microbiology, immunology, and infectious diseases.

INFECTIOUS DISEASE EPIDEMIOLOGY & PUBLIC HEALTH MICROBIOLOGY 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 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 on infectious diseases will be extremely useful.

INDUSTRIAL & BIOPHARMACEUTICAL MICROBIOLOGY TRACK will prepare the students for the scientific principles, techniques and skills required in industrial and biopharmaceutical microbiology. Specialized study will include bioprocessing and biomanufacturing including microbial fermentation, mammalian cell culture, and downstream processing of biopharmaceutical products. The program will focus on pharmaceutical microbiology including microbial contamination prevention, investigation, control and aseptic processing, and principles of Good Manufacturing Practices. Graduates will also acquire knowledge in regulatory affairs.

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 111 and 121: General Biology I and II (4, 4)
CHE 111 and CHE 121: 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)][2]

Microbiology: 33 required credits
BIO 210: Microbiology (4)
PSC 315: Immunology (3)
CHE 311 or 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)[3]
BIO 345: Microbiology Journal Club (1+1) – course is taken twice
BIO 380: Microbiology Seminar (0)- every semester.
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.

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

TRACK CURRICULUM

BIOMEDICAL MICROBIOLOGY TRACK

BIO 240: Virology (3)
BIO 365: Medical Mycology and Parasitology (3)
BIO 680G: Bacterial Pathogenesis (3)
A minimum of 5 credits chosen from BIO 225: Genetics (3), BIO 213: Anatomy & Physiology I (3), BIO 215: Anatomy & Physiology II (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), BIO 690G: Viral Pathogenesis (3), BIO 627G: Innate Immunology (3), BHS 745G: Molecular Diagnostics (3). Other courses may be counted at the discretion of the Program Director.

INFECTIOUS DISEASE EPIDEMIOLOGY & PUBLIC HEALTH MICROBIOLOGY TRACK

PBH 120: Introduction to Public Health (3)
PBH 350: Epidemiology (3)
BIO 315: Public Health Microbiology (3)
A minimum of 5 credits chosen from BIO 213: Anatomy & Physiology I (3), BIO 215: Anatomy & Physiology II (3), PBH 220: Environmental Health (3), PBH 320: Geography of Health (3), SOC 335: Global Health (3), PHM 350, 450: Applied Methods in Epidemiological Research (3), PAD 693: Epidemiology I (3). Other courses may be counted at the discretion of the Program Director.

INDUSTRIAL & BIOPHARMACEUTICAL MICROBIOLOGY TRACK

BIO 348: Microbial Fermentation (3)
BIO 331: Mammalian Cell Culture (3)
BIO 410: Pharmaceutical Microbiology (3)
A minimum of 5 credits chosen from PSC 312: Regulatory Science, PHM 324: Pharmaceuticals and Biopharmaceuticals Industry Entrepreneurship, PSC 625G: Clinical Biochemistry, BIO 641G: Current Topics in Biopharmaceutical Technology. 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.

*All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

[2,3] Students in Industrial Microbiology Track will replace BIO 355: Biomedical Lab Techniques II with PSC 320: Downstream Processing of Biopharmaceutical Products; and BIO 253: Scientific Communication with PSC 610G: Technical Writing for the Biopharmaceutical Industry

I. BIOMEDICAL MICROBIOLOGY TRACK SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 235	Cell Biology	3
	Elective 2	3			Elective 3	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 240	Virology	3
PSC 315	Immunology	3		BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3		BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3		BIO 355	Biomedical Lab Techniques II	3
	Elective 4	3			Elective 5	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
BIO 253	Scientific Communication	2		BIO 680G	Bacterial Pathogenesis	3
BIO 345	Journal Club	1		BIO 345	Journal Club	1
	Track Elective I	3			Track Elective II	3
	Elective 6	3			Elective 7	3
	Total	**12**			**Total**	**13**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

II. INFECTIOUS DISEASE EPIDEMIOLOGY & PUBLIC HEALTH MICROBIOLOGY TRACK SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2	BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**		**Total**	**16**

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 235	Cell Biology	3
PBH 120	Introduction to Public Health	3		Elective 2	3
	Total	**18**		**Total**	**17**

Year 3					
Fall semester		**Credits**	**Spring Semester**		**Credits**
CHE 311	Biochemistry	3	BIO 340	Microbial Genetics	3
PSC 315	Immunology	3	BIO 355	Biomedical Lab Techniques II	3
BIO 370	Microbial Physiology	3		Track Elective I	3
BIO 350	Biomedical Lab Techniques I	3		Elective 3	3
BIO 315	Public Health Microbiology	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
BIO 253	Scientific Communication	2		Track Elective II	3
BIO 345	Journal Club	1	BIO 345	Journal Club	1
PBH 350	Epidemiology	3		Elective 6	3
	Elective 5	3		Elective 7	3
	Total	**12**		**Total**	**13**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

III. INDUSTRIAL & BIOPHARMACEUTICAL MICROBIOLOGY TRACK SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 235	Cell Biology	3
	Elective 2	3			Elective 3	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 331	Mammalian Cell Culture	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 348	Microbial Fermentation	3		PSC 320	Downstream Processing of Biopharmaceutical Products	3
BIO 350	Biomedical Lab Techniques I	3		BIO 410	Pharmaceutical Microbiology	3
	Elective 4	3			Track Elective I	3
	Elective 5	3				
	Total	**18**			**Total**	**15**

Year 4						
Fall semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3			INDUSTRY CO-OP	0
BIO 370	Microbial Physiology	3		BIO 485	Micro. Capstone Experience II	3
BIO 345	Journal Club	1		BIO 345	Journal Club	1
	Track Elective II	3			Elective 7	3
PSC 610	Technical Writing for Biopharmaceutical Industry	2				
	Elective 6	3				
	Total	**15**			**Total**	**7**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

B.S. MICROBIOLOGY / M.S. MOLECULAR BIOSCIENCES DUAL DEGREE SAMPLE SCHEDULE

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 provides 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.

B.S. Microbiology students are required to apply to the program in their Junior Year. GRE requirements are waived for internal students with a GPA > 3.0. In addition to curricular requirements for both the B.S. and M.S. degree programs **(details can be found under B.S. Microbiology and M.S. Molecular Biosciences Curriculum)**, students enrolled in the joint degree program will have the following requirements:

1. Nine credits (highlighted courses in the sample grids) can count jointly towards the B.S. and the M.S. degrees.
2. Students will be encouraged to choose B.S. Microbiology capstone topic in consultation with M.S. Molecular Biosciences faculty so that the capstone research can be expanded to a Capstone Project or Master's thesis.
3. In order to complete the dual degrees in five years, students will be strongly encouraged to utilize two summers (between 3rd and 4th year and between 4th and 5th year) to complete their Capstone/Thesis project.
4. For M.S. Molecular Biosciences Thesis Track students, Research Rotation (Graduate) and Capstone Experience (Undergraduate) in the Fourth year of Undergraduate/First Year of Graduate study will run concurrently under one Faculty mentor.

B.S. MICROBIOLOGY (BIOMEDICAL TRACK)/ M.S. MOLECULAR BIOSCIENCES (THESIS TRACK) SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2	BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**		**Total**	**16**

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 235	Cell Biology	3
	Elective 2	3		Elective 3	3
	Total	**18**		**Total**	**17**

Year 3					
Fall semester		**Credits**	**Spring Semester**		**Credits**
CHE 311	Biochemistry	3	BIO 240	Virology	3
PSC 315	Immunology	3	BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3	BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3	BIO 355	Biomedical Lab Techniques II	3
	Elective 4	3		Elective 5	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
BIO 253	Scientific Communication	2	BIO 680G	Bacterial Pathogenesis (Graduate Elective 1)	3
BIO 345	Journal Club (UG-1)	1	BIO 345	Journal Club (UG-2)	1
	Elective 6	3		Elective 7	3
BIO625G	Adv. Mol. Biology (Track Elective I)	3	BIO 630G	Adv. Cell Biology (Track Elective II)	3
MAT610G	Statistical Inference and Modeling	3	BIO650G	Research Design	2
BIO670G	Research Rotation	2		Graduate Elective 2	3
	Total	**17**		**Total**	**18**

Year 5						
Fall semester		**Credits**		**Spring Semester**		**Credits**
ETH610G	Ethics in Research	1		BIO702G	Thesis Research	3
BIO701G	Thesis Research	3			Graduate Elective 4	3
BIO660G	Journal Club (G-1)	1				
	Graduate Elective 3	3				
	Total	**8**			**Total**	**6**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

Students can simultaneously count 9 credits towards each of the two degree programs (BS and MS).

B.S. MICROBIOLOGY (BIOMEDICAL TRACK)/ M.S. MOLECULAR BIOSCIENCES (CAPSTONE TRACK) SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 235	Cell Biology	3
	Elective 2	3			Elective 3	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 240	Virology	3
PSC 315	Immunology	3		BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3		BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3		BIO 355	Biomedical Lab Techniques II	3
	Elective 4	3			Elective 5	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
BIO 253	Scientific Communication	2		BIO 680G	Bacterial Pathogenesis (Graduate Elective 2)	3
BIO 345	Journal Club (UG-1)	1		BIO 345	Journal Club (UG-2)	1
	Elective 6	3			Elective 7	3
BIO625G	Adv. Mol. Biology (Track Elective I)	3		BIO630G	Adv. Cell Biology (Track Elective II)	3
MAT610G	Statistical Inference and Modeling	3		BIO650G	Research Design	2
	Graduate Elective 1	3			Graduate Elective 3	3
	Total	**18**			**Total**	**18**

Year 5						
Fall semester		**Credits**		**Spring Semester**		**Credits**
ETH610G	Ethics in Research	1			INDUSTRY CO-OP	0
	Graduate Elective 4	3		BIO665G	Molecular Biosciences Capstone Course	4
	Graduate Elective 5	3		BIO660G	Journal Club (G-2)	1
BIO660G	Journal Club (G-1)	1				
	Total	**8**			**Total**	**5**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

Students can simultaneously count 9 credits towards each of the two degree programs (BS and MS).

B.S. MICROBIOLOGY (INFECTIOUS DISEASE EPIDEMIOLOGY TRACK)/ M.S. MOLECULAR BIOSCIENCES (THESIS TRACK) SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2	BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**		**Total**	**16**

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 235	Cell Biology	3
PBH 120	Introduction to Public Health	3		Elective 2	3
	Total	**18**		**Total**	**17**

Year 3					
Fall semester		**Credits**	**Spring Semester**		**Credits**
CHE 311	Biochemistry	3	BIO 340	Microbial Genetics	3
PSC 315	Immunology	3	BIO 355	Biomedical Lab Techniques II	3
BIO 370	Microbial Physiology	3		Track Elective 1	3
BIO 350	Biomedical Lab Techniques I	3		Elective 3	3
PBH 350	Epidemiology	3		Elective 4	3
				Elective 5	3
	Total	**15**		**Total**	**18**

Year 4					
Fall semester		**Credits**	**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3	BIO 485	Micro. Capstone Experience II	3
BIO 253	Scientific Communication	2	PAD 693	Epidemiology (Track elective 2/Graduate Elective 2)	3
BIO 615	Public Health Microbiology (Graduate Elective 1)	3	BIO 345	Journal Club (UG-2)	1
BIO 345	Journal Club (UG-1)	1	BIO 630G	Adv. Cell Biology	3
BIO625G	Adv. Mol. Biology	3	BIO650G	Research Design	2
MAT610G	Statistical Inference and Modeling	3		SUNY transfer course by PD permission (Elective 6/Graduate Elective 3)	3
BIO670G	Research Rotation	2		Elective 7	3
	Total	**17**		**Total**	**18**

Year 5						
Fall semester		**Credits**		**Spring Semester**		**Credits**
ETH610G	Ethics in Research	1		BIO702G	Thesis Research	3
BIO701G	Thesis Research	3				
BIO660G	Journal Club (G-1)	1				
	Graduate Elective 4	3				
	Total	**8**			**Total**	**3**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

Students can simultaneously count 9 credits towards each of the two degree programs (BS and MS).

B.S. MICROBIOLOGY (INFECTIOUS DISEASE EPIDEMIOLOGY TRACK)/ M.S. MOLECULAR BIOSCIENCES (CAPSTONE TRACK) SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2	BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**		**Total**	**16**

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 235	Cell Biology	3
PBH 120	Introduction to Public Health	3		Elective 2	3
	Total	**18**		**Total**	**17**

Year 3					
Fall semester		**Credits**	**Spring Semester**		**Credits**
CHE 311	Biochemistry	3	BIO 340	Microbial Genetics	3
PSC 315	Immunology	3	BIO 355	Biomedical Lab Techniques II	3
BIO 370	Microbial Physiology	3		Track Elective 1	3
BIO 350	Biomedical Lab Techniques I	3		Elective 3	3
PBH 350	Epidemiology	3		Elective 4	3
				Elective 5	3
	Total	**15**		**Total**	**18**

Year 4					
Fall semester		**Credits**	**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3	BIO 485	Micro. Capstone Experience II	3
BIO 253	Scientific Communication	2	PAD 693	Epidemiology (Track elective 2/Graduate Elective 2)	3
BIO 345	Journal Club (UG-1)	1	BIO 345	Journal Club (UG-2)	1
BIO 615	Public Health Microbiology (Graduate Elective 1)	3		SUNY transfer course- PD permission (Elective 6/Graduate Elective 3)	3
BIO625G	Adv. Mol. Biology	3	BIO630G	Adv. Cell Biology	3
MAT610G	Statistical Inference and Modeling	3	BIO650G	Research Design	2
	Graduate Elective 1	3		Elective 7	3
	Total	**18**		**Total**	**18**

Year 5						
Fall semester		**Credits**		**Spring Semester**		**Credits**
ETH610G	Ethics in Research	1			INDUSTRY CO-OP	0
	Graduate Elective 4	3		BIO665G	Molecular Biosciences Capstone Course	4
	Graduate Elective 5	3		BIO660G	Journal Club (G-2)	1
BIO660G	Journal Club (G-1)	1				
	Total	**8**			**Total**	**5**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

Students can simultaneously count 9 credits towards each of the two degree programs (BS and MS).

B.S. MICROBIOLOGY (INDUSTRIAL MICROBIOLOGY TRACK)/ M.S. MOLECULAR BIOSCIENCES (THESIS TRACK) SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 235	Cell Biology	3
	Elective 2	3			Elective 3	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 331	Mammalian Cell Culture	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 370	Microbial Physiology	3		PSC 320	Downstream Processing of Biopharmaceutical Products	3
BIO 350	Biomedical Lab Techniques I	3			Elective 6	3
	Elective 4	3			Elective 7	3
	Elective 5	3				
	Total	**18**			**Total**	**15**

Year 4						
Fall semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3		BIO 485	Micro. Capstone Experience II	3
BIO 648	Micro. Fermen. (Grad. Elective 1)	3		BIO 345	Journal Club (UG-2)	1
BIO 345	Journal Club (UG-1)	1		BIO 655	Pharmaceutical Microbiology (Graduate Elective 2)	3
	Track Elective I	3		BIO 641	Current Topics in Biopharm. Tech. (Track Elect. 2/Grad. Elect. 3)	3
PSC 610	Technical Writing for Biopharmaceutical Industry	2		BIO630G	Adv. Cell Biology	3
MAT610G	Statistical Inference and Modeling	3		BIO650G	Research Design	2
BIO670G	Research Rotation	2				
	Total	**17**			**Total**	**15**

Year 5						
Fall semester		**Credits**		**Spring Semester**		**Credits**
ETH610G	Ethics in Research	1		BIO702G	Thesis Research	3
BIO701G	Thesis Research	3				
BIO660G	Journal Club (G-1)	1				
BIO 625G	Advanced Molecular Biology	3				
	Graduate Elective 4	3				
	Total	**11**			**Total**	**3**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

Students can simultaneously count 9 credits towards each of the two degree programs (BS and MS).

B.S. MICROBIOLOGY (INDUSTRIAL MICROBIOLOGY TRACK)/ M.S. MOLECULAR BIOSCIENCES (CAPSTONE TRACK) SAMPLE SCHEDULE

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 235	Cell Biology	3
	Elective 2	3			Elective 3	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 331	Mammalian Cell Culture	3
PSC 315	Immunology	3		BIO 340	Microbial Genetics	3
BIO 370	Microbial Physiology	3		PSC 320	Downstream Processing of Biopharmaceutical Products	3
BIO 350	Biomedical Lab Techniques I	3			Elective 6	3
	Elective 4	3			Elective 7	3
	Elective 5	3				
	Total	**18**			**Total**	**15**

Year 4						
Fall semester		**Credits**		**Spring Semester**		**Credits**
BIO 480	Micro. Capstone Experience I	3		BIO 485	Micro. Capstone Experience II	3
BIO 648	Microbial Fermentation (Graduate Elective 1)	3		BIO 345	Journal Club (UG-2)	1
BIO 345	Journal Club (UG-1)	1		BIO 655	Pharmaceutical Microbiology (Graduate Elective 2)	3
	Track Elective I	3		BIO 641	Current Topics in Biopharm. Technology (Track Elective 2/Graduate Elective 3)	3
PSC 610	Technical Writing for Biopharmaceutical Industry	2		BIO630G	Adv. Cell Biology	3
MAT610G	Statistical Inference and Modeling	3		BIO650G	Research Design	2
	Total	**15**			**Total**	**15**

Year 5						
Fall semester		**Credits**		**Spring Semester**		**Credits**
ETH610G	Ethics in Research	1			INDUSTRY CO-OP	0
BIO 625G	Adv. Mol. Biology	3		BIO665G	Molecular Biosciences Capstone Course	4
	Graduate Elective 4	3		BIO660G	Journal Club (G-2)	1
BIO660G	Journal Club (G-1)	1			Graduate Elective 5	3
	Total	**8**			**Total**	**8**

*First Year students are automatically registered for the SEA-PHAGE sequence as their elective choice. Students wishing to take another elective should contact the Program Director.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

Students can simultaneously count 9 credits towards each of the two degree programs (BS and MS).

BACHELOR'S DEGREES
PHARMACEUTICAL SCIENCES

Albany College of Pharmacy and Health Sciences (ACPHS) offers a four-year bachelor's degree in *Pharmaceutical Sciences*, which prepares students for careers in research, health care, and industry. This program challenges students to develop the critical thinking, communication, and leadership skills necessary for self-directed learning and academic independence.

Pharmaceutical Sciences is 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 incorporating pharmacology, pharmaceutics, biotechnology, and bioanalytics. Graduates with an in-depth knowledge of pharmaceutical sciences are in high demand in many fields, including the pharmaceutical industry and healthcare professions.

PREPARE FOR AN EXCITING CAREER

Your successful career journey starts here in the Bachelor of Science in Pharmaceutical Sciences (BSPS) program where you will help write the next chapter in a long history of accomplished alumni. The 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, PA, and other health and science focused educational pathways. Our joint Bachelor/Master program in pharmaceutical sciences (BS/MS) enhances our academic offerings and research focus to allow students to gain both their bachelor's and master's degrees in only five years.

Whether you are interested in the medical professions or pursuing an exciting career in the pharmaceutical industry, the BSPS program at ACPHS will help you to realize your goals.

RESEARCH FOCUSED

Research opportunities provide the foundation for ACPHS's Pharmaceutical Sciences program, and the ability to engage in research as an undergraduate student is an exciting prospect, no matter your choice of career path. One-on-one research experiences with the Pharmaceutical Sciences faculty is a hallmark of the BSPS program. Pharmaceutical Sciences faculty expertise spans cancer biology to neurodevelopment, addiction to molecular modeling—so you can identify a mentor and research project that aligns with your interests!

Graduates in Pharmaceutical Sciences, whether at the bachelor's or master's level, have gone on to exciting careers in academia and the pharmaceutical industry, including Regeneron in nearby Rensselaer, national pharmaceutical companies like Glaxo SmithKline, Pfizer, and the FDA. Gaining technical skills during your undergraduate studies will set you up for success in any career path you choose.

The Pharmaceutical Sciences program is proud to be an integral partner in ACPHS's new Center for Biopharmaceutical Education and Training (CBET), which is housed at the SUNY College of Nanoscale Science and Engineering campus. BSPS and MSPS students will have the opportunity to be trained in cutting-edge technologies driving some of the fastest growing fields in the pharmaceutical industry!

PATHWAYS

Graduates of this program have become physicians, researchers, industry leaders, lawyers, and more—the opportunities are endless! Students in Pharmaceutical Sciences can also take advantage of several dual-degree programs at the College including but not limited to: Early Assurance BS/MD and BS/DO articulation agreements with several medical schools, a 5-year joint BS/MS Pharmaceutical Sciences degree, a BS/MBA joint program with Clarkson University, and a BS/JD degree with Albany Law School. Our rigorous curriculum has successfully prepared students for medical training in MD, DO, and PA programs, and completion of the BSPS degree includes a pre-med minor.

BSPS PROGRAM OF STUDY:

The Albany College of Pharmacy and Health Sciences' four-year bachelor's degree in Pharmaceutical Sciences (BSPS) provides a **strong foundation** in the basic and pharmaceutical sciences with **signature courses** and a **research project**. 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 perspectives and empathy

2. Critical Thinking and Analysis

A BSPS student applies 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 Clarkson University, the BSPS/JD with Albany Law School, the BSPS/MS with ACPHS, and the PA program with Albany Medical College.

BS IN PHARMACEUTICAL SCIENCES REQUIRED COURSES

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: 30 REQUIRED CREDITS
General Chemistry I and II (4,4)
Organic Chemistry I and II (4,4)
College Physics I or Physics for Life Sciences (4)
Elementary Statistics (3)
Calculus I (4)
Pharmaceutics I or Molecular Foundations of Drug Action (3)

COMMUNICATIONS AND HUMANITIES: 12 REQUIRED CREDITS
The Pre-Modern World, The Modern World, The Contemporary World (3,3,3)
ANY Psychology or Sociology course (3)

INTERDISCIPLINARY SIGNATURE COURSEWORK: 16 REQUIRED CREDITS
Scientific Reasoning and Analysis 1, 2, 3 (2, 2, 2)
Survey of Pharmaceutical Sciences (1)
Thesis 1, 2 (3, 3) OR Capstone (3) plus 3 elective credits

TOTAL REQUIRED COURSES: 86 CREDITS

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

1. Directed Electives (minimum of 28 credits): 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 math or science course closely related to the student's academic and career goals.

2. Humanities Electives (minimum of 9 credits): Liberal arts electives include art, music, sociology, ethics, history, psychology, anthropology, foreign language, political science, economics, and English.

3. General Education Electives (minimum of 8 credits): General education electives are any courses that are not required in the standard curriculum.

TOTAL ELECTIVES: 45 CREDITS

TOTAL CREDITS (REQUIRED + ELECTIVE): 126 CREDITS

SAMPLE BSPS CURRICULUM

	Fall 1	Credits			Spring 1	Credits
BIO101	General Biology I	4		BIO102	General Biology II	4
CHE101	General Chemistry I	4		CHE102	General Chemistry II	4
HUM110	The Pre-Modern World	3		HUM120	The Modern World	3
PSC110	Scientific Reasoning and Analysis I	2		PSC111	Scientific Reasoning and Analysis II	2
PSC115	Survey of Pharmaceutical Sciences	1		PSY/SOC	Psychology or Sociology	3
	Total	16			Total	16

	Fall 2	Credits			Spring 2	Credits
CHE211	Organic Chemistry I	4		CHE221	Organic Chemistry II	4
PHY212	College Physics I	4		MAT145	Elementary Statistics	3
HUM210	The Contemporary World	3		DIR	Directed Elective/Elective	7
MAT121	Calculus I	4		GEN	General/Humanities Elective	3
PSC112	Scientific Reasoning and Analysis III	2				
	Total	17			Total	17

	Fall 3	Credits			Spring 3	Credits
PSC311	Biochemistry	3		PSC312	Molecular Biology	3
PSC321	Physiology/Pathophysiology I	4		PSC322	Physiology/Pathophysiology II	4
PSC341*	Pharmaceutics I	3		PSC369*	Molecular Foundations of Drug Action	3
GEN	General/Humanities Elective	3		DIR	Directed Elective/Elective	6
	Total	13			Total	16
*NOTE: Students are required to take either PSC341 OR PSC369.						

	Fall 4	Credits			Spring 4	Credits
PSC431	Foundations of Pharm. Science	2		PSC411	Thesis II	3
PSC410	Thesis 1	3		DIR	Directed Elective	9
GEN	General/Humanities Elective	5		GEN	General/Humanities Elective	2
DIR	Directed Elective	6				
	Total	17			Total	14

SAMPLE BS IN PHARMACEUTICAL SCIENCES CURRICULUM – PRE-HEALTH FOCUS

Pre-Health Courses are highlighted in yellow

	Fall 1	Credits			Spring 1	Credits
BIO101	General Biology I	4		BIO102	General Biology II	4
CHE101	General Chemistry I	4		CHE102	General Chemistry II	4
HUM110	The Pre-Modern World	3		HUM120	The Modern World	3
PSC110	Scientific Reasoning and Analysis I	2		PSC111	Scientific Reasoning and Analysis II	2
PSC115	Survey of Pharmaceutical Sciences	1		PSY/SOC	Psychology or Sociology	3
	Total	16			Total	16

	Fall 2	Credits			Spring 2	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		MAT145	Elementary Statistics	3
MAT121	Calculus I	4		DIR	Directed Elective/Elective	3
PSC112	Scientific Reasoning and Analysis III	2		GEN	General/Humanities Elective	3
	Total	17			Total	17

	Fall 3	Credits			Spring 3	Credits
PSC311	Biochemistry	3		PSC312	Molecular Biology	3
PSC321	Physiology/Pathophysiology I	4		PSC322	Physiology/Pathophysiology II	4
PSC341*	Pharmaceutics I	3		PSC369*	Molecular Foundations of Drug Action	3
GEN	General/Humanities Elective	3		DIR	Directed Elective/Elective	6
	Total	13			Total	16
*NOTE: Students are required to take either PSC341 OR PSC369.						

	Fall 4	Credits			Spring 4	Credits
PSC431	Foundations of Pharm. Science	2		PSC411	Thesis II	3
PSC410	Thesis 1	3		DIR	Directed Elective	9
DIR	Directed Elective	6		GEN	General/Humanities Elective	2
GEN	General/Humanities Elective	5				
	Total	17			Total	14

SAMPLE BS and MS IN PHARMACEUTICAL SCIENCES CURRICULUM – DUAL DEGREE

Courses Highlighted in Red Text are graduate-level courses used for both BS and MS degrees

	Fall 1	Credits			Spring 1	Credits
BIO101	General Biology I	4		BIO102	General Biology II	4
CHE101	General Chemistry I	4		CHE102	General Chemistry II	4
HUM110	The Pre-Modern World	3		HUM120	The Modern World	3
PSC110	Scientific Reasoning and Analysis I	2		PSC111	Scientific Reasoning and Analysis II	2
PSC115	Survey of Pharmaceutical Sciences	1		PSY/SOC	Psychology or Sociology	3
	Total	16			Total	16

	Fall 2	Credits			Spring 2	Credits
CHE211	Organic Chemistry I	4		CHE221	Organic Chemistry II	4
PHY212	College Physics I	4		MAT145	Elementary Statistics	3
HUM210	The Contemporary World	3		GEN	General/Humanities Elective	9
MAT121	Calculus I	4				
PSC112	Scientific Reasoning and Analysis III	2				
	Total	17			Total	16

	Fall 3	Credits			Spring 3	Credits
PSC311	Biochemistry	3		PSC312	Molecular Biology	3
PSC321	Physiology/Pathophysiology I	4		PSC322	Physiology/Pathophysiology II	4
PSC341*	Pharmaceutics I	3		PSC369*	Molecular Foundations of Drug Action	3
GEN	General/Humanities Elective	3		GEN	General/Humanities Elective	3

PSC410	Thesis I	3		PSC411	Thesis II	3
	Total	16-19			Total	13-16
*NOTE: Students are required to take either PSC341 OR PSC369.						

	Fall 4	Credits			Spring 4	Credits
PSC631G	Foundations of Pharm. Science	3		PSC	CORE MSPS Specialization Course	3
PSC672G	Experimental Design and Data Analysis	2		GRAD	Graduate Elective (UG DIR Elective)	3
ETH610	Ethics in Research	1		DIR	Directed Elective	6
DIR	Directed Elective	6		PSC651G	Pharm Sci Journal Club	1
PSC661G	Research Rotation	2		PSC761G	(Graduate) Thesis Research	2
PSC651G	Pharm Sci Journal Club	1		GEN	General Elective	5
	Total	15			Total	17
	Fall 5	Credits			Spring 5	Credits
PSC	CORE MSPS Specialization Course	3		GRAD	Graduate Elective	6
GRAD	Graduate Elective	3		PSC761G	(Graduate) Thesis Research	3
PSC761G	(Graduate) Thesis Research	3				
	Total	9			Total	9

BACHELOR OF SCIENCE in PHARMACEUTICAL SCIENCES 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

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	4 semester hours
Calculus I	4 semester hours
Statistics	3 semester hours
English	9 semester hours
Directed elective	9 semester hours
Liberal Arts electives	6 semester hours

Humanities electives include fine arts, music, history, philosophy, religion, foreign language, and English. General Education electives include any course that is not required in the standard curriculum list above.

Directed electives include any non-required math or 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.

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 (51 credits) and the free electives (18 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 Medical Humanities (equivalent) (3)
COM 101: Academic Reading and Writing or equivalent (3)
COM 120: Public Speaking (3)
COM 250: Persuasion (3)

Social Sciences (12 credits)
SOC 101: Introduction to Sociology (3)
PSY 101: General Psychology (3)
PBH 245: Introduction to Health Systems (3)
PBH 200: Public Health Problems (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 or College-Level Math (4)
PBH 210/211: Introduction to Data/Data Lab (4)
PBH 230: Statistics for Public Health (3)

Professional Development (5 Credits)
PBH 102 First Year Experience (1)
PBH 225: Seminar in Health Professions (1)
PBH 401: Capstone (3)

Public Health Core: 51Credit Hours
COM 315: Health Campaigns (3)
ETH 310: Bioethics (3)
SOC 301: Research Methods (3)
ETH 320: Research Ethics Workshop (1)
PBH 320: Geography of Health (3)
PBH 335: Determinants of Health (3)
PBH 345: Community Health Practice (3)
PBH 350: Epidemiology (3)
PBH 365: Service Learning Experience (1,1)
PSY 321 or COM 312: Health Promotion (3) or Health Psychology (3)
PBH 120: Intro to Public Health (3)
SOC 335: Global Health (3)
SOC 420: Health and Social Policy (3)

Applied Biological Science Selective (3)

One course chosen from: BHS 360: Clinical Anatomy, BIO 213: Anatomy and Physiology I, BIO 215: Anatomy and Physiology II, BIO 225: Genetics, BIO 260: Public Health Toxicology, or Permission of Program Director

Applied Research Methods Selective (3)

One course chosen from: COM 350 Qualitative Research Methods, PBH 340 Survey Research Methods, SOC 360 Medical Anthropology; PBH 360 Field Epidemiology, or Permission of Program Director

Critical Reflection Selective (3):

One course chosen from: ETH 315 Health, Disease, and Authority, LIT 220 Suicide and Madness, SOC 325 Medical Sociology, PSY 440 Death and Dying, or Permission of Program Director

Culture and Communication Selective (3):

One course chosen from: COM 320 Patient-Provider Communication, COM 330 Intercultural Communication in Health Care, HUM 320 Graphic Medicine, PBH 318 Health Teamwork, PHI 350 Nature and Wellness, SOC 330 Culture of Disability, ; or Permission of Program Director

Health Care Systems Selective (3)

One course chosen from: COM 320 Patient-Provider Communication, ECN 317 Health Economics, HIS 330 History of Public Health and Medicine, SOC 325 Medical Sociology;;; or Permission of Program Director

Free Electives: 18 Credit Hours

[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
PBH 120	Intro to Public Health	3			
BSS 102	Seminar in Health Professions	1	PBH 200	Public Health Problems	3
	Total	17		Total	16

Year 2					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
HUM 201 Or HUM 220	Contemporary World Or Medical Humanities	3	COM 250	Persuasion	3
PBH 230	Statistics for Public Health	3	PBH 245	Intro to Health Systems	3
SOC 335	Global Health	3	PBH 210/ PBH 211	Intro to Data	4
MAT 121	Calculus I	4		Applied Biological Science Selective [Multiple to Choose from]	3
	Elective	3	PBH 220	Environmental Health	3
			PBH 225	Seminar in Health Professions	1
	Total	16		Total	17

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 320	Research Ethics Workshop	1		Health Care Systems Selective	3
PBH 335	Determinants of Health	3	COM 312 or PSY 321	Health Promotion or Health Psychology	3
PBH 365	Service Learning Experience	1	PBH 365	Service Learning Experience	1
PBH 350	Epidemiology	3		Elective	3
	Total	14		Total	16

Year 4					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
SOC 420	Health and Public Policy	3	PBH 401	Capstone or Elective	3
COM 315	Health Campaigns	3	PBH 345	Community Health Practice	3
	Elective	3		Critical Reflection Selective	3
	Culture and Communication Selective	3		Elective	3
	Capstone or Elective	3		Elective	3
	Total	15		Total	15

Total Credits: 126

BACHELOR'S PROGRAMS

PRE-MED

At ACPHS, you also have the flexibility to choose among three bachelor's degree programs as you pursue your Pre-Med Studies. And don't worry about the choice of program affecting your chances for being a successful medical school applicant. In the past two years, ACPHS students from each of these three programs have been accepted to medical school.

JOINT DEGREES
B.S. IN MICROBIOLOGY
B.S. IN PHARMACEUTICAL SCIENCES
B.S. IN PUBLIC HEALTH

PRE-MED COURSE GUIDELINES

Our Pre-Med course guidelines have been developed to fulfill the academic requirements for admission to the majority of medical schools and can be easily integrated into the curricula of our bachelor's programs. The guidelines also include a list of courses recommended for MCAT preparation. As some requirements vary by institution, you are encouraged to consult the medical schools you wish to apply in order to ensure you meet all of your desired school's prerequisite requirements. Should you have any questions, you can always reach out to your academic or faculty advisor.

HOW WE HELP YOU GET THERE

The College's Medical Professions Advisory Committee (MPAC) is here to provide support on your medical school journey. The Committee will help guide you through the application process and assist with the review and organization of your core application materials such as your resume, personal statement, and letters of reference. Application for MPAC assistance typically takes place 1 ½ years before you are set to graduate. The College's American Medical Student Association chapter offers additional support by arranging meetings with physicians, organizing visits to regional medical schools, and helping facilitate hands-on experiences. Students enrolled in any of the Bachelor's programs at the College have the opportunity to apply to for early admission to the Albany Medical College M.D. program (7 years). Similarly, students interested in applying for early admission to D.O. programs (7 or 8 years) at LECOM or NYIT can also apply for early admission while enrolled at ACPHS.

STAND OUT WITH RESEARCH EXPERIENCE

Medical school is extremely competitive, and while have a strong GPA is important, you can distinguish yourself as a top candidate through research experience. Research is a core component of academic life at ACPHS, and the size of our school means opportunities are available for students to get involved with research as early as their first year. Whether you wish to do traditional lab-based research, analyze population health data, or something in between, there's a strong chance we can connect you with a faculty mentor on campus or leverage the College's expansive network of affiliates to help find you an opportunity with one of our heath care or corporate partners.

BACHELOR'S PROGRAMS

PRE-PA

A Physician Assistant (PA) is a nationally certified and state-licensed health care professional who practices and prescribes medicine in coordination with physicians and other providers. To practice as a PA, you need a qualifying bachelor's degree followed by a master's degree in Physician Assistant Studies. The two degrees typically take a combined six years to complete. This is an exciting time for PAs as they are being granted additional responsibilities due to physician shortages around the nation. Their increasing importance to the health care team is also being reflected in their salaries. According to job site glassdoor.com, PAs are the 7th highest paid professionals in America with average base salaries of $112,000/year. Our Pre-Physician Assistant Studies coursework allows you to earn your B.S. degree from one of four programs at ACPHS while preparing you for admission into the PA program of your choice.

GET ACCEPTED TO A PA PROGRAM AS A FRESHMAN

Our academic affiliation with Albany Medical College - which is literally across the street from ACPHS - provides you with an opportunity to be accepted into Albany Medical College's Physician Assistant Studies program BEFORE THE START of your freshmen year. Students who pursue this option are interviewed by representatives of ACPHS and Albany Medical College prior to enrolling as freshmen. If they successfully pass the interview, there is a seat reserved for them in the PA program upon their graduation from ACPHS, provided they maintain a minimum GPA of 3.2 for each semester and gain the required health related experience. The Graduate Record Examination (GRE) is waived for qualified students in this program.

HOW WE HELP YOU GET THERE

Our bachelor's degree programs in Biomedical Technology, Microbiology, Pharmaceutical Sciences, and Public Health will equally prepare you for any PA program with robust curricula that are focused on the study of human health.

B.S. IN BIOMEDICAL TECHNOLOGY
B.S. IN MICROBIOLOGY
B.S. IN PHARMACEUTICAL SCIENCES
B.S. IN PUBLIC HEALTH

STAND OUT WITH RESEARCH

Pre-Physician Assistant programs are extremely competitive, and while having a strong GPA is important, you can distinguish yourself as a top candidate through research experience. Research is a core component of academic life at ACPHS, and the size of our school means opportunities are available for students to get involved with research as early as their first year. Whether you wish to do traditional lab-based research, analyze large sets of health outcomes data, or something in between, there's a good chance we can connect you with a faculty mentor on campus. And if there is not someone at the College doing research in your area of interest, we can leverage the College's expansive network of affiliates to see if we can find an opportunity for you with one of our heath care or corporate partners.

BACHELOR'S PROGRAMS

PRE-HEALTH PATHWAYS

PREPARING STUDENTS FOR GRADUATE SCHOOL SUCCESS

If graduate school is in your future, what better place to prepare yourself than a college where all of the academic programs are grounded in science and focused on human health? We support students who wish to pursue pre-med, pre-PA, pre-dental, pre-vet and many other disciplines.

Below are a few examples of students from ACPHS who took their next academic step at highly-regarded graduate programs across the country.

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 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.

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**

PRE-PHARMACY

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**

PRE-PHARMACY

SCIENCE SELECTIVE INFORMATION

Fall Offerings	Prerequisites
Anatomy and Physiology I	General Biology I and II
Biological Basis of Disease	General Biology I and II
Epidemiology	
Clinical Anatomy	General Biology I and II
Genetics	General Biology I and II

Spring Offerings	Prerequisites
Anatomy and Physiology II	General Biology I and II
Cell Biology	General Biology I and II
Virology	Microbiology
Parasitology	Microbiology
Calculus II	Calculus or Calculus I

Pharm.D. Fall Start Date Curricular Grid

2021-2022 Fall - Spring					
Fall Semester		Credits	Spring Semester		Credits
PSC341	Pharmaceutics I	3	PSC 342	Pharmaceutics II	3
PSC321	Physiology/Pathophysiology	4	PSC322	Physiology/Pathophysiology II	4
CHE 311 or PSC 311	Biochemistry	3	PSC312	Molecular Biology	3
PSC 315	Immunology	3	PHM329	Self-Care/OTC	3
PHM 318	Foundations of Pharmacy	2	PSL332	Pharmacy Skills II	2
PSL 331	Pharmacy Skills I	2		APhA Immunization Certificate	
			PSC369	Molecular Foundations of Drug Action I	3
	TOTAL	17		TOTAL	18

2022 Summer		
Summer Semester		Credits
CLK798	Community	4
	TOTAL	4

2022-2023 Fall – Spring					
Fall Semester		Credits	Spring Semester		Credits
PSC370	Pharmacogenomics	2	PTP425	PTP&M Endocrine	2
PSC441	Pharmacokinetics	3	PTP431	PTP&M GI/Nutrition 2	2
PTP440	PTP&M – Cardiovascular	4	PTP446	PTP&M Infectious Disease	4
PTP410	PTP&M – Respiratory Disease	1	PAD451	US and Global Health Care Systems	3
PTP4XX	Drug Information and Literature Evaluation	3	IPS402	Integrated Problem Solving Workshop IV	1
IPS401	Integrated Problem Solving Workshop III	1	PSL432	Pharmacy Skills IV	2
PSL431	Pharmacy Skills III	2		Professional Elective	3
	Professional Elective*	3			
	TOTAL	15-19		TOTAL	14-18

2023 Summer		
Summer Semester		Credits
CLK807	Institutional	3
CLK803	Team Based Care	1
	TOTAL	4

2023-2024 Fall - Spring

Fall Semester		Credits	Spring Semester		Credits
PTP525	PTP&M – Nephrology/Toxicology	2	PTP515	PTP&M Rheumatology/Oncology	3
PTP528	PTP&M – Genitourinary	2	PAD510 or 511	Jurisprudence	3
PTP549	PTP&M – Neurology/Psychology	4	ETH510	Health Care and Human Values	3
IPS501	Integrated Problem Solving Workshop V	1	PAD521	Pharmacy Administration	3
PAD515	Pharmacoeconomics and Health Policy	3	IPS502	Integrated Problem Solving Workshop VI	2
PSL531	Pharmacy Skills V	2	PSL532	Pharmacy Skills VI	1
PHM911	Orientation to APPE	No credit		Professional Elective*	3
PSC451	Professional Elective*	3			
	TOTAL	14-17		TOTAL	15-18

2023-2024 Advanced Pharmacy Practice Experiences - Summer, Fall And Spring Semesters		
CLK8929	Community Core Rotation	6
CLK843 or 930	Institutional Core Rotation	6
CLK843 or 930	Institutional Core Rotation	6
CLK812 or 999	Inpatient Core Rotation	6
CLK812 or 999	Ambulatory Core Rotation	6
	Flexible Core Rotation	6
	Elective	6
	Elective	6
	TOTAL	42

3-YEAR PHARMACY/ACCELERATED

Summer 1 - 10 Weeks		Credits	Fall 1 - 15 Weeks		Credits
	Pharmacy Skills 1	2		Pharmacy Skills 2	3
	Pharmaceutics 1	3		Molecular Biology	3
	Biochemistry	3		Physiology/Pathophysiology 2	4
	Physiology/Pathophysiology 1	4		Pharmaceutics 2	3
	Drug Information/Biostatistics	2		Immunology	3
	Integrated Problem Solving (IPS) Workshop 1	1		Foundations of Pharmacy	1
				Pharmacogenomics	2
				Integrated Problem Solving (IPS) Workshop 2	1
	Total	15		**Total**	20

3-YEAR PHARMACY/ACCELERATED

Spring 1- 15 Weeks		Credits	Summer 2 - 15 Weeks		Credits
	Pharmacy Skills 3	2		CLK-800 Community IPPE	4
	Pharmacokinetics	3		CLK 803 Team-Based Care IPPE	1
	Integrated Problem Solving (IPS) Workshop 3	1		CLK 802 Institutional IPPE	3
	Molecular Foundations of Drug Action	3		PTP&M – Respiratory Disease	1
	US and Global Health Care Systems	3			
	Self Care/OTC	3			
	PTP&M – Infectious Disease	4			
	PTP&M - GI/Nutrition	2			
	Total	21		**Total**	9

3-YEAR PHARMACY/ACCELERATED

Fall 2 - 15 Weeks	Credits	Spring 2 - 15 Weeks	Credits
Integrated Problem Solving (IPS) Workshop 4	1	Integrated Problem Solving (IPS) Workshop 5	2
Scientific Literature Evaluation	1	Pharmacy Skills 5	1
PTP&M – Cardiovascular	4	Pharmacoeconomics and Health Policy	3
PTP&M – Genitourinary	2	Jurisprudence	3
PTP&M – Neurology/Psychology	4	Pharmacy Administration	3
Pharmacy Skills 4	3	PTP&M - Rheumatology/Oncology	3
Orientation to APPE	0	PTP&M – Endocrine	2
Professional Elective	3	Professional elective	3
Total	19	**Total**	20

Module A - 6 Weeks	Credits		
ETH 510 Health Care and Human Values	3		
PPT 525 PPT&M - Nephrology/Toxicology	2		
Total	5		

Academic Minor

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 a minimum of 18 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.
- Coursework 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 minimum of 6 credits must be provided by non-required courses of the program (free electives/professional electives/bioselectives/directed electives/liberal arts electives are not considered required courses for the purposes of Minor completion.
- 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 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."

MATHEMATICS MINOR

MEDICAL HUMANITIES MINOR

MICROBIOLOGY MINOR

PRE-MED MINOR

PUBLIC HEALTH MINOR

One Year Post Bac Program (FALL START)

Year 1						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
BIO 625	Advanced Molecular Biology	3		BIO 620	Advanced Cell Biology	3
MAT 610	Statistical Inference and Modeling	3		BIO 680	Bacterial Pathogenesis	3
BIO 610/ 627	Immunology#	3		PAD 693	Epidemiology	3
BIO 660	Journal Club	1		BIO 660	Journal Club	1
HIS 530	History of Public Health and Medicine in the United States	3		PSC 625	Applied and Clinical Biochemistry	3
	Bioselective*	3		ETH 510	Healthcare and Human Values	3
PPP 670	Prep for Health Professions I	1		PPP 680	Prep for Health Professions II	1
	Total	**17**			**Total**	**17**

Summer Semester		**Credits**
BIO 665	Capstone Thesis	3
	Total	**3**

TOTAL: 37 credits

*Bioselective Course- Students must select one course from the following courses:

- Genetics & Molecular Basis of Disease
- Infectious Disease Pharmacology
- Public Health Microbiology
- Clinical Microbiology I
- Clinical Microbiology II
- Hematology and Hemostasis
- Viral Pathogenesis

Post Bac Students who have completed UG Immunology coursework may choose to take BIO 627 Innate Immunology in place of BIO 610 Immunology.

One Year Post Bac Program (SPRING START)

Year 1						
Spring Semester		**Credits**		**Summer Semester**		**Credits**
BIO 620	Advanced Cell Biology	3		BIO 665	Capstone Thesis**	3
BIO 680	Bacterial Pathogenesis	3				
HOI 645	Epidemiology	3				
BIO 660	Journal Club	1				
PSC 500	Applied and Clinical Biochemistry	3				
ETH 510	Healthcare and Human Values	3				
PPP 680	Prep for Health Professions II	1				
	Total	**17**			**Total**	**3**

Fall Semester		**Credits**
BIO 625	Advanced Molecular Biology	3
MAT 610	Statistical Inference and Modeling	3
BIO 610/ 627	Immunology#	3
BIO 660	Journal Club	1
HIS 530	History of Public Health and Medicine in the United States	3
	Bioselective*	3
PPP 670	Prep for Health Professions I	1
	Total	**17**

TOTAL: 37 credits

*Bioselective Course- Students must select one course from the following courses:

- Genetics & Molecular Basis of Disease
- Infectious Disease Pharmacology
- Public Health Microbiology
- Clinical Microbiology I
- Clinical Microbiology II
- Hematology and Hemostasis
- Viral Pathogenesis

Program Students who have completed UG Immunology coursework may choose to take BIO 627 Innate Immunology in place of BIO 610 Immunology.

** Design and research of the Capstone Project will occur in the summer semester. The Capstone Thesis writing and presentation will be completed in the fall semester.

MS BIOMANUFACTURING AND BIOPROCESSING

PSM in Biomanufacturing and Bioprocessing Course Grid					
Term: FALL			**Term: SPRING**		
Course Number & Title	**Credits**	**Prerequisite(s)**	**Course Number & Title**	**Credits**	**Prerequisite(s)**
BIO648G, Microbial Fermentation **ACPHS/CBET at NanoFab East**	3	General Biology I & II, Microbiology	BIO631G, Mammalian Cell Culture **ACPHS/CBET at NanoFab East**	3	General Biology I & II
PSC610G, Technical Writing for the Biopharmaceutical Industry – **Online**	2	None	PSC620G, Downstream Processing of Biopharmaceutical Products **ACPHS/CBET at NanoFab East**	3	Biochemistry
PSC646G, Regulatory Science – **Online**	3	Foundations of Pharmaceutical Science	PSC625G, Applied and Clinical Biochemistry **ACPHS Main Campus**	3	Biochemistry
MAT610G, Statistical Inference and Modeling **ACPHS Main Campus**	3	None	BIO641G, Current Topics in Biopharmaceutical Technology – **Online**	3	TBD
Elective: 1. PHM624G, Pharmaceutical and Biopharmaceuticals Industry Entrepreneurship – **Online** *or* 2. Upper Level BIO or PSC Course	3	1. None 2. TBD	BIO655G, Pharmaceutical Microbiology **ACPHS/CBET at NanoFab East**	3	General Biology I & II, Microbiology
ETH610G, Ethics in Research – **Online**	1	None			
Term credit total:	**15**		**Term credit total:**	**15**	
Term: SUMMER					
Course Number & Title	**Credits**	**Prerequisite(s)**			
BIO675G, Biopharmaceutical Capstone	3	None			
Experiential Learning – *e.g.*, Internship	0	None			
Term credit total:	**3**				

MS CLINICAL LAB SCIENCES

Graduate Year 1 (G1)

X	#	Course name	cr		X	#	Course name	cr
	CLS610	Clinical Microbiology I	4			CLS620	Clinical Microbiology II	4
	CLS650	Clinical Hematology and Hemostasis	4			CLS640	Clinical Chemistry	4
	CLS655	Urinalysis and Body Fluids	2			CLS660	Immunohematology	4
	PSC672	Experimental Design and Data Analysis	2			CLS630	Clinical Immunology	4
	ETH610	Ethics in Research	1			BIO650	Research Design	2
		Total	13				Total	18

Graduate Year 2 (G2)

X	#	Course name	cr		X	#	Course name	cr
	CLS770	Clinical Practicum I	9			CLS780	Clinical Practicum II	9
	BHS745	Molecular Diagnostics w/lab	4			CLS760	Clinical Correlations	3
	BHS730	Advanced Good Laboratory Practices/Laboratory Management	3			BHS740	Genetics and Molecular Basis of Disease	3
						BHS790	Capstone	3
		Total	16				Total	18

Total Credit Hours = **65**

MS CYTOTECHNOLGY AND MOLECULAR CYTOLOGY

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Course Name**	**Credits**		**Code**	**Course Name**	**Credits**
CYT 610	Cytopathology of the 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
BHS730	Advanced Good Laboratory Practices/Lab Management	3		BHS 740	Genetics and Molecular Basis of Disease	3
BHS 745	Molecular Diagnostics with Lab	4		BHS 765	Grand Rounds in Pathology	1
PSC 672	Experimental Design and Data Analysis	2		BIO 650	Research Design	2
ETH 610	Ethics in Research	1				
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-Fine Needle Aspiration Portfolio	3
BHS 755	In Situ Hybridization-Principles, Protocols 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				

- The cytotechnology program is a condensed MS program: 5 consecutive semesters/sessions
- Students complete the program in 1 ½ years (18 months) and graduate in December
- The cytotechnology students must complete two clinical rotations:
  - Clinical Rotation I (summer session II): 7 weeks in duration
  - Clinical Rotation II (second fall semester): 12 weeks in duration
- Clinical rotations are at local and distant medical centers/labs
- The cytotechnology program has ~ 40 clinical affiliation sites

M.S. MOLECULAR BIOSCIENCES

The MS in Molecular Biosciences is a 33 credit, 24-month degree program designed to educate students in the basic mechanisms of human health and disease. The program is interdisciplinary, bringing together basic, applied, and clinical scientists from a number of departments to provide students with foundational didactic coursework and the opportunity to explore basic and clinically relevant scientific questions in the laboratory (Thesis track) or an industrial setting through experiential learning (Capstone track). The program encompasses a broad range of disciplines, including molecular genetics, cell biology, microbiology, immunology, and infectious diseases. The program offers courses in the core biomedical disciplines, laboratory research techniques, ethical conduct of science, and a graduate seminar course.

The program has two tracks: Thesis track and Capstone track. The Thesis track emphasizes the importance of high quality research and is designed to assist students in fulfilling their potential as research scientists. It requires the completion of original research and publication of a thesis describing that research. The Capstone Track provides students with co-operative experiential learning opportunities (Co-op) in biopharmaceutical industry, federal or state public health labs, or clinical research laboratories to gain skills and knowledge required for seeking employment in these sectors. The Capstone course serves as a culminating part of this track and requires the production of a written document based on 1) literature review on an existing scientific topic or 2) a no-credit experiential learning experience such as a co-op, internship, or basic/clinical lab research.

The graduates from this program can have careers that involve research by government agencies, research centers, non-profit organizations, industry, colleges and universities. It also prepares students for advanced degrees in the microbiology, immunology, molecular and cell biology, and medicine.

Upon successful completion of the program, students will:

- Obtain broad knowledge through courses, laboratory, and the scientific literature in the field of molecular biosciences
- Demonstrate skills to conduct independent original research in a specialized area of molecular biosciences or work on real-world problems in the biopharmaceutical industry
- Demonstrate the ability to organize and effectively communicate oral and written scientific information
- Develop the skills to be competitive for jobs in academia and industry
- Develop the skills to be competitive for graduate or professional programs

M.S. MOLECULAR BIOSCIENCES REQUIRED COURSES

Core Requirements: 12 required credits
BIO 625: Advanced Molecular Biology (3)
BIO 630: Advanced Cell Biology (3)
MAT 610: Statistical Inference and Modeling (3)
ETH 610: Ethics in Research (1)
BIO 650: Research Design (2)

Thesis Track:
BIO 670: Research Rotation (2)
BIO 701/702: Thesis Research (6)
BIO 660: Journal Club (1)
Electives (12)

Capstone Track:
BIO 665: Molecular Biosciences Capstone (4)
BIO 660: Journal Club (2)
Electives (15)

Total Credits: 33

M.S. MOLECULAR BIOSCIENCES ELECTIVE COURSES

Students wanting to specialize in any of the areas listed below should take electives within the color coded group.

Red- Biomedical Microbiology;
Blue- Biochemistry, Cancer Biology, Molecular & Cell Biology;
Green- Clinical Microbiology
Pink- Epidemiology, Public Health Microbiology, Courses at SUNY Albany with permission of PD
Brown- Industrial Microbiology

GRADUATE ELECTIVES		
Code	**Course Name**	**Credits**
BIO 620	Advanced Topics in Microbiology	3
BIO 627	Innate Immunology	3
BIO 610	Immunology	3
BIO 690	Viral Pathogenesis	3
BIO 680	Bacterial Pathogenesis	3
BIO 635	Cell Death and Disease	3
PSC 635	Pharmacological Regulation of Signal Transduction	3
PSC 733	Pharmacology and Molecular Genetics of Cancer	3
PSC 625	Clinical Biochemistry	3
CLS 610	Clinical Microbiology I	4
CLS 620	Clinical Microbiology II	4
BHS 740	Genetics and Molecular Basis of Disease	3
BHS 745	Molecular Diagnostics	3
BHS 750	Flow Cytometry	3
BIO 615	Public Health Microbiology	3
PAD 693	Epidemiology	3
BIO 648	Microbial Fermentation	3
BIO 631	Mammalian Cell Culture	3
BIO 655	Pharmaceutical Microbiology	3
BIO 641	Current Topics in Biopharmaceutical Technology	3
PSC 620	Downstream Processing of Biopharmaceutical Products	3
PSC646G	Regulatory Science	3

M.S. MOLECULAR BIOSCIENCES THESIS TRACK SAMPLE SCHEDULE

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
BIO 625	Advanced Molecular Biology	3		BIO630	Advanced Cell Biology	3
ETH 610	Ethics in Research	1		BIO 650	Research Design	2
MAT 610	Statistical Inference and Modeling	3		BIO 660	Journal Club	1
BIO 670	Research Rotation	2			Elective 1	3
					Elective 2	3
Total Credits		**9**		**Total Credits**		**12**

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
	Elective 3	3			Elective 4	3
BIO 701	Thesis Research	3		BIO 702	Thesis Research	3
Total Credits		**6**		**Total Credits**		**6**

*Requires completing Thesis Research after Years 1& 2.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

#All Master's students are encouraged to attend Journal club every semester.

M.S. MOLECULAR BIOSCIENCES CAPSTONE TRACK SAMPLE SCHEDULE

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
BIO 625	Advanced Molecular Biology	3		BIO 650	Research Design	2
ETH 610	Ethics in Research	1		BIO 630	Advanced Cell Biology	3
MAT 610	Statistical Inference and Modeling	3			Elective 2	3
BIO 660	Journal Club (G-1)	1			Elective 3	3
	Elective 1	3				
Total Credits		**11**		**Total Credits**		**11**

YEAR 2 FALL				YEAR 2 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
	Elective 4	3			Experiential Learning	0
	Elective 5	3		BIO 665	Molecular Biosciences Capstone Course*	4
BIO 660	Journal Club (G-2)	1				
Total Credits		**7**		**Total Credits**		**4**

*May require completing Capstone Course after Years 1 & 2.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

#All Master's students are encouraged to attend Journal club every semester.

ACPHS B.S. Microbiology (Biomedical Track) 3.5-year Schedule for Albany Medical College Physician Assistant Joint Degree Program:

# 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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
PSY 101	Elective 1 (Gen Psych.)	3	SOC 101	Elective 2 (Intro to Soc.)	3
	Total	**17**		**Total**	**18**
Summer Session I	**College Physics I**	**4**	**Summer Session II**	**College Physics II**	**4**

Year 2					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
CHE 211	Organic Chemistry I	4	CHE 221	Organic Chemistry II	4
BIO 213	Track Elect. 1 (A&PI with lab)	4	BIO 215	Track Elect. 2 (A&PII with lab)	4
HUM 201	The Contemp. World	3	MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4	BIO 240	Virology	3
	Elective 3 (English)	3	BIO 235	Cell Biology	3
	Total	**18**		**Total**	**17**

Year 3					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PSC 311	Biochemistry	**3**	BIO 680	Bacterial Pathogenesis	3
BIO 370	Microbial Physiology	3	BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3	BIO 355	Biomedical Lab Techniques II	3
PSC 315	Immunology	3	BIO 365	Mycology & Parasitology	3
	Elective 4	3	BIO 345	Journal Club	1
			BIO 480	Micro. Capstone Experience I	3
	Total	**15**		**Total**	**16**

Year 4	
Fall Semester	**Credits**

BIO 253	Scientific Communication	2
BIO 345	Journal Club	1
BIO 485	Micro. Capstone Exp. II	3
	Elective 5	3
	Elective 6	3
	Elective 7	3
	Total	**15**

Courses in Red: Required by Albany Medical College

First Year students can elect to take SEA-PHAGE sequence (BIO 145 & 146) in Fall and Spring semesters if they have transferred elective credits or plan to complete their Social & Behavioral Science electives over summer.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Infectious Disease Epidemiology Track) 3.5-year Schedule for Albany Medical College Physician Assistant Joint Degree Program:

# 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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
PSY 101	Elective 1 (Gen Psych.)	3		SOC 101	Elective 2 (Intro to Soc.)	3
	Total	**17**			**Total**	**18**

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 201	The Contemp. World	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 235	Cell Biology	3
PBH 120	Intro to Public Health	3			Elective 3 (English)	3
	Total	**18**			**Total**	**17**

Year 3					
Fall Semester		**Credits**		**Spring Semester**	**Credits**
PSC 311	Biochemistry	**3**	BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3	BIO 355	Biomedical Lab Techniques II	3
PSC 315	Immunology	3	BIO 345	Journal Club	1
BIO 315	Public Health Microbiology	3	BIO 480	Micro. Capstone Experience I	3
BIO 213	Track Elect. 1 (A&PI with lab)	4	BIO 215	Track Elect. 2 (A&PII with lab)	4
	Elective 4	3		Elective 5	3
	Total	**19**		**Total**	**17**

Year 4		
Fall Semester		**Credits**
BIO 253	Scientific Communication	2
BIO 345	Journal Club	1
BIO 485	Micro. Capstone Exp. II	3
PBH 350	Epidemiology	3
BIO 370	Microbial Physiology	3
	Elective 6	3
	Elective 7	3
	Total	**18**

Courses in Red: Required by Albany Medical College

First Year students can elect to take SEA-PHAGE sequence (BIO 145 & 146) in Fall and Spring semesters if they have transferred elective credits or plan to complete their Social & Behavioral Science electives over summer.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / LECOM- Accelerated Osteopathic Medicine Program (3+4 Program)

Students can transfer a total of 21 credits back from LECOM to ACPHS in fulfillment of their BS degree requirements. For this program/concentration the following courses will be used.

LECOM Course - to be transferred to ACPHS	ACPHS Course - will satisfy the requirement for the following
Microbiology & Immunology (3 credits)	PSC 315 Immunology (3 credits)
Biochemistry & Genetics (3 credits)	BIO 235: Cell Biology (3 credits)
Anatomy, Embryology, Histology, Physiology (6 credits)	BIO 213 & BIO 215: A&P I &II (6 credits)
Clinical Neuroscience (9 credits)	3 Free Electives (9 credits)

ACPHS Schedule

#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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
PSY 101	Elective 1 (Gen Psych.)	3	SOC 101	Elective 2 (Intro to Soc.)	3
	Total	**17**		**Total**	**18**

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 201	The Contemp. World (Eng. I)	3	MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4	BIO 240	Virology	3
BIO 225	Elective 3 (Genetics)	3		Elective 4 (English II)	3
	Total	**18**		**Total**	**17**

Year 3					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PSC 311	Biochemistry	**3**	BIO 680	Bacterial Pathogenesis	3
BIO 370	Microbial Physiology	3	BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3	BIO 355	Biomedical Lab Techniques II	3
BIO 253	Scientific Communication	2	BIO 365	Mycology & Parasitology	3
BIO 345	Journal Club	1	BIO 345	Journal Club	1

BIO 480	Micro. Capstone Exp. I	3		BIO 485	Micro. Capstone Experience II	3
	Total	**15**			**Total**	**16**

TOTAL: 101 credits; 21 credits from LECOM transferred back to ACPHS = 122 credits

Courses in Red: Required by LECOM

First Year students can elect to take SEA-PHAGE sequence (BIO 145 & 146) in Fall and Spring semesters if they have transferred elective credits or plan to complete their Social & Behavioral Science electives over summer.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / LECOM- Osteopathic Medicine Program (4+4 Program)

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 (Eng 1)	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 235	Cell Biology	3
PSY 101	Elective 2 (Gen Psych.)	3		SOC 101	Elective 3 (Intro to Soc.)	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 240	Virology	3
PSC 315	Immunology	3		BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3		BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3		BIO 355	Biomedical Lab Techniques II	3
	Elective 4 (Genetics)	3			Elective 5 (English 2)	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
BIO 253	Scientific Communication	2		BIO 680G	Bacterial Pathogenesis	3
BIO 345	Journal Club	1		BIO 345	Journal Club	1
	Track Elective I (A&PI)	3			Track Elective II (A&PII)	3

	Elective 6	3			Elective 7	3
	Total	**12**			**Total**	**13**

Courses in Red: Required by LECOM

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / LECOM- School of Dental Medicine Program (4+4 Program)

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 (Eng 1)	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 235	Cell Biology	3
PSY 101	Elective 2 (Gen Psych.)	3		SOC 101	Elective 1 (Intro to Soc.)	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 240	Virology	3
PSC 315	Immunology	3		BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3		BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3		BIO 355	Biomedical Lab Techniques II	3
	Elective 4 (Genetics)	3			Elective 5 (English 2)	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
BIO 253	Scientific Communication	2		BIO 680G	Bacterial Pathogenesis	3
BIO 345	Journal Club	1		BIO 345	Journal Club	1
	Track Elective I (A&PI)	3			Track Elective II (A&PII)	3
	Elective 6	3			Elective 7	3
	Total	**12**			**Total**	**13**

Courses in Red: Required by LECOM

Courses in Blue: Recommended by LECOM

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / NYIT-College of Osteopathic Medicine Program (3+4 Program)

Students can transfer a total of 18 credits back from NYIT to ACPHS in fulfillment of their BS degree requirements. For this program/concentration the following courses will be used.

NYIT Course - to be transferred to ACPHS	**ACPHS Course - will satisfy the requirement for the following**
Immunology (3 credits of COM502)	PSC 315 Immunology (3 credits)
Microbiology (3 credits of LDB 507)	BIO 680 Bacterial Pathogenesis (3 credits)
Biochemistry, Genetics, Histology, Physiology, Pathology (3 credits of LDB 507)	BIO 235: Cell Biology (3 credits)
9 credits of COM502	3 Free Electives (9 credits)

ACPHS Schedule

#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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	**MAT 121**	**Calculus I**	**4**
PSY 101	**Elective 1 (Gen Psych.)**	**3**	**SOC 101**	**Elective 2 (Intro to Soc.)**	**3**
	Total	**17**		**Total**	**18**

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 201	The Contemp.World (Eng)	3	MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4	BIO 240	Virology	3
BIO 225	**Elective 3 (Genetics)**	**3**		Elective 4 (English II)	3
	Total	**18**		**Total**	**17**

Year 3					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PSC311	Biochemistry	**3**	**BIO 215**	**A&P II (Track elective 2)**	**3**
BIO 213	**A&P I (Track elective 1)**	**3**	BIO 340	Microbial Genetics	3

BIO 370	Microbial Physiology	3	BIO 355	Biomedical Lab Tech. II	3
BIO 350	Biomedical Lab Tech. I	3	BIO 235	Med. Mycology & Parasitology	3
BIO 253	Scientific Communication	2	BIO 345	Journal Club	1
BIO 345	Journal Club	1	BIO 485	Micro. Capstone Exp. II	3
BIO 480	Micro. Capstone Exp. I	3			
	Total	**18**		**Total**	**16**

TOTAL: 104 credits; 18 credits from NYIT transferred back to ACPHS = 122 credits

Courses in Red: Required by NYIT; Courses in Blue: Strongly Encouraged by NYIT

Note: Students have to take MCAT exam during late summer or in the Fall semester of Junior Year. NYIT will allow a second attempt in January after their Fall semester of Junior Year.

First Year students can elect to take SEA-PHAGE sequence (BIO 145 & 146) in Fall and Spring semesters if they have transferred elective credits or plan to complete their Social & Behavioral Science electives over summer.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / NYIT College of Osteopathic Medicine Program (4+4 Program)

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	**MAT 121**	**Calculus I**	**4**
BIO 145	*Elective 1a (Sea-Phage Discovery)	2	BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**		**Total**	**16**

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 (Eng 1)	3	MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4	BIO 235	Cell Biology	3
PSY 101	**Elective 2 (Gen Psych.)**	**3**	**SOC 101**	**Elective 1 (Intro to Soc.)**	**3**
	Total	**18**		**Total**	**17**

Year 3					
Fall semester		**Credits**	**Spring Semester**		**Credits**
CHE 311	Biochemistry	3	BIO 240	Virology	3
PSC 315	Immunology	3	BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3	BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3	BIO 355	Biomedical Lab Techniques II	3
	Elective 4 (Genetics)	**3**		Elective 5 (English 2)	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
BIO 253	Scientific Communication	2		BIO 680G	Bacterial Pathogenesis	3
BIO 345	Journal Club	1		BIO 345	Journal Club	1
	Track Elective I (A&PI)	**3**			**Track Elective II (A&PII)**	**3**
	Elective 6	3			Elective 7	3
	Total	**12**			**Total**	**13**

Courses in Red: Required by NYIT

Courses in Blue: Strongly Encouraged by NYIT

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / SUNY Upstate Medical University Accelerated Scholars Program B.S./M.D. (4+4 Program)

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
HUM 101	The Pre-Modern World	3		HUM 102	The Modern World	3
COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**16**

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 (Eng 1)	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 235	Cell Biology	3
PSY 101	Elective 2 (Gen Psych.)	3		SOC 101	Elective 1 (Intro to Soc.)	3
	Total	**18**			**Total**	**17**

Year 3						
Fall semester		**Credits**		**Spring Semester**		**Credits**
CHE 311	Biochemistry	3		BIO 240	Virology	3
PSC 315	Immunology	3		BIO 365	Med. Mycology and Parasitology	3
BIO 370	Microbial Physiology	3		BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3		BIO 355	Biomedical Lab Techniques II	3
	Elective 4 (English 2)	3			Elective 5	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
BIO 253	Scientific Communication	2		BIO 680G	Bacterial Pathogenesis	3
BIO 345	Journal Club	1		BIO 345	Journal Club	1
	Track Elective I (A&PI)	3			Track Elective II (A&PII)	3
	Elective 6	3			Elective 7	3
	Total	**12**			**Total**	**13**

Courses in Red: Required by Upstate Medical University

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Biomedical Track) / University at Albany MPH program with Concentration in Biomedical Sciences (3+2 Program)

Students can transfer a total of 24 credits (8 courses) back from UA to ACPHS in fulfillment of their BS degree requirements. For this program/concentration the following courses will be used.

UA Course - to be transferred from UA to ACPHS	**ACPHS Course - will satisfy the requirement for the following**
BMS 506 Introduction to Immunology	PSC 315 Immunology
BMS 610 Microbial Pathogenesis	BIO 680 Bacterial Pathogenesis
BMS 552 Bioecology of Vector-borne Diseases	Track Elective
BMS 663 Mammalian Genetics	Track Elective
Any 4 MPH courses	4 Free Electives

ACPHS Schedule[1, 2]

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3
COM 115	Principles of Communication	3	MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2	BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**		**Total**	**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 201	The Contemporary World	3	MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4	BIO 235	Cell Biology	3
				Elective 2	3
	Total	**15**		**Total**	**17**

Year 3					
Fall Semester		**Credits**	**Spring Semester**		**Credits**
PSC 311	Biochemistry	3	BIO 365	Med. Mycology & Parasitology	3
BIO 370	Microbial Physiology	3	BIO 340	Microbial Genetics	3
BIO 350	Biomedical Lab Techniques I	3	BIO 355	Biomedical Lab Techniques II	3
BIO 253	Scientific Communication	2	BIO 240	Virology	3
BIO 345	Journal Club	1	BIO 345	Journal Club	1
BIO 480	Micro. Capstone Experience I	3	BIO 485	Micro. Capstone Experience II	3
	Total	**15**		**Total**	**16**

Notes: (1) In addition to the courses shown above, students will need to obtain credit for 1 additional free elective course (i.e. through adding to an existing semester, transfer credit or summer coursework).

(2) Students must take a one semester long social science course (i.e. sociology, psychology, economics) in order to complete MPH admissions requirements. Required courses of the BS Microbiology program fulfil the remaining admissions requirements for this MPH concentration.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

ACPHS B.S. Microbiology (Infectious Disease Epidemiology Track) / University at Albany MPH program with Concentration in Epidemiology (3+2 Program)

Students can transfer a total of 24 credits (8 courses) back from UA to ACPHS in fulfillment of their BS degree requirements. For this program/concentration the following courses will be used. All courses are 3 credits.

UA Course - to be transferred from UA to ACPHS	**ACPHS Course - will satisfy the requirement for the following**
EPI 501 Principles and Methods of Epidemiology I	PAD 393 Epidemiology I
BMS 505 Biological Basic of Public Health	BIO 315 Public Health Microbiology
EPI 503 Principles of Public Health	Track Elective
EPI 605 Infectious Disease Epidemiology	Track Elective
Any 4 MPH courses	4 Free Electives

ACPHS Schedule[1]

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
HUM 101	The Pre-Modern World	3	HUM 102	The Modern World	3

COM 115	Principles of Communication	3		MAT 121	Calculus I	4
BIO 145	*Elective 1a (Sea-Phage Discovery)	2		BIO 146	*Elective 1b (Sea-Phage Bioinformatics)	1
	Total	**16**			**Total**	**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
HUM201	The Contemporary World	3		MAT 145	Elementary Statistics	3
BIO 210	Microbiology	4		BIO 235	Cell Biology	3
SOC 120	Intro to Public Health	3			Elective 2	3
	Total	**18**			**Total**	**17**

Year 3						
Fall Semester		**Credits**		**Spring Semester**		**Credits**
PSC 311	Biochemistry	3		BIO 340	Microbial Genetics	3
PSC 315	Immunology	3		BIO 355	Biomedical Lab Techniques II	3
BIO 350	Biomedical Lab Techniques I	3		BIO 485	Micro. Capstone Experience II	3
BIO 370	Microbial Physiology	3		BIO 345	Journal Club	1
BIO 480	Micro. Capstone Experience I	3			Elective 3	3
BIO 253	Scientific Communication	2				
BIO 345	Journal Club	1				
	Total	**18**			**Total**	**13**

Notes: Students must take a one semester long social science course (i.e. sociology, psychology, economics) in order to MPH admissions requirements. Required courses of the BS Microbiology program fulfil the remaining admissions requirements for this MPH concentration.

**All students will register for BIO 380 Microbiology Seminar (0 credits) every semester.

MS PHARMACEUTICAL SCIENCES

EAR 1 FALL				YEAR 1 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
PSC 631	Foundations of Pharmaceutical Sciences	3		XXX	*Required Course - selected from available list	3
ETH 610	Ethics in Research	1		PSC 651	Pharmaceutical Sciences Journal Club	1
PSC 672	Experimental Design and Data Analysis	2		XXX	*Required Course - selected from available list	3
PSC 661	Research Rotation	2		PSC 761	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 761	Thesis Research	2
PSC 761	Thesis Research	3				
Total Credits		**9**		**Total Credits**		**5**

Non-Thesis Track

YEAR 1 FALL				YEAR 1 SPRING		
Code	**Name**	**Credits**		**Code**	**Name**	**Credits**
PSC 631	Foundations of Pharmaceutical Sciences	3		XXX	*Required Course - selected from available list	3
ETH 610	Ethics in Research	1		PSC 651	Pharmaceutical Sciences Journal Club	1
PSC 672	Experimental Design and Data Analysis	2		XXX	*Required Course - selected from available list	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 750	Capstone	3
XXX	Elective	3				
Total Credits		**9**		**Total Credits**		**6**

New Pre-Med Minor

Description:

The Pre-Med minor (24-25 credits) is available to students at ACPHS and includes six required courses along with two elective courses (one from each of two areas). This minor is designed to provide students with a solid foundation and competency in various aspects of science and healthcare. Curriculum includes courses in biomedical sciences, behavioral/ social sciences, and humanities/ communications. In addition, this minor provides students with the opportunity to gain healthcare experience, learn more about medicine and prepare for both medical school and the application process.

- Minor is available to all students, except PharmD students (contact the Program Director for more details)

Required Courses (18 credits):

- Preparation for Health Professions (PPP 380) – 2 credits
- Experiential Learning in Healthcare (PPP #XX) - 2 credits
- Biochemistry (PSC 311 or CHE 311) - 3 credits
- College Physics II (PHY 222) - 4 credits
- Organic Chemistry II (CHE 202 or 212) - 4 credits
- Literature/ English Course – 3 credits

Must take at least one of the following courses (3-4 credits) in each of the two areas:

Biomedical Sciences:

- Genetics (BIO 225)- 3 credits
- Cell Biology (BIO 235)- 3 credits
- Microbiology (BIO 210)- 4 credits
- Anatomy and Physiology I (BIO 213)- 3 credits
- Anatomy and Physiology II (BIO 215) – 3 credits
- Immunology (PSC 315)- 3 credits
- Molecular Biology (PSC 312)- 3 credits

Behavioral and Social Sciences:

- SOC 335 Global Health
- HIS 330 History of Public Health and Medicine
- COM 330 Intercultural Communication in Healthcare
- COM 320 Patient-Provider Communication
- ETH 310 Bioethics
- SOC 350 Determinants of Health
- PBH3xx Human Trafficking (New course. We are preparing the course proposal for Fall 2020)
- SOC 325 Medical Sociology
- PSY 321 Health Psychology
- PSY 440 Death and Dying
- ETH 315 Health Disease and Authority in Medicine
- HUM 325 Culture and Health in Asia
- HUM 320 Graphic Medicine
- ETH 410 Special Topics in Bioethics

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

https://www.acphs.edu/programs/innovative-learning

LIBRARY SERVICES

Visit https://libraryservices.acphs.edu/home

RESEARCH OVERVIEW

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 Symposium serves as both a showcase for this work and a vehicle for facilitating inter-disciplinary collaborations. A look at the most recent Symposium agenda and abstracts offers a useful guide to understanding the variety of research now taking place at the College. For a more complete overview of recent faculty research, please review the latest report of faculty scholarly activity.

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 Shaker A. Mousa, Ph.D., M.B.A., FACC, FACB, a former Senior Scientist and Fellow at DuPont Pharmaceutical Company is. Chairman and Executive Vice President of PRI. 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.

RESEARCH

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

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.

HUM to ENG Prefix: For students who complete the entire 3-semester Humanities Sequence (Hum 101, Hum 102, and Hum 201) at ACPHS, the prefix of one course in the sequence may be changed from HUM to ENG (upon request to the registrar).

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.

COURSE DESCRIPTIONS:

Art (ART)	Ethics (ETH)	Public Health (BSS, PBH)
Biomedical/Health Sciences (BHS)	General (GEN)	Pharmacy (PHD)
Biology (BIO)	Social Sciences (HHS)	Philosophy and Religion (PHI)
Chemistry (CHE)	History (HIS)	Pharmacy (PHM)
Introductory and Advanced Pharmacy Practice Experience Rotations (CLK)	Health Outcomes and Informatics (HOI)	Physics (PHY)
Clinical Laboratory Sciences (CLS)	Humanities (HUM)	Pharmaceutical Sciences (PSC)
Computer Science (CMP)	Integrated Problem Solving (IPS)	Pharmacy Skills (PSL)
Communications (COM)	Literature (LIT)	Psychology (PSY)
Cytotechnology (CYT)	Mathematics (MAT)	Pharmacotherapy/Pharmacology/ Medicinal Chemistry (PTP)
Economics (ECN)	Music (MUS)	Sociology (SOC)
Education (EDU)	Pharmacy Administration (PAD)	Union Graduate College (UGC)

ART

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)

BIOMEDICAL/HEALTH SCIENCES

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 345

Molecular Diagnostics. The clinical diagnosis using molecular tests has advanced rapidly and become an important field in clinical laboratory science in recent years. The purpose of this course is for students to learn fundamental theory, basic skills and advanced technology in the molecular diagnostics. In this course students will study molecular methods including nucleic acids extraction, PCR and real time PCR, hybridization and next generation sequencing. After that students will also learn how to apply these methods in the detection and diagnosis of infectious disease, cancer and genetic disorders. (3); Prerequisites: BIO 235, CHE 311.

BHS 346

Molecular Diagnostics Lab. The laboratory section of this course introduces the theory and use of molecular techniques in the clinical diagnostics lab, with an emphasis on chromosome analysis, nucleic acids isolation, handling, and storage. Analytical techniques common to the molecular lab such as polymerase chain reaction (PCR), quantitative real time PCR (qRT-PCR), and DNA bioinformatics tools will be emphasized. The laboratory exercises are designed to provide a hands-on context for some of the topics being presented in the course lectures and in the readings from the course textbook. (1); Prerequisites: BIO 235, CHE 311.

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 course 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 of basic 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

BIOLOGY

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 selfdiscovery. 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 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 is the first course in a sequence which studies human anatomy and physiology. The goal of this course is to provide an introduction to the function, regulation and integration of organs and organ systems involved in the human body. This course will begin with an introduction, and review of the basic chemistry, cell and tissue concepts covered in General Biology. Topics covered in this course will include the anatomy and physiology of the integumentary, skeletal, muscular, and nervous systems, and special senses. (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, 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 is the second in a sequence of two courses that studies the function, regulation and integration of organs and organ systems involved in human anatomy and physiology. This course will focus on the endocrine, cardiovascular, lymphatic, respiratory, urinary, and digestive systems. Also covered will be aspects of metabolism, fluid-electrolyte-acid-base balance and temperature regulation. (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, 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 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: BIO101/111, 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 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 331

Mammalian Cell Culture. Mammalian cell culture technology is about maintaining cells in vitro under controlled conditions for research or biologics production purposes. In recent decades, this technology has advanced significantly and these cells are used in variety of application. As a student in the class you will be exposed to the different methodologies utilized to grow cells and how this technology is becoming critical in production of many of the health care products used to control human diseases. The course will be divided into four general sections: (1) Basic techniques for culturing and sub-culturing mammalian cells and growth parameters, (2) Quality control of a cell culture laboratory- How to control contamination, (3) Primary cell culture and development of cell lines, and (4) Scale-up of cell culture from a T-Flasks/Spinner Flasks to a bioreactor. (3)

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 348 G
Microbial Fermentation. This lecture/laboratory course builds upon the scientific knowledge underlying the principles (for example fluid flow, mass transfer, heat transfer, and the energy relationship of fluid systems) of fermentation technology to design, develop, and optimize key parameters in a biomanufacturing process. Topics includes the optimization of media composition, fermenter and bioreactor design, the strain and host selection, instrumentation, bioreactor design, scale-up and process analytical tools to maximize the yield and integrity of a pharmaceutical fermentation product. We begin by covering introductory headings such as microbial metabolism, strain selection and genetic engineering principles. Then we dive into fundamental engineering aspects of microbial bioprocessing from thermodynamics, fluid mechanics and transport phenomena perspectives in basic engineering fermentation processes. We continue complement these by covering fermentation regimes, process optimization and scale-up strategies and finally finish with several industrial case studies and product development considerations. (3); Prerequisites: BIO 101, BIO 102, 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 365
Medical Mycology and Parasitology. This first half of this 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. The second half of the course will introduce students to protozoan and helminth parasites of medical and veterinary importance; life cycles, morphology, physiology, taxonomic classification, host-parasite relationships, economic and public health aspects and current topics in parasitic diseases. (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 610 G

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 examined. In addition, methods for modifying immune responses through drugs and vaccines are discussed. Prerequisites: BIO 101, BIO 102, BIO 235 is recommended. (3)

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 627 G

Innate Immunology. This lecture and literature based course provides an in-depth analysis of the general concepts of immunology with a particular focus on innate immunity. Topics presented will include a general overview of the immune system to include both the innate and adaptive response. The course will then focus on innate immunity to include; phagolysosome mediated pathogen killing, role of TLR, NOD and RLR in response type, cytokines/chemokine and signaling pathways, and inflammasome. Diseases associated with response dysfunction will also be discussed. This course will consist of lecture, current literature review and student peer-reviewed article presentations; group discussions and student presentations will be essential aspects in demonstrating knowledge; Prerequisite: BIO 101/111 and BIO 102/121. PSC 315 or equivalent is recommended. (3)

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 631 G

Mammalian Cell Culture. Mammalian cell culture technology is about maintaining cells in vitro under controlled conditions for research or biologics production purposes. In recent decades, this technology has advanced significantly and these cells are used in variety of application. As a student in the class you will be exposed to the different methodologies utilized to grow cells and how this technology is becoming critical in production of many of the health care products used to control human diseases. The course will be divided into four general sections: (1) Basic techniques for culturing and sub-culturing mammalian cells and growth parameters, (2) Quality control of a cell culture laboratory- How to control contamination, (3) Primary cell culture and development of cell lines, and (4) Scale-up of cell culture from a T-Flasks/Spinner Flasks to a bioreactor. (3)

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 641 G (pending approval)

Current Topics in Biopharmaceutical Technology. This course will cover special research topics related to emerging and existing technologies in biopharmaceutical manufacturing. The theme of the Spring 2021 course offering will be cell and gene therapies, including but not limited to stem cell engineering, clinical applications of regenerative medicine, and novel approaches to deliver therapeutic biologics. The impact and critical importance of future advances in cell- and gene-based therapeutics within the biopharmaceutical industry will be discussed. (3)

BIO 648 G
Microbial Fermentation. This lecture/laboratory course builds upon the scientific knowledge underlying the principles (for example fluid flow, mass transfer, heat transfer, and the energy relationship of fluid systems) of fermentation technology to design, develop, and optimize key parameters in a biomanufacturing process. Topics includes the optimization of media composition,

fermenter and bioreactor design, the strain and host selection, instrumentation, bioreactor design, scale-up and process analytical tools to maximize the yield and integrity of a pharmaceutical fermentation product. We begin by covering introductory headings such as microbial metabolism, strain selection and genetic engineering principles. Then we dive into fundamental engineering aspects of microbial bioprocessing from thermodynamics, fluid mechanics and transport phenomena perspectives in basic engineering fermentation processes. We continue complement these by covering fermentation regimes, process optimization and scale-up strategies and finally finish with several industrial case studies and product development considerations. Prerequisites: BIO 101, BIO 102, BIO 210. (3)

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 665 G

Molecular Biosciences Capstone. This course will serve as a culminating part of the MS degree program with capstone option. It will require the production of a peer-reviewed, journal article quality, written document. The document (25-40 pages) will either be 1) a major literature review on an existing scientific topic that is relevant to the student's field of study or 2) based on a no-credit experiential learning experience such as a co-op, internship, or basic/clinical lab research. Upon completion of the course, the student will demonstrate the ability to understand, synthesize and analyze a complex industrial/clinical/scientific topic using critical thinking skills, evaluating possible outcomes and clearly presenting sound scientific conclusions. Students will be required to orally present and successfully defend their final capstone report for committee review. Prerequisites: BIO 650. (4)

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 675 G

Biopharmaceutical Capstone. The Capstone Course will serve as a culminating part of the MS degree program. It will require the production of a peer-reviewed, journal article quality, written document. The document (25-40 pages) will either be (1) a major literature review on an existing scientific topic that is relevant to the student's field of study or (2) based on a no-credit experiential learning experience such as a co-op, internship, or lab research. Upon completion of the course, the student will demonstrate the ability to understand, synthesize and analyze a complex industrial/scientific topic using critical thinking skills, evaluating possible outcomes and clearly presenting sound scientific conclusions. Students will be required to orally present and successfully defend their final capstone report for committee review. (3)

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 690G

Viral Pathogenesis. Considering the increased burden of viral diseases as well as more frequent viral outbreaks, it becomes immensely important to equip new generation of health professionals and researchers with an extensive understanding of viral pathogenesis. This lecture- based course is intended to provide an in-depth understanding of molecular mechanisms underlying diverse virus-induced pathogenesis affecting various tissues. This course will be conducted in 3 parts. In the first part, students will be familiarized with the basic concepts of viral structure, entry, mode of replication, and viral evasion of host immune response. Second part will deal with viral invasion and pathogenesis including neuropathology, cardiovascular complications, inflammation, malignancies, developmental defects, and respiratory complications. The last component will include discussion of advanced research (journal-club style) in the field of viral pathogenesis to enhance student's scientific communication and critical thinking skills. Overall, this course will provide a comprehensive account of disease manifestation by leading viral pathogens (e.g. HIV, HCV, Flaviviruses, Coronavirus, Influenza virus, Herpesvirus, Hepatitis C virus, HPV, and HTLV-1). (3)

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)

CHEMISTRY

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 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 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 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

INTRODUCTORY & ADVANCED PHARMACY PRACTICE EXPERIENCE ROTATIONS

CLK 798
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 inter-professional 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); Prerequisites: New York State pharmacy intern permit or equivalent for the State in which rotation will be completed.

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); New York State pharmacy intern permit or equivalent for the State in which rotation will be completed, successful completion of CIPPE (CLK 798).

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: PLS 431, PSL 432, 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.

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. These required, 6-week, 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)

CLINICAL LABORATORY SCIENCES

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 in the clinical hematology laboratory. The lecture and laboratory will highlight physiology, pathophysiology and laboratory testing of blood and bone marrow cells, and the evaluation of hemostasis and hemostatic disorders. (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
Principles of Clinical Laboratory Management. 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 in the clinical hematology laboratory. The lecture and laboratory will highlight physiology, pathophysiology and laboratory testing of blood and bone marrow cells, and the evaluation of hemostasis and hemostatic disorders. (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 course

COMPUTER SCIENCE

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)

COMMUNICATIONS

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, 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.

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 250- Persuasion and Social Influence
This course prepares students to become agents of change, capable of influencing the choice-making of individuals, organizations, and communities. Coursework provides students with foundational knowledge and skills in three interrelated domains of social influence: 1) logic and reasoning; 2) rhetoric and persuasion; 3) bargaining and negotiation. Students will develop and apply these skills through interactive communication projects that span a range of media (oral, textual, visual, and digital).

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 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 318- Health Teamwork
This course develops core communication competencies required for contemporary health teamwork, using dynamic game-based learning design and team-based experiences as contexts for concrete application of course concepts. Key topics include interdisciplinary role relationships, leadership styles, decision-making, and conflict management. The course adopts an ecological model of health and healthcare, examining the interactions and interdependencies of diverse professionals from across the health system (e.g. epidemiologists, health educators/interventionists, healthcare providers, policy makers, and more).

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 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 Health
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

CYTOTECHNOLOGY

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

ECONOMICS

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)

ETHICS

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 ethically - 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)

GENERAL

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)

SOCIAL SCIENCES

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

HISTORY

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 WWI 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

HEALTH OUTCOMES AND INFORMATICS

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

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

HUMANITIES

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).
Fiction and Film is designed to deepen students' comprehension and enjoyment of both fiction and film as well as their understanding of the process of adapting written texts to the screen. Students read three short novels or short stories and view the film adaptations. These books, stories and films pose particular questions and challenges to the process of adaptation as well as illustrate certain key concepts of literary and film texts. Students will also work on a project that provides practice in the process of adaptation and will have the option of making their own short film.

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, 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

INTEGRATED PROBLEM SOLVING

IPS1a-IPS305
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 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.

IPS4a-IPS406
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.

IPS5a-IPS506
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.

LITERATURE

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

MATHEMATICS

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 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)

MUSIC

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)

PHARMACY ADMINISTRATION

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, T hird 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 successful leaders lead by example, inspire, challenge, enable and encourage others to make extraordinary things happen in organizations. Five key leadership practices will be presented by the instructors, along with case studies in which these leadership practices are exemplified by remarkable leaders, as demonstrated their words, actions and behaviors. This course is designed to allow the students to recognize the application of the leadership practices using short video clips and other media. Students are directly involved in the teaching and learning process by analyzing and explaining assigned and self-selected case study leaders. Students also develop their own code of leadership which they can apply to their personal and professional lives. (3); Prerequisite: Doctor of Pharmacy in years P-1 – P-3, 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 520

Preparing for Residency: This 1 credit hour elective course provides a comprehensive introduction to post-graduate residency training with the goal of preparing students to be competitive residency candidates. Students will gain understanding of what residency is, the various types and characteristics of residency programs, and the possible benefits this training offers. Skills such as CV writing, interviewing, and professionalism will be covered. This is a hybrid course consisting of both face-to-face interactions and online activities, with majority of the course requiring independent-individual study. Students will apply course content via completion of a mock residency application and participation in a mock interview as part of a live 2-day workshop. Motivated students with a

tentative or definite interest in post-graduate residency seeking additional information and guidance through the application process will benefit most from this course.

PAD 521

Pharmacy Administration. Effective management in all pharmacy practice settings is contingent upon an appreciation for and understanding of the business of 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 medication safety and quality, 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 the students to be knowledgeable about and sensitive to the issues concerning pharmacy from the perspectives of all stakeholders (e.g. patients, providers, manufacturers, employees, etc.) and to develop the management skills necessary for success in practice (3); Prerequisites: PAD 415, PSC 441

PUBLIC HEALTH

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 Public Health 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)

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

PBH 220- 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)

PBH 230- Statistics for Public Health
Students will identify and apply the basic concepts and methods of biostatistical data analysis in public health. Data usage, analysis, and evidence-based approaches to public health data will be introduced. Specific topics covered include epidemiological study design, descriptive statistics, probability, confidence interval estimation, hypothesis testing, and power and sample size calculations. Regression analysis will be introduced.

PBH 310- 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)

PBH 320- 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 335- Determinants of Health
This course will familiarize students with the biological and social determinants of health and health

outcomes in the United States and the multiple, often-overlapping factors underlying health disparities, including race, class, gender, sexuality, immigration status, and the environment. It will draw from biomedical sciences, public health, social sciences and the humanities to enrich our understanding of the determinants of health. Using the lens of social justice, root causes are explored and organizations working toward just solutions are highlighted. Students will be challenged to move 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.

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 350- Epidemiology
Epidemiology is the foundational science of public health. Public health relies on evidence generated by epidemiologic inquiry in order to form policy, shape social norms, make treatment and prevention recommendations, and control disease. In this introductory epidemiology class, students will learn epidemiologic methods through practice-based activities. The activities include: solving an outbreak in real time; ruling in on the science behind the dramatic changes in smoking norms in US since the 1960's; role playing John Snow's London cholera ghost map in the 1850's; debating the personal impact of the international public health community's strategy to end the HIV/AIDS epidemic; and discovering the breadth of public health by researching the discoveries of famous epidemiologists. This class stresses two core competencies of public health professionals: public health communication and information literacy.

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

PBH 365- Service Learning in Public Health
Service learning combines academic instruction with community service and focuses on critical, reflective thinking along with personal and community responsibility. This course provides an immersive service experience addressing a public health need that will vary by semester based upon community needs. Students will work closely with faculty and community members and be mentored on how to address real-world public health problems in Albany, with attention to underlying systemic issues.

PHARMACY

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

PHILOSOPHY & RELIGION

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 260
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.(3 credit)

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 360
Mindfulness Based Stress Reduction (MBSR) is a practice-focused course in meditation, mindfulness, and gentle yoga practices 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. Students will also examine the philosophical and practical underpinnings of Mindfulness Based Stress Reduction, and investigate research on its health benefits. (3 credit)

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)

PHARMACY

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 synchronous and asynchronous online lectures with

engagement activities, and post-class assignments designed to expose students to a comprehensive introduction to the Profession and Practice of Pharmacy, Professional Identity Formation, 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 breakout rooms, and participate in role-playing and in-class quizzes and complete various tutorials. The top 100 Drugs U Should Know (DUSK) are introduced as prerequisite preparation for upcoming practice experiences. This course is a prerequisite for the Introductory Pharmacy Practice Experiences (IPPEs). (2)

PHM 324

Pharmaceutical and Biopharmaceuticals Industry Entrepreneurship This course will provide an overview of the pharmaceutical/biopharmaceutical industry covering the following topic areas: research, development, clinical pharmacology, medical affairs, regulatory, marketing, sales, distribution, and 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/biopharmaceutical industry in each of the listed topic areas. The course will be team taught by industry experts. The course will be coordinated by ACPHS faculty.

PHM 330

Patient-Centered Care Experience. Much attention has been paid to the importance of patient-centered care and the benefits of tailoring treatment and therapy to the individual patient. This course deals with an extension of the definition of patient-centered care and methods and strategies to extend the health care professional's perspective to tailor the entire care experience to the individual patient. Some of the topics covered include health/wellness/consumerism, cultural and religious diversity, patient advocacy, personalized service, and relationship-centered care. Students will be provided with an opportunity to apply knowledge and skills through the completion of a project, which consists of identifying an initiative or strategy to improve the patient care experience in a community health care clinic which serves the under-served population. Some class time will be spent in virtual meetings with staff from the community health care clinic to explore possibilities to improve the patient care experience. (3) P1 – P3 students, BS Public Health 3rd and 4th year students.

PHM 335

Pharmacy Professional Development: This online course builds on concepts introduced in the required Foundations of Pharmacy course, and is ideal for P2 & P3 students. PPD offers students an engaging environment with ample opportunities for personal and professional growth, and development of practice skills. Curricular modules include 1) foundational topic exploration (e.g., evidence-based medicine; social determinants of healthcare; digital health education; medication safety, adherence, and health literacy; use of and writing for the pharmacy literature; and co-curricular application); 2) critical reflection and professional identity formation; and 3) pharmacy career exploration. Course activities will include preparing/delivering topic presentations in virtual classrooms; giving and receiving peer-review of written and verbal work; communicating in writing through online interactions, written topic paper, slides, and poster medium; identifying, citing and evaluating primary literature; interviewing a pharmacy professional with (virtual or real) experiential site visit, and examining professional websites for career exploration research; reading

professional excerpts and engaging in critical reflection on professional identity formation; and developing course assignments using varied media, such as PowerPoint slides, Publisher for e-poster career exploration research, and Zoom for online interactions. The major graded assignments include verbal presentation; written paper; reflective exercises; and poster presentation; there are no quizzes or exams. This course provides excellent preparation for students seeking postgraduate residency training. Maximum of 16 students. (3)

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 436

Drug interactions: Description: This professional elective will introduce students to the mechanisms of drug interactions, the tools required to interpret the drug interaction literature and will provide a series of lectures that stress the more common drug interactions observed when treating specific disease states. The literature interpretation skills and drug interaction knowledge base acquired from this course will help students identify drug interactions, develop a patient specific recommendation to manage a drug interaction and answer drug information questions: important clinical skills for progressing through experiential education and into practice. Prerequisites: PharmD Program P1 Year. Professional Elective for the Pharmacy Program.

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 inter-professional 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 healthcare 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 expected 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 551

Critical Concepts in Pain Management: The opioid epidemic has highlighted the critical role of rational pain management in preventing patient harm, improving patient safety, and facilitating patient achievement of a functional, productive life. This Professional Elective is a 3 credit course offered only to P3 students that will build off of pathophysiologic, pharmacologic, and advanced problem solving concepts that have already been taught in the curriculum. Course content will include pharmacotherapeutics and evidence-based strategies for management of acute and chronic pain, including pharmacological and non-pharmacological modalities, interventional pain techniques, and care of specialized populations including cancer pain, end-of-life, opioid use disorder, and rheumatological disease. The class will meet two days a week; one day with an interactive lecture and one day with small group complex case evaluations. Students will practice integration of evidence based medicine into pharmacotherapeutic plans, presenting patient plans according to medical convention. Students will have the opportunity to obtain certification as a naloxone carrier during this course. This course is taught by ACPHS faculty and Albany Medical College physician faculty, with additional guest lecturers invited to instruct in their area of expertise.

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 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 718/719

Independent Study and/or Research: PharmD Students may register for up to three credit hours per semester under a faculty member’s supervision. The course content varies with the student and the project, according to the judgment of the supervising faculty member. Interested students with cumulative overall and professional GPAs of 2.5 or higher must submit a written plan for the independent study/research that will be approved by the faculty member and department Chair. This plan shall include the student’s statement of the scope, learning objectives, outline of topics and learning activities, with faculty supervisor’s description of how student performance will be evaluated within a timeline. Independent research should be a hypothesis-driven project that leads to written reports and/or oral presentations. Deadline for submission of the plan to the registrar is by the first week of the semester.

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)

PHYSICS

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 one-semester algebra-trigonometry-based introductory physics course discusses fundamental principles underlying physical phenomena. These principles form a foundation of our understanding of chemistry, biological and pharmaceutical sciences. Emphasis is on solving qualitative and quantitative problems using a variety of basic mathematical methods. The topics include kinematic description of motion; Newtonian dynamics; the concepts of work and energy; energy conservation law; mechanics of fluids; basic thermodynamics; introduction to nuclear physics. Recitations are conducted in relatively small, highly interactive classes designed to promote the development of problem-solving skills. The laboratory portion of the course complements its theoretical component and, in particular, familiarizes students with modern experimental techniques and skills including computerized data collection. (4); Prerequisite: MAT 111 or MAT 121; 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

PHARMACEUTICAL SCIENCES

PSC 110

Scientific Reasoning and Analysis I: The courses (PSC110, PSC111 and PSC112) that make up the SRA sequence focus on historical and contemporary topics in science. Using a wide variety of communication formats, the essential elements of successful oral presentation and scientific writing to targeted audiences are analyzed. Scientific Reasoning and Analysis 1 is focused on the use of data to support hypotheses by evaluating historical examples of data utilization (both appropriate and inappropriate). Topics include Evolutionary Theory, Eugenics, and Viral Reassortment studies related to pandemics. The course emphasizes writing, revision, analysis, and the delivery of scientific information through short essay assignments. Upon completion of this course, students will gain a deeper understanding of the scientific mode of inquiry and how these principles help shape scientists. (2)

PSC 111

Scientific Reasoning and Analysis II: The courses (PSC110, PSC111 and PSC112) that make up the SRA sequence focus on historical and contemporary topics in science. Using a wide variety of communication formats, the essential elements of successful oral presentation and scientific writing to targeted audiences are analyzed. SRA 2 is focused on clinical milestones in science and medicine with an underlying theme of exploring historical and contemporary medical breakthroughs through an analysis of ethical implications. Topics include Unethical Experiments, the Use of Animals in Research, and the Complexities of the Modern Healthcare System. The course emphasizes weekly journal entries with group discussion on contemporary scientific publications as well as the development of individual "ideal" healthcare systems. Upon completion of this course, students will understand how to evaluate and disseminate current scientific knowledge as well as understand the challenges and promises of modern medicine. (2)

PSC 112

Scientific Reasoning and Analysis III: 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. Scientific Reasoning and Analysis 3 is focused on literature review and oral communication skills. Acquired communication skills are further honed through group discussion, critique, and practice with an emphasis on the development of a review paper. Topics include Barriers to Scientific Communication, Criticism & Critique in Science, and a discussion of Alternative Careers in Science. Upon completion of this course, students will understand how to synthesize primary literature into a review-style paper that can provide a foundation for their Thesis studies. In addition, students will have sharpened their communication/presentation skills and will be well-prepared for their coursework in the later years of the Pharmaceutical Sciences program. (2)

PSC 115

Survey of Pharmaceutical Sciences: This course will introduce students to essential therapeutics by examining the discovery and development of drugs through the lens of pharmaceutical sciences. The history and application of major pharmaceutical sciences disciplines (i.e. pharmacology, medicinal chemistry, pharmaceutics, pharmacokinetics, bioanalytics) to therapeutic development will be explored using examples such as penicillin, Taxol, insulin, and others. Upon completion of this course, students will understand how pharmaceutical sciences provides a critical foundation to the healthcare professions. (1)

PSC 210

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 215

Pills, Potions and Poisons: A Pharmacology Primer: This course provides an introduction to the general principles of pharmacology. Students will study the discovery and use of different classes of drugs and toxins on various systems of the human body. Drugs of interest will include small molecule inhibitors, biologics, and gene therapies. Learn about new drug discovery and the development process. Gain an understanding of poisons used in crime, drugs pulled from the market, and mood-altering drugs. This course is designed for those interested in health care professions, basic scientific research and biotechnology.

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

Students will build their knowledge of various topics in Pathophysiology and Medicine by readings, discussing, analyzing and interpreting data from the scientific literature. Students are expected to be active participants in presenting, discussing, critiquing and interpreting 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 280

Introduction to Pharmacy Calculation: This course includes material where students work on basic and introductory calculations related to pharmaceutics. This course will introduce students to basic and foundation- level math skills expanded upon in Pharmacy Skills lab I and II in order to allow students to gain expertise, mastery and confidence in these areas. Pre-requisites: PSC 311, CHE 220, CHE 221

PSC 281

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 neurosciences (3).

Prerequisites: BIO 102/121

PSC 311
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 different organs.

PSC 312
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 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); Prerequisites: 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 examined. 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 321
This course sequence (PSC321, PSC322) 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. Pre-requisites: BIO 121 and BIO 102 (General Biology I and II). Pre-requisites: BIO 121 and BIO 102 (General Biology I and II)

PSC 335
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: This course studies the physicochemical principles of pharmaceutical dosage forms and drug delivery. It introduces and integrates the physical, chemical and mathematical principles, theories, terminology, calculations and methodologies of physical pharmacy, dosage forms and drug delivery systems. The topics include introductions to pharmaceutics, principles and properties of solutions, solution dosage forms, properties of dispersions, dispersion dosage forms, pre formulation, quality standards, and the process of new drug development and approval. Pre-requisites: BIO121, CHE122, PHY222 and MAT111, or Permission of instructor

PSC 342

The Pharmaceutics course sequence focuses on the principles of drug delivery and produce designed. 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); Prerequisites: PSC 341 or Permission of the instructor.

PSC 369

Molecular Foundations of Drug Actions. 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. Although an emphasis will be placed on orally bioavailable small molecules, various drug modalities will also be discussed. Since the material covered in this course is applicable to all of the drug classes, this course is a prerequisite for all of the PTPM modules.

PSC 370

Pharmacogenomics: This course, which follows MFDA I, covers the enzymes responsible for phase I and phase II metabolism of drugs as well as pharmacogenomics. The reactions catalyzed by phase I and phase II enzymes, as well as the regulation of the activity of these enzymes by a variety of factors, will be discussed. Genetic variation in phase I enzymes, phase II enzymes, drug transporters, and drug receptors will also be covered. Specific examples of differences in drug

effects and toxicity in patients with different genetic backgrounds will be provided to introduce students to the application of knowledge of patient-specific genetic differences to achieve better therapeutic outcomes (personalized medicine). Prerequisites: Biochemistry (PSC 311); Molecular Biology (PSC 312), pre- or co-requisite.

PSC 410
This course is required for all Pharmaceutical Sciences B.S. students. Students will work with an identified faculty mentor to develop a thesis proposal. The proposal will provide appropriate background, hypothesis, specific aims and methods for the thesis project. The written proposal will be no less than 5 pages in length (not including references). The proposal must be approved by the faculty mentor prior to final submission. Student will prepare and present a brief seminar of their thesis proposal (approximately 20 minutes in length). The faculty mentor will assign the Thesis I grade, which will be uploaded by the course coordinator. Pre/Co-requisites: Scientific Reasoning and Analysis sequence (PSC110, PSC111, PSC112)

PSC 411
This course is required for all Pharmaceutical Sciences B.S. students completing an undergraduate thesis project. Students will work with a faculty mentor to complete the research project proposed in PSC410. Completion of the research project will include both a final written thesis document and oral presentation of the major results from the student's work. The written thesis will be no less than 15 pages in length (not including references). The thesis must be approved by the faculty mentor prior to final submission. Student will prepare and present a brief seminar of their research findings (approximately 20 minutes in length) which can be given individually or during a sponsored research symposium (ex: the ACPHS Student Research Symposium). The faculty mentor will assign the Thesis II grade. Pre/Co-requisites: PSC410

PSC 412
This course is required for all Pharmaceutical Sciences B.S. students completing an undergraduate thesis project. Students will work with a faculty mentor to complete the research project proposed in PSC410. Completion of the research project will include both a final written thesis document and oral presentation of the major results from the student's work. The written thesis will be no less than 15 pages in length (not including references). The thesis must be approved by the faculty mentor prior to final submission. Student will prepare and present a brief seminar of their research findings (approximately 20 minutes in length) which can be given individually or during a sponsored research symposium (ex: the ACPHS Student Research Symposium). The faculty mentor will assign the Thesis II grade.

PSC 421
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
This introductory course is required for B.S. Pharmaceutical Sciences students. The course reviews

the foundational topics in Pharmacology and Medicinal Chemistry, setting the stage for subsequent courses in Pharmacology and 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. Pre- or Co-requisites: PSC 311, PSC 312, PSC 321 and PSC 322

PSC 432
This course is required for all BS Pharmaceutical Sciences students. The course covers major drug classes, including antibiotics, anti-mycobacterial and antivirals. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of model compounds from each drug class will be considered. Pre-requisites: PSC 431

PSC 433
This course is required for all Pharmaceutical Sciences B.S. students (Pharmacology Track). The course focuses on drugs that affect the central and peripheral nervous systems including autonomic drugs, antipsychotics, antidepressants, analgesics etc. The mechanism of action, adverse effects, structure activity relationships, and pharmacokinetics of each drug class will be considered. Pre/Co-requisites: PSC 431

PSC 434
This course is required for all Pharmaceutical Sciences B.S. students (Pharmacology Track). The course focuses on drugs that affect the cardiovascular system including anti-hypertensives, diuretics, anti-dyslipidemics, anti-coagulants, and anti-arrhythmic agents. The mechanism of action, adverse effects, structure -activity relationships, and pharmacokinetics of each drug class will be considered. Pre/Co-requisites: PSC 311, PSC 312, PSC 321, PSC 322, PSC431

PSC 441
This course presents concepts and mathematical techniques used to describe the time course of drug absorption and disposition of biological systems. 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. Prerequisites: PSC 341 and PSC 342

PSC 445
This multi-disciplinary course will cover all components of drug discovery and development, from the bench to the bedside, include 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 o concurrent enrollment in PSC 431 or PTP 401

PSC 446
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 federal 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

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

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 evidence-based recommendations. This course will thus provide students with multiple opportunities to present and discuss data and to present a scientific seminar. 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 620 G

Downstream Processing of Biopharmaceutical Products. This course will serve to introduce students to downstream bioprocessing principles, techniques, and analyses related to the purification of microbial and mammalian biologics. Pharmaceutical manufacturing requires both quality control (QC) monitoring and knowledge of analytical techniques to ensure product purity, identity, and safety. This course will combine lecture discussion of major analytical methods used in

the purification of biologics with hands-on laboratory training in core techniques (i.e. chromatography, electrophoresis, photometry, spectroscopy, microscopy). Upon completion of the course, students will demonstrate the ability to work in a GMP facility

PSC 625 G

Applied and Clinical Biochemistry. This course will help students develop an understanding of biological molecules and their relationship to common disorders. Using applications and clinical correlations, the course will reinforce the role of enzymes as building blocks of life and in catalyzing and regulating biochemical reactions within the body. The integration of various metabolic pathways, cellular metabolism, and biosynthesis with emphasis on the key concepts of structure and function of macromolecules involved in physiological processes will serve as the basis for an understanding of drug action and drug development. Biomolecular techniques related clinical analysis will also be explored. Upon the completion of this course, students will learn the applications and clinical implications of human biochemistry, the cellular basis for several common genetic diseases and metabolic disorders, and essential techniques related to clinical biochemistry.

PSC 631 G

This introductory course is required for all Pharmaceutical Sciences M.S. graduate students. The course reviews foundational topics in Pharmacology, Pharmaceutics and Medicinal Chemistry, setting the stage for subsequent required and elective courses. 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 and factors affecting drug action, principles of computational modeling of receptor-drug interactions, and rational drug design. Pre-requisites: Biochemistry, Physiology, Immunology, and Molecular Biology or Permission of Instructor

PSC 635 G

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 molecular 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 signal 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.

PSC 636 G

The course covers autonomic drugs, CNS drugs, including anesthetics, sedative hypnotics, 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); PSC 635G or equivalent

PSC 645 G

This course studies physiochemical 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 TO BE OFFERED IN FALL OF 2021

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 drug 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, cases 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 in a regulatory career or applying regulatory principles, knowledge and skills to research, business or healthcare practice. (3); Prerequisites: PSC 341 or 645 or equivalent.

PSC 651 G
A weekly critical reading and analysis of selected articles on original research from top-tier journals. Presenting students are responsible for literature search, article selection and presenting a brief summary. All students are responsible for pre-class preparation. This includes reading the article, performing a critical review, and reading reference and background material. All student are also responsible for answering the instructor's questions and engaging in discussions of the article in class. Articles must be approved by the Course Instructor. Articles must be posted as a PDF one week prior to the presentation date. The student must not select an article that he or she has previously, critically analyzed for another course or purpose under the guidance of an instructor or mentor.

PSC 661 G
Students will complete a one semester laboratory rotation in order to facilitate the section 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 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 one (1) lab and a maximum of two (2) labs during the semester. They are to meet with the faculty advisor at least one hour per week for basic instruction 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 provides students with a basic knowledge of experimental design and biostatistics. Students will learn how to design experiments and analyze

and interpret the results. Topics include confidence intervals, hypothesis testing power, nonparametric methods, and one- and two-way analysis of variance. Students will learn how to use computer software for many of the applications. (2)

PSC 732 G
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 disease. (2); Prerequisites: Permission of the instructor

PSC 733 G
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. Pre-requisites: Graduate standing or permission of the instructor.

PSC 741 G
This course focuses on the fundamental basis of biopharmaceutical and pharmacokinetic principles used in the selection, dosing, monitoring and evaluation of drug therapy. Application of these principles in evaluating drug literature and developing drug dosage regimens of selected classes of drugs for individual patients will be discussed. Emphasis will be placed on using computer software for solving pharmacokinetic problems. The course will consist of online lectures, case-based tutorials, active learning, and independent projects.

PSC 742 G
This is a transitional and multidisciplinary 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 support 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
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
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 645G or permission of the instructor.

PSC 750 G
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 757 G
The principles of subcellular pharmacokinetics are combined with the methods of 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 of 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
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 include sketching molecular structures, docking them into macromolecular targets and performing simple binding energy predictions. (3); Prerequisite: Permission of the instructor

PSC 760 G
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 and 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 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
Students will learn practical aspects of one or multiple fields of 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

PHARMACY SKILLS

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 complete an education and training program in Screening, Brief Intervention and Referral to Treatment (SBIRT). Upon successful completion of the SBIRT program, a certificate of completion will be achieved. 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

PSYCHOLOGY

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

PHARMACOTHERAPY/PHARMACOLOGY/MEDICINAL CHEMISTRY

PTP 410
PTPM Respiratory. PTPM 2 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: PSC 369, PHM 329

PTP 425
PTPM Endocrine. PTPM 3 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: PSC 369, PSC 370, PTP440

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: PSC 369, PSC 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. PTPM 5 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: PSC 369, PSC 370; PHM 329

PTP 515
PTPM Rheumatology Oncology. 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: 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: PSC 369, PSC 370, PTP 440, PSC 321, PSC 322

PTP 528
PTPM Genitourinary. PTPM 3 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; PSC 321, PSC 322

PTP 549
PTPM Neuro-Psychiatric Disorders. PTPM Neuro/Psych is a 4-credit course focusing on neurologic/psychiatric disases . 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 psychiatric 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; PSC 321, PSC 322

SOCIOLOGY

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 textbooks, 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 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 disability 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

UNION GRADUATE COLLEGE

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]

BOARD OF TRUSTEES

MARION MORTON, '84, CHAIR

Marion Morton, R.Ph., M.B.A., has more than 25 years of experience in the pharmaceutical industry in marketing, sales, managed care, and customer relations. Her positions have included Global Category Head of Obesity Care at Nestlé Health Sciences, Vice President of Cardiovascular Marketing at Boehringer-Ingelheim, and Vice President of the Transplant Business Franchise for Novartis. She also worked in the Worldwide Medicines Group for Bristol-Myers Squibb.

MATTHEW BETTE, VICE CHAIR

Matthew 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

Walter 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.

LEIGH BRISCOE-DWYER, ’87

Leigh Briscoe-Dwyer, R.Ph., Pharm.D., BCPS, serves on the Board of Directors for the American Society of Health System Pharmacists® (ASHP). She has also served as a New York delegate to the House of Delegates, Chair of the Committee on Nominations, and was a member of the Council on Public Policy, the Practitioner Recognition Committee, and the Advocacy & PAC Advisory Committee and is a past President of the New York State Council of Health-system Pharmacists.

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.

BOARD OF TRUSTEES

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.

CHRISTOPHER DI LASCIA, ’83

Christopher 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

Michael Duteau, R.Ph., is Vice President of Strategic Growth and Operations at Noble Health Services. He previously served as Vice President of Business Development and Strategic Relations at Kinney Drugs, and before that, 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.

EDWARD J. ENOS, '84

Edward J. Enos, MS, RPh began his career as a pharmacist for Community Health Plan, then transitioned to specialize in computerized patient files, registration, and scheduling and implemented the first Electronic Medical Record (EMR) system in the Capital District. As Director of Operations for Community Care Physicians, Mr. Enos managed 22 primary care, general surgery and imaging locations. Currently, Mr. Enos is a healthcare and physician practice consultant working with clients that include St. Peter’s Health Partners and Hudson Headwaters Health Network.

BOARD OF TRUSTEES

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.

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.

PAMELA SCHWEITZER

Pamela Schweitzer, Pharm.D., retired Rear Admiral (RADM), has more than 25 years of pharmacy, healthcare and health policy experience. RADM Schweitzer retired in 2018 following a four-year term as the Assistant Surgeon General and 10th Chief Pharmacist Officer of the United States Public Health Service (PHS). As Chief Pharmacist Officer (and the first female in this role), she was responsible for providing leadership and coordination of PHS pharmacy programs and professional affairs for the Office of the Surgeon General and the Department of Health & Human Services. She also serves on the Board of Directors of the National Council for Prescription Drug Program Foundation.

WILLIAM G. SHIELDS

Bill Shields is the retired CEO and current member of the Board of Directors at Advanced Infusion Solutions (AIS), the leading provider of advanced sterile, patient-specific intrathecal pump medications and in-home intravenous infusion including immune globulin therapies. He has a wide range of experience in leadership roles in the healthcare industry. Prior to joining AIS, he served as the President at MTS Medication Technologies, CEO at Artromick International, EVP at Amerisource, Bergen and President of PharMerica.

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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

Scott 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.

MARC WATROUS '91

Marc Watrous, R.Ph., Ph.D., is Senior Vice President of Managed Care and Customer Operations for Genentech. He and his team are responsible for the strategic approach and execution of pricing, distribution, reimbursement, and patient support for the company's portfolio. Since joining Genentech in 1997, Marc has also held leadership positions in the R&D Project Management and Portfolio Management units. His first role with Genentech was as a health economist.

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.