College of Pharmacy and Health Sciences

Russell J. DiGate, Dean, Ph.D.
Joseph M. Brocavich, Senior Associate Dean, B.S. Phm., Pharm.D.
Sawanee Khongsawatwaja, Associate Dean, B.A., M.S.
S. William Zito, Senior Associate Dean, B.S. Phm., Ph.D.
John Conry, Assistant Dean, B.S. Phm., Pharm.D.
Joseph V. Etzel, Assistant Dean, B.S. Phm., Pharm.D.
Tina Kanmaz, Assistant Dean, B.S. Phm., Pharm.D.
John-Emery Konecni, Assistant Dean, B.S., M.A., Ph.D.
S. Jennifer Miranda-Velázquez, Assistant Dean, B.S., M.S., P.D., Ed.D.
Janet E. Carl, Assistant to the Dean, B.A., M.S., P.D., Ed.D.
Michael Fahid, Assistant to the Dean, B.S.
Gina LaPan, Assistant to the Dean, B.A., M.S.
Anthony Marziliano, Assistant to the Dean, B.A., M.S.
Caitlin McElroy, Assistant to the Dean, B.A., M.S.
Sheila Edwards Robinson, Assistant to the Dean, B.S., M.S.W.

Objectives

The College of Pharmacy and Health Sciences seeks to prepare students to meet the present and future demand for pharmacists, physician assistants, clinical laboratory scientists, radiologic scientists and toxicologists to qualify them for their responsibility in matters of public health, to make them conscious of the opportunity to serve their fellow man, to emphasize the highly specialized professional service rendered to and for members of the other professions as well as to the public, to instill in the students appreciation of the ever-changing character of the health professions, to provide an opportunity for broad general education and to inspire students to pursue graduate study in specialized fields of interest.

The College of Pharmacy and Health Sciences has adopted the following Vision Statement: The College of Pharmacy and Health Sciences will be a nationally recognized center of excellence in undergraduate and graduate study in specialized fields of interest. It will maintain a commitment to cultural diversity and from the Vincentian Mission.

The following are emphasized in our various programs:

Pharmacy (Pharm.D.) Program:

Goal 1: Demonstrate core competencies as they relate to the field of pharmacy
- Demonstrate the ability to think logically, analyze information, problem solve and make decisions
- Discuss scientific methods in a competent manner
- Demonstrate effective written and oral communication skills
- Demonstrate the application of information systems and integrated computer technologies in the practice of pharmacy

Goal 2: Demonstrate Practice Competencies
- Demonstrate patient-centered care in cooperation with patients and other members of the health care team
- Evaluate the legal, ethical, social, cultural, economic and professional issues as related to patient specific care
- Participate actively in the drug use decision making process

Clinical Laboratory Sciences (CLS) Program:

Goal 1: Demonstrate basic knowledge of the field
Goal 2: Demonstrate competency in the biomedical sciences
Goal 3: Illustrate and apply the ethical principles of a laboratory professional

We commit ourselves to the discovery, communication and application of biomedical knowledge as a critical component for the development of health care professionals and scientists. Through innovative basic, social and clinical research initiatives, we contribute to scientific knowledge, address contemporary health care issues and seek solutions to health care problems.

Our mission embodies the principles of the University’s mission statement: to provide a quality education in an environment that is Catholic, Vincentian and metropolitan.
Goal 4: Communicate effectively both orally and in composition
Goal 5: Satisfy the objectives of the professional/clinical year
Goal 6: Demonstrate the fundamental competencies and application of skills of clinical laboratory sciences

Radiologic Sciences Program

Goal 1: Demonstrate clinical competency by mastering both the didactic and clinical portions of the program.
Goal 2: Exhibit professionalism and ethical conduct.
Goal 3: Effectively communicate in a professional manner.
Goal 4: Demonstrate critical thinking skills to obtain quality diagnostic images while ensuring patient safety and comfort.

Toxicology (TOX) Program

Goal 1: Demonstrate competency in science and math
Goal 2: Demonstrate the application of fundamental competencies in toxicology
Goal 3: Demonstrate skills in the practice of toxicology
Goal 4: Apply knowledge and skills to the public understanding of toxicology

Physician Assistant (PA) Program

Goal 1: Demonstrate basic competency in the field
Goal 2: Demonstrate knowledge of the biomedical sciences
Goal 3: Illustrate and apply the ethical principles of a health care practitioner
Goal 4: Demonstrate an understanding of medical knowledge
Goal 5: Demonstrate effective oral and writing skills
Goal 6: Demonstrate competencies and integration of clinical skills

General Entrance Requirements

16 High School Units or appropriate score on GED
English 4
History 1
Science 1 *
Foreign Language 2
Mathematics 3
Electives 5
At least three electives must be from the academic grouping.

*While the above are basic admission requirements, it is required that students

Admission Requirements

No student who, because of academic or disciplinary reasons, has been dismissed from or has been placed on probation in another school is eligible for admission to the College of Pharmacy and Health Sciences.

Admission to the Pharm.D. program is highly competitive and admission and scholarship criteria are determined each year on the strength of the applicant pool. All students must submit two letters of recommendation (one must be from a science or math teacher), complete an essay of 250 words, submit an extracurricular activities report, and a signed copy of the program’s Technical Standards.

Candidates for admission to the pharmacy program must be at least 16 years of age and must be graduates of a four-year accredited secondary school.

Admission of Transfer Students to Advanced Standing

Transfer students are admitted to the Pharm.D. on a space available basis only. Because of the extremely competitive entrance requirements and retention rate, this program has not admitted transfer applicants (internal or external) in recent classes. Transfer applicants must complete an in-person interview.

A student transferring from another college or university must present the following:
1. A statement of honorable withdrawal.
2. An official transcript of high school and college records.
3. A marked copy of the catalog of the college or university attending showing courses for which credits are sought.

Transfer students must meet University requirements in the areas of Philosophy and Theology.

Candidates for the Clinical Laboratory Sciences Program, Physician Assistant Program, Radiologic Sciences Program and Toxicology Program must meet the University requirements for Admission to Advanced Standing. Credit for comparable courses in the pre-professional sequence will be granted. No credit is allowed for professional courses taken in other than an affiliated institution.

Transfer students into the Physician Assistant Program are accepted on a space available basis, by vote of the admissions committee and only after completion of an in-person interview.

Degrees, Majors, and Minors Available

Doctor of Pharmacy Program

The entry-level Doctor of Pharmacy (Pharm.D.) degree is designed to develop students into competent pharmacists who possess the knowledge and skills needed to provide the highest quality of patient-centered medication therapy management. This curriculum provides students with a strong foundation in the liberal arts and sciences that is consistent with a strong academic program of study. The program is configured as a six-year course of study that admits students directly into the major without requiring the completion of a pre-pharmacy curriculum. Professional pharmacy coursework is introduced early in the program to increase the students’ awareness of their chosen profession. The final four years concentrate on integrating basic and applied pharmaceutical and clinical sciences in the classroom, lab and practice settings. The curriculum employs an integrated approach to learning, and stresses the application of knowledge that is patient specific and focused.

Graduates of this program are prepared to meet the challenges associated with becoming an effective practicing pharmacist and serve as experts in drug therapy to improve the use of medication for diverse populations.

Technical standards, as distinguished from academic standards, refer to the minimum cognitive, professional and behavioral abilities required for a student to satisfactorily complete all of the curriculum. To successfully progress in and ultimately complete the didactic, laboratory and experiential components of the Doctor of Pharmacy program, students must understand these qualifications. All students will be required to read and sign the technical standards document to indicate they understand these qualifications. The signed document will be kept as a permanent part of the student’s record.

Physician Assistant Program

The four-year program leading to a Bachelor of Science degree with a major in Physician Assistant consists of two academic years of collegiate instruction on the Queens campus, followed by 2 academic years at the Dr. Andrew J. Bartilucci Center. This accredited program provides the Physician Assistant Professional Credential concurrently with the conferment of the B.S. degree from St. John’s University.

Technical standards, as distinguished from academic standards, refer to the minimum cognitive, professional and behavioral abilities required for a student to satisfactorily complete of all essential aspects of the curriculum. Please visit the following website for full
Clinical Laboratory Sciences Program

This four-year program leading to a Bachelor of Science with a major in Clinical Laboratory Sciences degree consists of three years of pre-professional instruction and one year of NAACLS (National Accrediting Agency for Clinical Laboratory Sciences) approved professional/clinical study at the Dr. Andrew J. Bartilucci Center as well as the University’s hospital affiliates.

Technical standards, as distinguished from academic standards, refer to the minimum cognitive, professional and behavioral abilities required for a student to satisfactorily complete all essential aspects of the curriculum.

Radiologic Sciences Program

The Bachelor of Science in Radiologic Sciences is designed to prepare students for a career as a radiologic technologist. The curriculum is designed to develop and enhance effective communication skills, technical skills, and professionalism while inspiring excellence in practice. The junior and senior years of the program provides a balanced clinical education complimented with a didactic atmosphere conducive to fostering teamwork and self development to provide a foundation for academic and career advancement.

This four-year program consists of two years of pre-professional courses and two years of instruction at the Dr. Andrew J. Bartilucci Center and affiliate clinical sites.

Technical standards, as distinguished from academic standards, refer to the minimum cognitive, professional and behavioral abilities required for a student to satisfactorily complete all essential aspects of the curriculum.

Toxicology Program

Toxicologists work to protect human health and the environment from the adverse effects of harmful materials. Toxicology students take courses in chemistry, biology, physiology, and pharmacology in addition to diverse courses in toxicology. Students can participate in on-campus activities such as undergraduate research in faculty laboratories or become involved in the Toxicology Club.

The Toxicology Program is a four-year program providing a minor in chemistry. This major provides all of the requirements for admission to medical school. After graduation, students are qualified for jobs in biomedical or analytical laboratories as well as admission to medical and dental school and graduate programs.

Minors Approved for Pharmacy Students

Biology
Business
Chemistry
Philosophy
Psychology
Public Administration and Public Service
Sociology
Theology and Religious Studies

Minors Available for Health Sciences

(Clinical Laboratory Sciences, Physician Assistant, Toxicology, and Radiologic Sciences)

Business
Chemistry
Computer Science
English
Government and Politics
History
Philosophy
Psychology
Sociology
Theology

Certificate Program

Physician Assistant Certificate

Students who possess a bachelor’s degree may apply to the two-year, certificate portion of the program. Applications for the Certificate Program must be submitted online through the Central Application Service for Physician Assistants (CASPA). All Certificate students must possess a baccalaureate degree. Candidates also are encouraged to have a strong science background with completed coursework in pathology, biochemistry, pharmacology, ethics and biostatistics. Minimum requirements for all applicants include 16 credits in the basic sciences taken within five years of entry into this program. Courses include: Microbiology with lab, Anatomy and Physiology I and II with labs, and Chemistry with lab.

Academic Standing

Academic standing for consideration of progression within each program, progression on probation, or dismissal for poor scholarship is based on review of students’ progress. Additional standards for progression in each program must be met. Please contact the Office of the Dean for information concerning these requirements.

Pharmacy

Good academic standing for a student in the Entry Level Pharm.D. degree is a 2.3 overall GPA and math/science grade point average by the end of the first year which must be maintained throughout the remainder of the program.

A pharmacy major will be required to successfully complete a competency examination before beginning the advanced pharmacy experiential portion of the program. Students will also be interviewed prior to their third year and may be required to submit a writing sample for review.

Pass-Fail Option

This option is open only to health sciences students who have completed the freshman year and who have a current quality point index of at least 2.0. It is limited to one course per semester for a four-year degree program, the total during the three years, including summer sessions, may not exceed six courses. It may not be exercised in connection with major requirements or with courses being applied to a minor, including math, science, and professional courses. The quality point index will not be affected; however, a “Pass” will be credited toward the degree.

Application for the Pass-Fail Option must be made through UIS. A student may elect the Pass-Fail Option at any time during the semester up to and including the last date designated for withdrawal from class without academic penalty. Pharm.D. students do not have the Pass-Fail Option except in courses already designated as Pass-Fail.

Advanced Placement/CLEP

Upperclass students who wish to take CLEP or other credit-by-test exams must receive prior approval from the Office of the Dean if such credit is to be applied to the St. John’s degree. For information concerning the College Policy on AP credit, please contact the Office of the Dean.

The Radiologic Sciences degree program is accredited by the Joint Review Committee on Education in Radiologic Technology (www.jrcert.org).

The Radiologic Sciences degree program is accredited by the Accreditation Council for Pharmacy Education (www.acpe-accredit.org).

The Clinical Laboratory Science degree program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (www.naacs.org).

The Physician Assistant degree program is accredited by the Accreditation Review Commission on Education for the Physician Assistant (www.arc-pa.org).

Minors Approved for Pharmacy Students

Biology
Business
Chemistry
Philosophy
Psychology
Public Administration and Public Service
Sociology
Theology and Religious Studies

Minors Available for Health Sciences

(Clinical Laboratory Sciences, Physician Assistant, Toxicology, and Radiologic Sciences)

Business
Chemistry
Computer Science
English
Government and Politics
History
Philosophy
Psychology
Sociology
Theology

Certificate Program

Physician Assistant Certificate

Students who possess a bachelor’s degree may apply to the two-year, certificate portion of the program. Applications for the Certificate Program must be submitted online through the Central Application Service for Physician Assistants (CASPA). All Certificate students must possess a baccalaureate degree. Candidates also are encouraged to have a strong science background with completed coursework in pathology, biochemistry, pharmacology, ethics and biostatistics. Minimum requirements for all applicants include 16 credits in the basic sciences taken within five years of entry into this program. Courses include: Microbiology with lab, Anatomy and Physiology I and II with labs, and Chemistry with lab.

Academic Standing

Academic standing for consideration of progression within each program, progression on probation, or dismissal for poor scholarship is based on review of students’ progress. Additional standards for progression in each program must be met. Please contact the Office of the Dean for information concerning these requirements.

Pharmacy

Good academic standing for a student in the Entry Level Pharm.D. degree is a 2.3 overall GPA and math/science grade point average by the end of the first year which must be maintained throughout the remainder of the program.

A pharmacy major will be required to successfully complete a competency examination before beginning the advanced pharmacy experiential portion of the program. Students will also be interviewed prior to their third year and may be required to submit a writing sample for review.
Clinical Laboratory Sciences

Students are required to maintain a 2.30 overall GPA and a 2.30 math and science GPA for promotion within the major. For promotion into the clinical year, students are required to have a 2.30 GPA overall as well as in math and science. Students will be interviewed prior to entering the clinical year. Students must repeat a course when it is next offered if the letter grade of C+ is not achieved. If a student unsuccessfully completes the repeated course or is unsuccessful in achieving a C+ in more than one course, the student will be recommended for program dismissal.

Students are required to maintain a C+ or greater in each course of the professional program in order to graduate.

Physician Assistant

Students are reviewed each semester for the purpose of evaluating academic performance and ascertaining eligibility for promotion in their major. Advancement within the freshman and sophomore years requires a 2.70 math and science GPA and a 2.70 overall GPA each semester to be in good academic standing. Advancement into the junior year require a 2.70 math and science GPA and a 2.70 GPA overall, including a letter grade of C or better in the following: General Chemistry (CHE 1110/42 or CHE 1210/1/2), Anatomy and Physiology I and II including any labs (PHS 3103, PHS 3104, PHS 3105 or PHS 3504, 3507), Microbiology (BIO 2280/1), and Introduction to Health Care (ALH 1201). These courses must be completed within five years of entry into the junior year. Students must fulfill and pass all components of the progression application, including the GPA and letter grade requirements, and pass the required interview in order to be considered for progression to the junior year. The number of students advancing to the junior year is dependent upon the enrollment permitted by the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA).

Students enrolled in the junior and senior years of this major must earn a letter grade of C or better in all didactic courses with an overall 2.30 GPA. Students must repeat a course when it is next offered if the letter grade of C is not achieved. If a student receives less than the letter grade grade of C in more than one didactic course or a repeated course, this will lead to the recommendation for program dismissal. Didactic students must also competency exam before beginning clinical rotations. Students enrolled in clinical rotations must earn a letter grade of C+ or better for each clinical rotation.

Toxicology

Students are required to maintain a 2.30 overall GPA as well as in their math and science courses for promotion within their major each year.

Radiologic Sciences

Students must maintain a 2.30 overall GPA in the pre-professional courses each year to progress within their major. The 2.30 overall GPA is required for students to progress into the junior and senior years of the Radiologic Sciences program. Students must pass an interview prior to entering the professional year as part of their progression process.

Within the junior and senior years, students must maintain an overall GPA of 2.30, earn a letter grade of C+ or greater in each didactic and clinical course, and adhere to the attendance policy to progress from semester to semester.

Regulations on Discipline

New York State law provides for suspension or revocation of a license to practice the healing arts if, among other things, an individual is convicted of a crime or is a habitual drunker or has been addicted to, dependent on, or a habitual user of narcotics, barbiturates, amphetamines, hallucinogens, or other drugs having similar effects. In light of this statute, any student who, after appropriate procedures, is found to have violated University regulations and policies relating to drugs may be subject to dismissal from the College or be required to undergo rehabilitation before continuing progress toward a degree.

Special Requirements for Experiential Programs

Students in the Pharmacy, Clinical Laboratory Sciences, Physician Assistant, and Radiologic Sciences must complete annual criminal background checks and must be HIPAA certified.

Pharmacy students participating in experiential programs are required to have a medical examination, an immunization series, health insurance, accident and sickness insurance.

Additionally, these students must purchase medical liability insurance through the University, and must complete PHR 5000.* Pharmacy students may not take an elective or didactic course concurrently with the advanced experiential courses, Clinical Laboratory Sciences, Physician Assistant and Radiologic Sciences students may take an elective or didactic course in concurrently with the clinical rotation courses.

In the Clinical Laboratory Sciences, Physician Assistant and Radiologic Sciences Programs, students entering the hospitals for the professional years are required by the hospital to have a medical examination and to carry adequate accident and sickness insurance for the duration of their professional studies. Additional requirements may be stipulated by the hospitals or healthcare institutions.

Pharmacy, Clinical Laboratory Sciences, Physician Assistant and Radiologic Sciences program students must register at the University for each semester that they are at the clinical site and pay full tuition.

* Experiential Rotations are restricted to Pharm.D. students.

Pharmacy Intern Permit

Students who complete the third year and who are to participate in experiential rotations are required to obtain a New York Pharmacy Intern Permit. Completed applications that have been signed by a College administrator must be forwarded by the student to the New York State Board of Pharmacy after completion of the third year of the program.

Licensure

Admission to the Practice of Pharmacy

The Pharmacy program offered by the College of Pharmacy and Health Sciences meets the educational requirements for admission to state licensing examinations. Each state may require, in addition to academic work, a period of internship. When these and other requirements which have been established by the State have been met, the applicant is admitted to the state licensing examination. Successful candidates are granted a license to practice. For information concerning the admission to the practice of pharmacy, write: New York State Board of Pharmacy, 89 Washington Avenue, 2nd Floor, Albany, NY 12234.

Clinical Laboratory Sciences

Successful completion of the professional component of Clinical Laboratory Sciences education allows the student to apply for admission to the American Society for Clinical Pathology (ASCP) certifying exam. Successful completion of the courses leading to a BS degree and passing of the ASCP certifying examination allows the graduates to obtain a New York State Department of Education license to practice as a Clinical Laboratory Technologist.

Physician Assistant Certification

Successful completion of the Physician Assistant didactic and clinical years makes the graduate eligible for admission to the Physician Assistant National Certifying Examination as administered by the National Commission on Certification of Physician Assistants.
Radiologic Sciences Certification

Students that have completed the professional component of Radiologic Sciences education with the B.S. program are eligible to apply for admission to the to the American Registry of Radiologic Technologists exam in Radiography and the New York State Licensing Examination.

Continuing Professional Education

William Malone, B.S., M.S. Director
The Office of Continuing Professional Education’s core activities which are ACPE approved programs directed toward providing pharmacists and allied health professionals with the opportunities to increase their knowledge and skills with value-based programs that contribute to their professional achievement. Seminars cover a wide variety of topics including therapeutics, managed care, administration and industrial development, and address topical concerns of the current practitioner. Where appropriate, these programs are submitted for approval to the various states requiring continuing education credits for relicensure. For more information regarding programs, the office may be reached by phone at (718) 990-5796 or e-mail at pharmacyce@stjohns.edu

The Health Education Resource Center (HERC)

Jaclyn Vialet, M.L.S., Director
(HERC) is open weekdays in the Sister Jane M. Durgin Pharmacy Education Center of St. Augustine Hall, Room B40. This instructional resource center provides educational and technical services to support the course objectives of the College of Pharmacy and Health Sciences. The center features a specialized collection consisting of books, periodicals, media, and electronic resources in the primary subject specialties of pharmacy and health sciences. The students, faculty, alumni, and practitioners of the college are also provided with a number of services at the center, which include: reference and research support, document delivery, public work stations, and quiet study areas. The center also sponsors educational programs, led by leaders from the fields of pharmacy and health sciences, which focus on contemporary healthcare issues.

Affiliate Clinical Pharmacy Sites

Pharmacy Clinical Coordinators:
Philip McAvoy, B.S. Pharm., Pharm.D., M.S.
Frank Nania, B.S. Pharm., Pharm.D.
Andrea Watson, B.S. Pharm., Pharm.D.
Elizabeth Murray,

American Regent, Inc.
Americare Pharmaceutical Services
Annadale Family Pharmacy
Avanti Health Care (Alexander Infusion)
Belle Harbor Chemists
Bellevue Hospital Center
Best Care Pharmacy
Beth Israel Medical Center
BioScrip Inc.
Bonus Drugs and Surgical
Brookhaven Memorial Hospital
Bryce RX Laboratories, Inc.
Cardinal Health Nuclear Pharmacy Services
CareMed Pharmacy
Center for Extended Care and Rehabilitation
Cherokee Indian Hospital
Clinton Apothecary
Coler-Goldwater Specialty Hospital and Nursing Facility
Colombo Pharmacy
Commmack Drug and Surgical
Coney Island Pharmacy
CVS Caremark
Dale Drugs
Drug Rite II Pharmacy
Drug Town Pharmacy
Duane Reade
Echo Drugs/Surgical Supplies
Eisai, Inc.
Elite Pharmacy Consulting
Elmhurst Hospital
Emblem Health Pharmacy Services
Fidelis Care New York
Finch's Drug, Inc.,
Food and Drug Administration
Franklin Hospital
Franklin Square Pharmacy
Franwin Pharmacy
Good Samaritan Hospital
Greater New York Hospital Association
Greenwich Hospital
Guardian Consulting Services
Gurwin Jewish Nursing and Rehabilitation Center
Hackensack University Medical Center
Hamilton Park Rehabilitation and Nursing Center
HealthMart Pharmacy
Health Smart Pharmacy
Hill Pharmacy (65 Place)
Hoboken University Medical Center
Hospital for Special Surgery
Huntington Hospital
Integrated Health Algorithms
Jacobi Medical Center
Jamaica Hospital Medical Center
Jayson Drugs
Jewish Home Lifecare
John T. Mather Memorial Hospital
King Kullen Pharmacy
Lawrence Hospital
Levin’s Pharmacy, Inc.
Lincoln Medical and Mental Health Center
Little Neck Drug Store
Long Beach Medical Center
Long Island College Hospital
Long Island Jewish Medical Center
Lutheran Medical Center
Maxor National Pharmacy Services Corp.
Medco Health Solutions
Med-World Pharmacy
Melrose Pharmacy
Mercy Medical Center
Montefiore Medical Center
Nassau University Medical Center
Nate’s Specialty Pharmacy
Neergaard’s Pharmacy
New London Pharmacy
New Victory Pharmacy
New York City Poison Control Center
New York Methodist Hospital
NY Presbyterian-Columbia Presbyterian Medical Center
NY Presbyterian-The NY Hospital of Cornell
North Central Bronx Hospital
North Shore University Hospital
Northport VA Medical Center
Nuclear Diagnostic Products of LI NYHTC and HANYC Harlem Health Center.
NYS Council of Health-System Pharmacists
NYU Langone Medical Center
Palisades Medical Center-NY Presbyterian Healthcare System
Parker Jewish Institute for Health Care and Rehabilitation
Pathmark Pharmacy
PDR.Net (Physicians’ Desk Reference)
Peconic Bay Medical Center
PetNet Pharmaceuticals, Inc.
Pfizer Pharmaceuticals
Phelps Memorial Hospital
Precision Long Term Care (Great Neck Chemists)
Queens Children’s Psychiatric Center
Queens Hospital Center
Region Care
Rite Aid Pharmacy
Rock Ridge Pharmacy
Rockville Centre Pharmacy
Rockwell Compounding
Rocky Hill Pharmacy
RX Plus Pharmacy
S and M Pharmacy

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Salzman Chemists
Sara Neumann Nursing Center
Sedgwick Pharmacy
Sentrix
Shop Rite Pharmacy
Shore Pharmaceutical Services, Inc.
Silver Rod Pharmacy
Sound Shore Medical Center of Westchester
South Nassau Communities Hospital
South Oaks Hospital/Broadlawns Manor Nursing Care Center
Southampton Hospital
Southside Hospital
St. Catherine of Sienna Medical Center
St. Charles Hospital
St. Francis Hospital
St. John’s Episcopal Hospital
St. John’s Riverside Hospital
St. Joseph Hospital
St. Mary’s Hospital for Children
Stella’s Pharmacy
Stonebridge Pharmacy and Medical
Sunrise Pharmacy
Target Pharmacy
The Burke Rehabilitation Hospital
The New York Hospital Medical Center of Queens
The Valley Hospital
Thrift Drugs
Tower Drugs - North Shore
Town Drug
Town Total Health
Town Total Nutrition, Inc. Melville
Triad Isotopes (Mallinckrodt Inc.)
Trinity Homecare Option Care/Walgreens Company
University Hospital at Stony Brook
VA Hudson Valley Health Care System
Valley Hospital (Lukow Pavillion)
Village Pharmacy
Waldbaums Pharmacy
Walgreens Pharmacy
Wal-Mart Stores, Inc.
Watson Pharmaceuticals, Inc.
Waynes Pharmacy
West Hempstead Pharmacy
Westchester Medical Center
Winthrop University Hospital
World’s Fair / Total Care Rx
Zive Pharmacy and Surgicals

Affiliated Allied Health Sites
Clinical Laboratory Sciences
Usha Ruder, M.D., Medical Advisor
Lisa Hochstein, B.S., M.S., M.L.S. (ASCP),

Program Director
(sites subject to change)
Flushing Hospital and Medical Center
Jamaica Hospital and Medical Center
Long Island Jewish Medical Center
New York Hospital of Queens
North Shore – LI Health System Labs
St. Francis Hospital
Winthrop University Hospital
Wyckoff Heights Medical Center

Physician Assistant Program
Vincent Politi, M.D., Medical Director
Sandra Beysoylov, B.S., M.S. Ed., Program Director
(sites subject to change)
Beth Israel Medical Center
Coney Island Hospital
Flushing Hospital
Glen Cove Hospital
Jamaica Hospital
Kingsbrook Jewish Hospital
Lincoln Hospital
Long Island Jewish Hospital
Mount Sinai Medical Center
North Central Bronx Hospital
North Shore Forest Hills Hospital
North Shore Manhasset
St. Francis Hospital
Winthrop Medical Center
Wyckoff Heights Medical Center

Radiologic Sciences Program
Jennifer Chiu, B.S., M.B.A, Program Director
(sites subject to change)
Dosh Diagnost Imaging Services
Flushing Imaging Center Central Radiology
Kingsbrook Jewish Medical Center
New York Hospital Medical Center of Queens
Wyckoff Heights Medical Center
Winthrop University Hospital

Endowed Scholarships, Awards and Honors
Through the generosity of our alumni, friends and benefactors, the College is fortunate to offer a number of endowed scholarships. Some of these endowments include the following:

L.W. Frohlich Scholarship
E. Burke Giblin Scholarship
Charles Mollo Scholarship
Sandy Irene and Family Scholarship
Vincenzo James Mantia Scholarship
Andrew Bartilucci Clinical Laboratory Sciences Award
Michael W. Seul Scholarship
Charles and Winifred Jarowski Research Endowment
Phi Eta Sigma Scholarship
Scheer Family Scholarship
Mary-Beth Konescki Scholarship
Peter J. Ateno Memorial Scholarship
David R. Wilkes Scholarship
Herbert J. and Patricia Marie Kett Scholarship
Marion and Michael Mangione Memorial Scholarship
Duane Reade Scholars Endowed Scholarship
Mitchell S. Kraus Memorial Scholarship
Mary Jane Fay Pharmacy Scholarship

The following awards may be available to students:
American Pharmaceutical Association
American Pharmaceutical Association Certificate of Recognition
ASHP Student Leadership Award
Auxiliary of the Pharmacists’ Society of the State of New York Scholarship
Aventis Scholarship
Andrew J. Bartilucci Clinical Laboratory Sciences Award
Andrew J. Bartilucci Scholarship Award
Academic Student Organizations

Pharmacy Honor Society
The Beta Delta Chapter of the Rho Chi Society, a pharmacy leadership society, seeks to promote the development of leadership qualities in pharmacy students. With the fundamental assumption that leaders are made not born, the Society encourages participation in all pharmacy activities, provides opportunities for leadership development, and aids in selecting those who may wish to identify and demonstrate their leadership abilities. Pharmacy students who have achieved fourth-, fifth-, and sixth-year status, who have a cumulative quality point index of 3.5 or better and are in the top 20% of the class are eligible for nomination to membership.

Pharmacy Leadership Society
The Xi Chapter of Phi Lambda Sigma, a pharmacy leadership society, seeks to promote the development of leadership qualities in pharmacy students. With the fundamental assumption that leaders are made not born, the Society encourages participation in all pharmacy activities, provides opportunities for leadership development, and aids in selecting those who may wish to identify and demonstrate their leadership abilities. Pharmacy students who have achieved fourth- or fifth-year status, who have a cumulative quality point index of 2.5 or better and who have been nominated on the basis of their demonstration of dedication, service and leadership in the advancement of pharmacy are eligible for membership.

Physician Assistant Honor Society
The Pi Alpha Honor Society is the national physician assistant honor society established in 2003 by the Physician Assistant Education Association (PAEA) to promote and recognize PA students for academic excellence and leadership skills, professionalism, research and service to the profession and the medical community. Student membership is awarded on a competitive basis to graduating seniors and demonstrated their leadership abilities. Pharmacy students who have achieved fourth-year status, who have a cumulative quality point index of 3.5 or higher and possession of service or research qualifications.

Clinical Laboratory Sciences Honor Society
The Sigma Upsilon Chapter of the Lambda Tau, the national clinical laboratory sciences honor society, was established to recognize outstanding academic achievement among students, to develop a spirit of cooperation and unity among the students entering this profession, to encourage research and to help develop the professional character of the profession itself and to interest other students in this profession. Juniors and seniors with a GPA of 3.0 or higher are eligible for induction into this honor society.

Program Requirements

Entry Level Pharm.D.
(Minimum of 201 semester hours)

The faculty expressly reserves the right to make alterations in the curriculum consistent with the needs of the profession.

First Year

Fall Semester Credits.
ENG 1000C 3
THE 1000C* 3
CHE 1110, 1111, 1112 4
MTH 1250 3
DNY 1000C 3
PHR 1000 0
TOTAL 16

Spring Semester
ENG 1100C* 3
THE 2000-2999 3
CHE 1120, 1121, 1122 4
MTH 1260 3
PHI 1000C 3
CPP 1101 1
TOTAL 17

Second Year

Fall Semester
THE 3300* 3
PHI 2240* 3
BIO 2000 3
CHE 1130, 1131, 1132 4
SPE 1005C 3
PAS 2301 1
TOTAL 17

Spring Semester
PHI 3000C 3
PAS 2201 3
PH 3504 3
PHI 2101 3
PHS 2201 4
PHS 2301 1
TOTAL 17

Third Year

Fall Semester
PHS 3601 4
PHS 3507 3
[PHS 3505 2]
[PHS 3506 2]
PAS 3301 3
CPP 3201 2
PHS 3602 1
PHS 3302 1
TOTAL 18

Spring Semester
PHS 3603 4
[PHS 3508 2]
[PHS 3509 2]
PHS 3510 3
CPP 3202 2
PHS 3604 1
PHS 3303 1
Elective 2
TOTAL 17

Note: *These courses will be taught both semesters.
Fourth Year

Fall Semester

- [PHR 4105 4]
- [PHR 4109 3]
- [PHR 4110 3]
- PHS 4601 3
- CPP 4301 2
- PHR 4201 1
- TOX 5301 2

TOTAL 18

Spring Semester

- [PHR 4107 3]
- [PHR 4111 3]
- [PHR 4112 4]
- PHS 4602 3
- PAS 4305 2
- PHR 4202 1
- CPP 4402 2

TOTAL 18

Fifth Year

Fall Semester

- [PHR 5108 4]
- [PHR 5106 3]
- [PHR 5107 3]
- PAS 5202 4
- PHR 5201 1
- CPP 5301 3
- PHR 5000+ 0

TOTAL 18

Note: The bracketed courses will be taught sequentially.

+Course required for APPE’s.

Spring Semester

Module Rotations 12
- CPP 5202 4

TOTAL 16

Sixth Year

Fall Semester

Module Rotations 15

There are a total of nine APPE rotations in the entry-level Doctor of Pharmacy Program. The rotations are divided in four-week blocks at three credits each. Of the nine rotations only the externships are required in the fifth academic year. The rotations are as follows:

Required Rotations
1. CPP 5412 Key Concepts in the Provision of Pharmacist-Delivered Care
2. CPP 5413 Advanced Community Pharmacy
3. CPP 5414 General Inpatient Care
4. CPP 5407 Ambulatory Care Clerkship
5. CPP 5415 Specialty Inpatient Care

Elective Rotations
1. CPP 5404 Elective Clerkship I
2. CPP 5408 Elective Clerkship II
3. CPP 5409 Elective Clerkship III
4. CPP 5410 Elective Clerkship IV

Spring Semester

- CPP 6101 3
- CPP 6102 3
- PHR 6101 2
- Professional Elective 3
- Professional Elective 3

TOTAL 14

Clinical Laboratory Sciences

(Minimum of 138 semester hours)

The faculty expressly reserves the right to make alterations in the curriculum consistent with the needs of the profession.

First Year

Fall Semester Credits.
- ENG 1000C 3
- MTH 1250C 3
- CHE 1110, 1111, 1112 4
- BIO 2000 3
- BIO 2001 1
- DNY 1000C 3

TOTAL 17

Spring Semester

- ENG 1100C 3
- MTH 1260C 3
- CHE 1120, 1121, 1122 4
- TOX 1401 3
- TOX 1402L 1
- PHI 1000C 3

TOTAL 17

Second Year

Fall Semester

- CHE 1130, 1131, 1132 4
- PHY Elective 3
- THE 1000C 3
- PHI 2200/2240 3
- BIO 2280, 2281 4

TOTAL 17

Spring Semester

- BIO 3460, 3461 4
- ALH 2101 3
- THE 2XXX 3
- PHI 3000C 3

TOTAL 15

Third Year

Fall Semester

- TOX 4413 3
- TOX 4414 2
- PHS 3103 3
- PHS 3104 1
- THE 3XXX 3
- SPE 1000C 3
- Language I or LAC 1000C 3

TOTAL 18

Spring Semester

- Social Science Elective 3
- PHS 3105 3
- PHS 3101 3
- PHS 2101 3
- Language 2 or Fine Arts 3
- HIS 1000C 3

TOTAL 18

Fourth Year

Summer Semester*

- ALH 4140 2

Fall Semester

- ALH 4151 3
- ALH 4152 1
- ALH 4153 2

TOTAL 14

ALH 4154 3
ALH 4155 4
ALH 4156 2
ALH 4157 2
TOTAL 17

Spring Semester

- ALH 4161 3
- ALH 4162 1
- ALH 4163 2
- ALH 4164 2
- ALH 4165 4
- ALH 4166 2
- ALH 4167 2
- ALH 4168 1

TOTAL 17

* STJ summer tuition applies

Toxicology

(Minimum of 127 semester hours)

The Toxicology Program continues undergoing revision. The faculty expressly reserves the right to make alterations in the curriculum consistent with the needs of the profession.

First Year

Fall Semester Credits.
- ENG 1000C 3
- MTH 1250C 3
- CHE 1210, 1211, 1212 5
- BIO 2000 3
- BIO 2001 1
- DNY 1000C 3

TOTAL 18

Spring Semester

- MTH 1260C 3
- CHE 1220, 1221, 1222 5
- TOX 1401 3
- TOX 1402L 1
- ENG 1100C 3

TOTAL 15

Second Year

Fall Semester

- CHE 2230, 2231 5
- PHY 1610, 1611, 1612 4
- TOX 2403 3
- PHS 3104 1
- PHS 3103 3

TOTAL 16

Spring Semester

- CHE 2240, 2241 5
- PHY 1620, 1621, 1622 4
- TOX 2403 3
- PHS 3105 3
- PHI 1000C 3
- THE 1000C 3

TOTAL 18

Third Year

Fall Semester

- PHS 3101 3
- TOX 3405 4
- PHS 2200/2240 3
- HIS 1000C 3
- THE 2XXX 3

TOTAL 16
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* STJ summer tuition applies
Pharmacy Course Offerings (PHR)

1000 Introductory Seminar for Pharmacy Students
This mandatory seminar course will introduce all new students to the activities, responsibilities and requirements for students enrolled in Doctor of Pharmacy Program. During this course, areas such as an overview of the curriculum, advisement, experiential and academic service learning, professionalism and legal and technical standards required for degree completion will be presented. Completion of this seminar is required for enrollment in CPP 1101 in the Spring semester. Lecture: Credit: 0 semester hour.

4105 Drugs and Infectious Diseases
Prerequisites: ALL courses of the first three years. This course is designed to instruct the student in the area of infectious diseases. Teaching emphasis will be a sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Credit: 4 semester hours.

4112 Drugs and Diseases of the Nervous System
Prerequisites: ALL courses of the first three years. This course is designed to instruct the student in the area of neurological and psychiatric disorders. Teaching emphasis will be a sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Credit: 4 semester hours.

4109 Drugs and Diseases: Skin, Connective Tissue, and Miscellaneous Diseases
Prerequisites: ALL courses of the first three years. This course is designed to instruct students in the area of diseases of the skin and connective tissue, with additional focus on miscellaneous disease states including anemias, some coagulation disorders and glaucoma. Teaching emphasis will be sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Credit: 3 semester hours.

4110 Drugs and Diseases of the Cardiovascular/Renal Systems I
Prerequisites: ALL courses of the first three years. This course is designed to instruct the student in the areas of cardiovascular and kidney disease and electrolyte imbalances. Teaching emphasis will be a sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Credit: 3 semester hours.

4111 Drugs and Diseases of the Cardiovascular/Renal Systems II
Prerequisites: ALL courses of the first three years; PHR 4110. This course is designed to instruct the student in the area of cardiovascular and kidney disease. Teaching emphasis will be a sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Credit: 3 semester hours.

4201 Pharmacy Practice Laboratory III
Prerequisites: ALL required third-year course work. Corequisites: PHR 4105; PHR 4109; PHR 4110; PAS 4303. This laboratory will integrate the didactic coursework of the Drugs and Diseases courses and Extemporaneous Compounding and provide the student the opportunity to apply data in a simulated pharmacy setting. The student will assess patient findings, evaluate new prescription orders, and consider how these new orders will impact on current therapy, prepare the new order, and address any and all potential problems that are identified, and dispense the preparation to the patient. Additionally, students will learn to triage patients and assess the role of over-the-counter medications in light of other patient factors. Laboratory: 3 hours. Credit: 1 semester hour.

5000 Cardiopulmonary Resuscitation Techniques and First Aid
This Standard First Aid course provides the student with the basic principles of cardiopulmonary resuscitation (CPR) and leads to CPR and first aid certifications. Certification must be obtained prior to the advanced experiential rotations. Lecture: one 5-1/2 hour course. Credit: 0 semester hour.

5106 Drugs and Diseases of the Endocrine and Reproductive Systems
Prerequisites: ALL courses of the first four years. This course is designed to instruct the student in the area of endocrine and reproductive disorders. Teaching emphasis will be sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Credit: 3 semester hours.

5107 Drugs and Diseases of the Gastrointestinal and Genitourinary Tracts
Prerequisites: ALL courses of the first four years. This course is designed to instruct the student in the area of diseases of the gastrointestinal and genitourinary tract. Teaching emphasis will be sequential method of instruction relevant to specific disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapies. This course will incorporate interdisciplinary instruction utilizing faculty with varied areas of expertise and experience. Credit: 3 semester hours.

5108 Drugs and Neoplastic and Associated Diseases
Prerequisites: ALL courses of the first three years. This course is designed to instruct the student in the area of neoplastic disorders. Teaching emphasis will be a sequential method of instruction relevant to specific disease states.
to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, therapeutics, and self care therapeutics. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience.  

Credit: 4 semester hours.

5201 Biomedical Laboratory IV  
Prerequisites: ALL courses of the fourth year; PHR 4202. Corequisites: PHR 5108; PHR 5106; PHR 5107. Demonstration and experimentation of basic principles of medicinal chemistry, pharmacology, Toxicology, and biotechnology. Laboratory: 3 hours. Credit: 1 semester hour.

6101 Basic Concepts and Clinical Application of Nutraceuticals  
Prerequisites: ALL courses through the fifth year. This course will address the basic issues of development, modes of administration, efficacy, and marketing of nutraceuticals—foods or parts of foods and chemical components of foods, which provide medical benefits including the prevention and/or treatment of disease. In addition, vitamins, minerals, and other dietary supplements will be discussed in terms of their role in contributing to or maintaining health. The role and status of herbal products, nutritional supplements and nutropathies as alternative therapies to mainstream medicine will also be covered.  

Credit: 2 semester hours.

6102 Basic Concepts and Clinical Application of Nutraceuticals  
Prerequisites: ALL courses through the fifth year. This course will address the basic issues of development, modes of administration, efficacy, and marketing of nutraceuticals—foods or parts of foods and chemical components of foods, which provide medical benefits including the prevention and/or treatment of disease. In addition, vitamins, minerals, and other dietary supplements will be discussed in terms of their role in contributing to or maintaining health. The role and status of herbal products, nutritional supplements and nutropathies as alternative therapies to mainstream medicine will also be covered.  

Credit: 3 semester hours.

6103 Leadership Development in Pharmacy Practice  
Prerequisites: All professional courses through the fifth year. This professional elective course provides leadership, professionalism and political advocacy development for pharmacy students. Students explore how they can become better leaders and advocates of change within the profession. Through the use of interactive lectures, self assessment exercises and group projects, students gain an understanding of leadership theory and advocacy skills that will be applied to current health care and pharmacy practice issues.  

Lecture, 3 hours. Credit: 3 semester hours.

6104 Critical Care  
Prerequisites: All courses through the fifth year. This course focuses on the therapeutic management of patients in the critical care setting. Emphasis will be placed on the pathophysiology of acute illnesses as well as on rational treatment modalities and therapeutic drug monitoring of critically ill patients. Each of the disease states and pharmacotherapeutic topics discussed will be reinforced through the use of related clinical care studies.  

Credit: 3 semester hours.

Clinical Pharmacy Practice  
Course Offerings (CPP)  
Candace Smith, Pharm.D., Chair

Objectives  
The department seeks to provide students with the opportunity to acquire the knowledge, develop the attitudes and master the skills required for contemporary clinical pharmacy practice. Lectures, utilization of the multi-media programs in the Resource Center, and individual and group conferences with faculty and preceptors give the student the opportunity to acquire the knowledge base required to be a drug advisor on the health care team. 

By participation in health care settings throughout the curriculum and through interactions with patients, physicians, nurses, paraprofessionals and pharmacists, assistance is given to the student to develop the professional attitudes and acquire the communication techniques and skills that are prerequisites for health practitioners who wish to apply academic knowledge to practical situations.  

Utilization of the Pharmacy Practice and Patient Assessment Laboratories and primary health care settings, including community pharmacies, allows the student to become familiar with the legal, administrative and clinical aspects of successful pharmacy practice. In addition, other clinical training sites are utilized as resources for student instruction in therapeutic drug monitoring, provision of drug information and patient interviewing and education. These include major metropolitan area medical centers, community hospitals and clinics, and institutions emphasizing the care of specific patient populations (e.g., pediatric, psychiatric, geriatric care).

1101 Introduction to Pharmacy Practice  
Prerequisite: PHR 1000. This course is designed to provide the student with an overview of the pharmacy profession and contemporary practice issue. Focus is drawn to analysis of the attributes of the pharmacy profession, expectations and realities of a pharmacy student and pharmacist, and the concept of pharmaceutical care. Also, emerging and unique roles of the pharmacist on the health care team is discussed. Given on a Pass/Fail basis. Lecture. Credit: 1 semester hour.

3153 Introduction to Alternative Medicine  
Prerequisites: CPP 1101, PAS 2301. This course is intended to provide an introduction to the origin, basic principles, indications and philosophy of selected alternative medicine modalities. Elective. Credit: 2 semester hours.

3201 Introduction to Pharmaceutical Care  
Prerequisites: PHS 2101. This course is designed to introduce the student to the concept of pharmaceutical care. Pharmaceutical care embraces the concept of pharmacist-managed/patient-oriented pharmacy services directed at providing effective, safe, and cost effective drug therapy via outcomes monitoring and assessment. Selected disease states will be discussed with emphasis on pathophysiology and rational therapy and the development of an appropriate pharmacy care plan.  

Credit: 2 semester hours.

3202 Experiential Pharmacy I  
Prerequisites: CPP 3201; PAS 3301. This course is designed to transition the student from didactic training to experiential training; to allow the student to apply the skills and knowledge acquired thus far to the process of prescription preparation and the practice of patient care. The major goal of this course is to foster professionalism within the student, towards their patients, other healthcare professionals, and the profession and to apply didactic knowledge. The student will work under the supervision of pharmacy preceptors from affiliated practice sites who will assist them in the growth of their patient care skills and to guide them through the experiential process. This course will introduce the student to the medication dispensing process, including patient medication profiles, to drug use reviews/ evaluations, and to patient counseling in accordance to state and federal regulations guiding pharmacy practice. The student will also be exposed to the administrative, financial, and clinical activities that pharmacists routinely perform during the practice of the profession.  

Experiential Hours: Total 104 experiential hours (one eight hour day per week for 13 weeks)  
Credit: 2 semester hours.

3951 Research in Clinical Pharmacy I*  
Students participate in clinical research studies under the direction of clinical faculty. Permission for student participation must be obtained from a clinical faculty member prior to course registration. Credit: 3 semester hours.

3154 Community Health Advocacy and Outreach  
Prerequisites: All courses through the second year of study. This course explores the important role of pharmacists in community health. It provides a competency understanding of key concepts related to pharmacy initiatives for, and contributions to, patient advocacy,
education and outreach. Students will work together on assignments and engage in various community outreach programs, emphasizing the value of pharmacists participation in community health interventions. Credit: 3 semester hours.

3952 Research in Clinical Pharmacy II* Prerequisite: CPP 3951. Opportunity for students to continue clinical research activities or undertake additional projects. Same requirements as stated in CPP 3951 description. Credit: 3 semester hours.

4301 Drug Information and Laboratory Prerequisites: CPP 3201; HBS 3508; HBS 3509. The philosophy and fundamentals of drug information practice and the application of drug information skills in the delivery of pharmaceutical care will be discussed. The student will acquire the basic skills necessary for the provision of drug information through lectures, homework, and laboratory project assignments in the areas of drug information retrieval, drug literature evaluation, and quality assurance. Laboratory: 1 hour. Credit: 2 semester hours.

4402 Literature Evaluation and Research Design Prerequisite: CPP 4301. Literature evaluation and research design will provide the student with a basic understanding of appropriate research design and methodology, biostatistics, and reporting of results. The objective of this course is to provide the student with the skills and knowledge base to critically evaluate the primary literature and understand the practical implications of such literature. Credit: 2 semester hours.

5202 Experiential Pharmacy II Prerequisites: CPP 3202. This course will build upon Experiential Pharmacy I, transitioning and developing the skills of the student to become a more active participant in the healthcare delivery system for both the institutional and community settings. The goals of this course include continuing to develop professionalism within the student and applying the knowledge and skills gained thus far to the provision of patient care. The student, under the supervision of pharmacy preceptors from affiliated practice sites, will actively become involved in preparing prescriptions for the patient, utilizing and evaluating the patient medication profile, participating in quality assurance activities, and actively develop patient counseling skills. They will be exposed to all aspects of medication therapy management, including administrative, financial and clinical activities. Experiential Hours: 208* hours experiential off-campus hours. Credit: 4 semester hours.

*This is a longitudinal pharmacy practice learning experience. It will begin in fall of 4th year and must be completed by fall of 5th year. Scheduling of hours will be at the discretion of the pharmacy preceptor from the affiliated pharmacy practice sites and the student. A formalized schedule will be prepared by the College to assist with student scheduling.

5301 Clinical Applications of Pharmacokinetics and Pharmacodynamics Prerequisite: PHS 4601. This course is designed to explore prevailing topics in the areas of applied clinical pharmacokinetics, pharmacodynamics, toxicokinetics and include some aspects of special drug delivery systems. Application of advanced pharmacokinetic principles will be covered including examples of drugs and exhibit linear and non-linear pharmacokinetics. Clinically relevant pharmacodynamic principles will be covered. Principles and physio-chemical properties of drugs removed by extracorporeal systems will be discussed. Credit: 3 semester hours.

5404 Elective I Clerkship Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. This rotation will introduce the student to a specialized area of pharmacy practice. This area may be selected according to the student’s interest or an area of medicine in need of further emphasis. This rotation may involve managerial aspects of pharmacy practice or research pertaining to pharmacy practice. Credit: 3 semester hours.

5407 Ambulatory Care Clerkship Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. This course is an experiential rotation that is intended to expose the student to various aspects of clinical pharmacy practice in the outpatient setting. Under the direct guidance of an approved preceptor, the student will function as an integral member of the health care team by providing pharmaceutical services to ambulatory patients in accordance with the concept of total patient care. The clinical activities will emphasize the development of the pharmacist-patient relationship and will include various aspects of preventative medicine, patient education, and outcomes assessment. Credit: 3 semester hours.

5408 Elective II Clerkship Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. This rotation will introduce the student to a specialized area of pharmacy practice. This area may be selected according to the student’s interest or an area of medicine in need of further emphasis. This rotation may involve managerial aspects of pharmacy practice or research pertaining to pharmacy practice. Credit: 3 semester hours.

5409 Elective III Clerkship Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. This rotation will introduce the student to a specialized area of pharmacy practice. This area may be selected according to the student’s interest or an area of medicine in need of further emphasis. This rotation may involve managerial aspects of pharmacy practice or research pertaining to pharmacy practice. Credit: 3 semester hours.

5410 Elective IV Clerkship Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. This rotation introduces the student to a specialized area of pharmacy practice. This area may be selected according to the student’s interest or an area of medicine in need of further emphasis. This rotation may involve managerial aspects of pharmacy practice or research pertaining to pharmacy practice. Credit: 3 semester hours.

5412 APPE Key Concepts of Pharmacist-Delivered Care Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. During this advanced pharmacy practice experience (APPE), the student will transition from Introductory Pharmacy Practice Experiences (IPPE’s) to APPEs. Students will build upon the knowledge and skills acquired during their IPPE training, to provide patient-centered care in any direct patient care setting. Students are expected to provide this care in collaboration with the patient, their preceptor and healthcare providers. Students will utilize resources of the health care system to maximize therapeutic outcomes and medication use. Emphasis will be placed on further refining the student’s care planning process, drug information skills and medication safety concepts in a direct patient care setting. Credit: 3 semester hours.

5413 Advanced Community Pharmacy Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. During this advanced practice experience (APPE), the student will continue to demonstrate the skills to provide pharmacist-delivered patient-centered care in the community pharmacy setting. Students are expected to be active members of the healthcare team by participating in medication therapy management services, patient education, health screening/monitoring, and other advanced clinical services offered at the site. Emphasis will be placed on communication skills, patient education, and the pharmacist’s role in maximizing population –based therapeutic outcomes including disease prevention and wellness. Credit: 3 semester hours.

5414 General Inpatient Care Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. During this advanced pharmacy practice experience (APPE),
the student will continue to develop and demonstrate the necessary skills to provide pharmacist-delivered patient-centered care in a general inpatient care setting. Students are expected to provide this care in collaboration with the patient, their preceptor and healthcare providers. Students will utilize resources of the health care system to maximize therapeutic outcomes and medication use in a diverse inpatient population. Emphasis will be placed on pharmacist-patient-health care provider relationships, promoting the safe use of medications, developing appropriate patient care plans, communication skills and ensuring continuity of care. Credit: 3 semester hours.

5415 Specialty Inpatient Care
Prerequisites: ALL required courses through the Fall of fifth year and successful completion of the competency examination. During this advanced pharmacy practice experience (APPE), the student will continue to develop and demonstrate the necessary skills to provide pharmacist-delivered patient-centered care focusing on a specific inpatient population. Students are expected to provide this care in collaboration with the patient, their preceptor and healthcare providers. Students will utilize resources of the health care system to maximize therapeutic outcomes and medication use in this population. Emphasis will be placed on pharmacist-patient-health care provider relationships, promoting the safe use of medications, developing appropriate patient care plans, communication skills and ensuring continuity of care. Credit: 3 semester hours.

6101 Case Studies in Drugs and Diseases Issues in Pharmaceutical Care
Prerequisites: ALL courses through fifth year. This course is a patient case based interactive learning experience designed to strengthen the student’s ability to provide pharmaceutical care. The cases discussed will cover particular therapeutic dilemmas or challenges and reflect current treatment guidelines. Emphasis will be placed on patient assessment and development of a pharmaceutical care plan. Credit: 3 semester hours.

6102 Prevention and Management of Drug Induced Diseases
Prerequisites: ALL courses through fifth year. A general understanding of adverse drug events including monitoring, evaluating, preventing, and managing these events will provide a basis for organ system specific drug induced disease issues. Drug activity effecting untoward biochemical enzymatic changes related to cellular, organ, and system functions will be explored. Topics to be emphasized will include blood dyscrasias, neurologic, dysfunction, as well as undesirable drug effects on the gastrointestinal, hepatic, renal, dermal, and other systems. Credit: 3 semester hours.

6104 Geriatric Pharmacotherapy
Prerequisites: ALL courses through fifth year. Corequisites: CPP 6101, CPP 6102, CPP 6103, PHR 6101. This course is designed to introduce the student to the physiologic, pharmacologic, and sociologic aspects of aging. The course will focus on: 1) physiological and practical aspects of medication use in the elderly; 2) the pharmacist’s role in geriatric care; and 3) the management of disease states and syndromes that predominately occur in the elderly. The use of a case study format will allow the student to gain experience in designing and monitoring drug regimens for the geriatric patient. Elective. Credit: 3 semester hours.

6105 Contemporary Community Pharmacy Practice
Prerequisites: ALL courses through fifth year. This course will expose the student to contemporary issues in community pharmacy practice. The role of the community pharmacist in the provision of pharmaceutical care will be explored in depth. Particular emphasis will be placed upon the emerging function of the pharmacist as an ambulatory care provider and integral part of the health care team. Elective. Credit: 3 semester hours.

6106 Advanced Concepts in the Management of Allergy and Immunologic Diseases
Prerequisites: ALL courses through the fall of sixth year. This course is intended to facilitate the development of the skills and competencies necessary for the provision of pharmaceutical care to patients suffering from allergic and immunologic disorders. Contemporary issues in the pharmacologic and non-pharmacologic prevention and management of these disorders will be investigated in detail. Emphasis will be placed on patient assessment and the development of appropriate pharmaceutical care plans for both the ambulatory and inpatient settings. Elective. Credit: 3 semester hours.

6107 Pharmacotherapy of Autoimmune Disorders
Prerequisites: ALL courses through fall of fifth year. This course is intended to facilitate the development of the skills and competencies necessary for the provision of pharmaceutical care to patients suffering from autoimmune disorders. The pathophysiology for each disease state will be reviewed along with the pharmacology and therapeutics for the drugs available for their treatment. Emphasis will be placed on patient assessment and the development of pharmaceutical care plans for patients suffering from autoimmune disorders. Elective. Credit: 3 semester hours.

6108 Pediatric Pharmacotherapy
Prerequisites: PHR 4105, PHR 4107. This course is designed to introduce the student to the field of pediatric pharmacotherapy, emphasizing the maturational process involved from the neonatal period into adulthood that influences drug therapy. The units of instruction are developed to prepare future pharmacists in understanding the dosing and use of drugs specific to the pediatric population. Elective. Credit: 3 semester hours.

6109 Competency Management of HIV/AIDS
Prerequisite: PHR 4105. This course is intended to facilitate the development of the skills and competencies necessary for the provision of pharmaceutical care to patients infected with HIV. The course is intended to review the pharmacologic management of HIV infection and associated AIDS indicator conditions. Emphasis will be placed on patient assessment and the development of pharmaceutical care plans for patients suffering from HIV. Elective. Credit: 3 semester hours.

6110 Advanced Topics in Infectious Disease
Prerequisite: PHR 4105 (D and D advanced experiential rotations) This course is designed to build and expand upon the principles of infectious diseases. A compendium of literature, studies, and guidelines in infectious diseases will be examined to obtain and in-depth knowledge of: pharmacodynamics of antimicrobial agents, the treatment of select disease states not covered by Drugs and Infectious Diseases (PHR 4105) and administrative methods to ensure optimal antimicrobial use. Credit: 3 semester hours.

6111 Pharmacotherapy of Psychiatric Disorders
Prerequisites: All professional courses through the fifth year. Students taking this course will learn advanced principles in the therapeutic management of psychiatric disorders. This course is designed to expand on the principles learned in the Drugs and Diseases course. The student will learn about special topics in the treatment of schizophrenia, major depressive disorder, bipolar disorder and anxiety disorders. Treatment guidelines as well as other factors influencing pharmacotherapy will be discussed. The didactic component of the course will be supplemented with active learning activities including case studies and student presentations. Lecture, 3 hours. Credit: 3 semester hours.

6112 Advanced Therapeutic Management of Oncology Patients
Prerequisites: All courses through the fifth year. This is an advanced-level course focusing on the therapeutic management of cancer patients. A competency list of oncology-related topics will be covered with a goal to develop advanced clinical skills and competencies necessary for pharmacists to provide care to cancer patients. This course is designed to improve independent and active learning abilities enabling students to advance their knowledge, understanding and skills in managing the complex clinical issues facing cancer patients. Credit: 3 semester hours.
6113 Advanced Education in Patients with Diabetes
Prerequisites: All courses through the 5th year of study.
This course is designed to provide students the opportunity to learn in-depth knowledge of diabetes through didactic and hands-on learning. A competency list of diabetes-related topics will be covered with a goal to develop advanced clinical skills and competencies necessary for pharmacists to provide advanced care and education to patients with diabetes. A service-learning component will be incorporated into the course. Credit: 3 semester hours.

Pharmaceutical Sciences Course Offerings (PHS)
Louis D. Trombetta, Ph.D., Chair

Objectives
The Department of Pharmaceutical Sciences is committed to providing a solid background in the biomedical sciences to allow students in pharmacy and allied health programs to acquire critical learning skills and to develop successful careers rendering health service to the public in industrial, academic and clinical settings. The department provides students with the fundamental knowledge base that enables them to interpret and remain current with the scientific literature in clinical and basic research. Students are prepared to explain the action of drugs in current use and to understand the manner in which these drugs are employed in clinical and basic science settings. Students are expected to acquire the necessary critical skills and background in chemistry, physiology, toxicology and pharmacology that are essential to understanding the nature, composition, standardization and evaluation of natural and synthetic substances used in the diagnosis, prevention and treatment of disease.

The following are PHS courses:

2101 Public Health
Prerequisite: BIO 2000. All aspects of public health including organizations, administration, environmental social health problems will be discussed. The study of epidemiology and disease control will be emphasized. Credit: 3 semester hours.

2201 Biopharmaceutical Chemistry/Biotechnology
Prerequisites: CHE 1110, 1111, 1112; CHE 1120, 1121, 1122; CHE 1130, 1131, 1132; BIO 2000. Corequisites: PHS 2301. The course is an intermediate level undergraduate biochemistry and molecular biology lecture course. The Chemistry of macromolecules, i.e. proteins, lipids assemblies, nucleic acids, and polysaccharides, enzymology, an introduction to metabolic pathways to energy utilization in cells is the bulk of the material. In addition, the fundamental biochemical notions of nucleic acid metabolism, including DNA replication and repair mechanisms, RNA, and protein synthesis is covered. Vitamins and trace metals are discussed from the standpoint of their role in enzymatic reactions and metabolic sequences, and where possible related to health consequences. Lecture. Credit: 4 semester hours.

2301 Biomedical Laboratory I
Prerequisites: CHE 1110, 1111, 1112; CHE 1120, 1121, 1122; CHE 1130, 1131, 1132; BIO 2000. Corequisites: PHS 2201. Demonstration and experimentation of basic principles of pharmaceutical biochemistry and biotechnology. Laboratory: 3 hours. Credit: 1 semester hour.

3101 Introduction to Pathology (for allied health and toxicology students)
Prerequisite: PHS 3103. A detailed discussion of the relationships between the normal and pathologic anatomy of the human body and disease mechanisms occurring in the major organ groups. Lecture, 3 hours. Credit: 3 semester hours.

3103 Human Anatomy and Physiology I (for allied health and toxicology students)
Corequisite: PHS 3104. Detailed study of the mechanisms whereby the human body maintains homeostasis in the major functional systems of the body to provide a foundation for the study of pharmacology. Lecture, 3 hours. Credit: 3 semester hours.

3104 Human Anatomy and Physiology Laboratory I (for allied health and toxicology students)
Corequisite: PHS 3103. Demonstration and study of major functional systems of the body. Laboratory, 3 hours. Laboratory fee $120. Credit: 1 semester hour.

3105 Human Anatomy and Physiology II (for allied health and toxicology students)
Prerequisite: PHS 3103, 3104. A study of the structure and function of the major body systems: nervous, endocrine, urinary, body fluids and electrolytes, reproductive system. Lecture, 3 hours. Credit: 3 semester hours.

3151 Calculations in Pharmacy Practice
Corequisites: PHS 3101, 3102. This course deals with pharmaceutical calculations involved in preparation, dispensing, and delivery of pharmaceutical products. Lecture, 2 hours. Credit: 2 semester hours.

3152 Introduction to Product Development
Corequisites: PHS 3101, 3102. This course deals with considerations involved in product development and formulation of a dosage form. Lecture, 2 hours. Credit: 2 semester hours.

3302 Biomedical Laboratory II (for pharmacy students)
Prerequisite: PHS 2301; PHS 3504. Corequisites: PHS 3504; PHS 3506; PHS 3507. Demonstration and experimentation of basic principles of human anatomy and physiology, microbiology, immunology, and biotechnology. Laboratory: 3 hours. Credit: 1 semester hour.

3303 Biomedical Laboratory III (for pharmacy students)
Prerequisites: PHS 2301; PHS 3302. Corequisites: PHS 3508; PHS 3509. Demonstration and experimentation of basic principles of medicinal chemistry, pharmacology, toxicology, and biotechnology. Laboratory: 3 hours. Credit: 1 semester hour.

3504 Human Anatomy and Physiology I (for pharmacy students)
Prerequisites: BIO 2000, PHS 2201. A study of embryology and normal and the functional aspects of the body systems: molecular aspects of cell biology, cell physiology, cell structure and organization, tissues, integumentary, musculoskeletal, cardiovascular, lymphatic, respiratory, and digestive systems. Credit: 3 semester hours.

3505 Clinical Immunology
Prerequisites: BIO 2000; PHS 2201; PHS 2101. A study of the immune system, immune response, and immunity in humans. Principles of antibody-antigen relationship will be discussed. Special emphasis will be placed on molecular biology of the immune response, genes controlling antibody synthesis, its development, function, and immunopathology will be discussed. Methods of detection of immunogenic molecules and immunotherapy will also be discussed. Credit: 2 semester hours.

3506 Introduction to Infectious Diseases
Prerequisites: BIO 2000; PHS 2201; PHS 2101. A study of the general microbial concepts, principles of infectious disease, and host-parasite relationships. Special emphasis will be placed on pathogenic microorganisms of man, inflammatory responses to infectious agents and clinical aspects of infections. Credit: 2 credit hours.

3507 Human Anatomy and Physiology II (for pharmacy students)
Prerequisites: PHS 2201; PHS 2301; PHS 3504. Corequisite: PHS 3302. A study of the structure and function of the major body systems: nervous, endocrine, urinary, body fluids and electrolytes, reproductive system. Credit: 3 semester hours.

3508 Introduction to Medicinal Chemistry
Prerequisites: PHS 2201; PHS 2301; PHS 3302. Corequisites: PHS 3303. This course will introduce the student to the specific principles, which are fundamental to medicinal chemistry and foundation to the integration of this basic pharmaceutical science into therapeutics. Specifically, the course will introduce the student to the various drug categories with particular emphasis on chemical nomenclature,
physicochemical properties and chemical aspects of the dynamics of drug action. 
Credit: 2 semester hours.

3509 Introduction to Pharmacology
Prerequisites: PHS 2201; PHS 3504; PHS 3507; PHS 2301; PHS 3302. Corequisites: PHS 3303. This course will introduce the student to the scientific principles, which are fundamental to pharmacology and foundational to the integration of this basic pharmaceutical science into therapeutics. Specifically the course will introduce the student to the various drug categories and their mechanism of action including receptor interactions and the dynamics of drug action. 
Credit: 2 semester hours.

3510 General Pathology and Clinical Laboratory Data
Prerequisites: PHS 2101; PHS 3504; PHS 3505; PHS 3506; PHS 3507; PHS 3302. Corequisites: PHS 3303. A detailed study of the basic principles involving the mechanisms of disease are discussed. Special emphasis will be placed on degeneration, inflammation and repair, disturbances in hemodynamics, developmental defects and neoplasia. Clinical correlates will be covered with respect to laboratory data. 
Credit: 3 semester hours.

3601 Pharmaceutics I
Prerequisites: MTH 1250; MTH 1260; CHE 1110, 1111, 1112, CHE 1120, 1121, 1122, CHE 1130, 1131, 1132; BIO 2000. Corequisite: PHS 3602. Pharmaceutics is the applied science and technology of pharmacy and is based upon the physical, chemical, and biological principles used in the preparation, preservation, and utilization of drug products and/or pharmaceutical dosage forms. The first semester concentrates on the specific physical, chemical, and biological principles that govern heterogeneous fluid, semi-solid, and solid systems. The course integrates fundamentals and theory with the pharmaceutical dosage forms to which they best apply. Students are also introduced to the concepts of degradation of pharmaceutical products, pathways of degradation, factors affecting drug stability, approaches to maximize stability of a product. 
Credit: 4 semester hours.

3602 Pharmacy Practice Laboratory I
Corequisite: PHS 3601; PHS 3602. Corequisite: PHS 3603; PHS 3604. Pharmaceutics is the applied science and technology of pharmacy and is based upon the physical, chemical, and biological principles used in the preparation, preservation, and utilization of drug products and/or pharmaceutical dosage forms. The second semester concentrates on the specific physical, chemical, and biological principles that govern heterogeneous fluid, semi-solid, and solid systems. The course integrates fundamentals and theory with the pharmaceutical dosage forms to which they best apply. Students are also introduced to the concepts of degradation of pharmaceutical products, pathways of degradation, factors affecting drug stability, approaches to maximize stability of a product. 
Credit: 4 semester hours.

3604 Pharmacy Practice Laboratory II
Prerequisites: PHS 3601; PHS 3602. Corequisite: PHS 3603. This laboratory enables the student to correlate the principles and theory with experimental observation of heterogeneous systems. Upon completion of the laboratory course, the student should be able to apply the important physicochemical principles of pharmaceutical science and technology and to use the apparatus and techniques in the preparation of stable heterogeneous dosage forms. 
Laboratory: 3 hours. Credit: 1 semester hour.

3951: 3952 Research in Pharmaceutical Sciences I; II
An elective course designed to familiarize the student with opportunities for research (conducting an actual research project under the guidance of a faculty member in the student’s chosen area). Laboratory fee, $120. 
Credit: 3 semester hours.

4204 Introduction to Clinical Chemistry
The study of clinical laboratory tests based on chemical principles or procedures and their use in the diagnosis, prognosis, and treatment of diseases. Information is provided on routine test specimens, the analytical principles underlying common laboratory tests and home test kits, and the correlation of laboratory results with patient’s health status. Attention is also given to the effects of physiological, dietary and drug-related factors on laboratory values. 
Credit: 3 semester hours.

4601 Extemporaneous Compounding
Prerequisites: PHS 3603; PHS 3604; Corequisite: PHS 3602. Extemporaneous compounding is the preparation of a medication for an individual patient following receipt of a legal order (prescription) from a prescriber. The course is structured to provide the students training and expertise to ascertain the quality, safety, and technique required to compound and dispense the prescription in community and institutional pharmacy practice. 
Credit: 3 semester hours.

4602 Biopharmaceutics and Basic Pharmacokinetics
Prerequisites: PHS 3603; PHS 3604. Biopharmaceutics is the study of the factors influencing bioavailability of a drug in man and animals and the use of this information to optimize therapeutic activity of drug products in clinical application. This course includes the study of (a) factors which may influence availability and disposition as well as pharmacological and toxicological response of drugs, and (b) pharmacokinetic mathematical models to assess drug absorption, distribution, metabolism and elimination process, including continuous and intermittent drug infusion. 
Credit: 3 semester hours.

6204 Advanced Pharmacy Calculations
Prerequisites: Completion of all fifth-year courses. This course deals with pharmaceutical calculations involved in contemporary pharmacy practice. Special emphasis is placed on improving the skills of pharmacy students and stimulating their thinking in the application of mathematical concepts in contemporary pharmacy practice, e.g., extemporaneous compounding, preparing intravenous admixtures, electrolyte balance, radiopharmaceuticals, calculation of dosage regimen during multiple dosing and calculation of dosage regimen. 
Lecture, 3 hours. Credit: 3 semester hours.

6207 Contemporary Parenteral Practice
Prerequisites: PHS 4303; PHR 5201, and all courses taught through fifth year. This course is designed to enhance understanding of the techniques encountered in the practice involving parenteral dosage forms. The state of the art in special equipment, components, and devices necessary to prepare these delivery systems will be studied in detail. This course will provide additional exposure to mathematics as well as the influence of physical and chemical properties of drugs and how they relate to excipient, delivery devices and preparation mechanism. This course will cover topics such as intravenous admixtures (IV Ads), total parenteral nutrition (TPN), irrigation, ophthalmic and other parenteral products, their content, dosing, stability and compatibility. 
Lecture, 3 hours. Credit: 3 semester hours.

6209 Drug Delivery and Targeting
Prerequisites: PHS 4304 and all required fifth-year courses. This course is designed to review controlled release technology primarily as it relates to medicinal applications. Students will learn about the design, fabrication, methods of controlling release, and theoretical considerations of various classes of drug delivery systems (matrixes, membrane controlled reservoir systems, and bioerodible systems) as well as the application of these systems for various routes of delivery (parenteral, oral, transdermal, nasal, pulmonary, etc.). 
Lecture, 3 hours. Credit: 3 semester hours.
6210 Special Drug Delivery Systems
Prerequisites: Completion of all fifth-year courses. This course will cover modified release drug delivery systems administered by transdermal, intranasal, ocular and parenteral routes. The major emphasis will be placed on the mechanisms of drug absorption through various routes, pharmacokinetic considerations, physico-chemical characteristics of drugs, and principles involved in the design, development and manufacture of these delivery systems. Specific formulation excipients employed in these delivery systems and physicochemical characteristics desirable from these aids will be discussed. In addition, evaluation of these drug delivery systems, especially in vitro and in vivo evaluation, and their correlation will also be covered. Lecture, 3 hours. Credit: 3 semester hours.

6211 Contemporary Product Development
Prerequisites: PHS 4303, and all required courses through the fifth year. This course deals with the processes involved in development and formulation of pharmaceutical products from their inception to the marketing of dosage forms. Special emphasis is placed on the technology involved in their preparation, bioavailability considerations, and in vitro:in vivo correlation. Lecture, 3 hours. Credit: 3 semester hours.

6212 Delivery of Biotechnology-Derived Drugs
Prerequisites: Completion of all required fifth-year courses. This course will cover delivery systems for biotechnology-derived drugs and techniques used to evaluate these delivery systems. The major emphasis will be placed on important aspects utilized in the design and development of delivery systems for biotechnology-derived drug substances, such as peptides and proteins. Novel approaches to deliver gene therapy will also be discussed. In addition, studies such as in vitro drug release studies, cell culture studies used to determine drug absorption, and in vivo pharmacokinetic studies for the evaluation of biotechnology derived products will be covered. Lecture, 3 hours. Credit: 3 semester hours.

Toxicology (TOX)
The following courses are TOX courses:

1401 Toxicogenomics
This course reviews the principles of cell biology in terms of the underlying molecular mechanisms that drive cellular function. The central dogma and functional concepts of molecular pharmaceutical science is reviewed and tied into the larger context of gene, genome function. Upon completion of the course, students will possess a working framework of molecular pharmaceutical sciences, genomic scale analysis and toxicogenomics. Students will be prepared to integrate new molecular technologies and paradigms as they emerge. The course stresses the use of a range of resources available to health professionals. Lecture, 3 hours. Credit: 3 semester hours.

1402L Toxicogenomics Lab
Corequisite: PHS 1401. Students are exposed to new emerging molecular technologies and paradigms in a series of hands-on bench work and computational exercises. This series support the students already developing framework of molecular biology and genomic scale analysis from the accompanying didactic course. In this lab, students are given a set of modular online labs to introduce, reinforce, and expand upon the concepts covered in the Toxicogenomics course. Online modules use existing academic and federal research institute resources wrapped into a modular format to introduce the students to information outlets for health professionals. The lab exercises teach and reinforce the concepts of evaluating whole systems, i.e., expression data sets, multiple allele analysis, etc. Laboratory, 3 hours. Credit: 1 semester hour. Lab fee $120.

2403 Current Issues in Toxicology
Toxicology is the science concerned with understanding the nature of toxic chemicals and how they interact with living organisms. Public issues and controversies where toxic chemicals are involved are studied with respect to the social, political and scientific values that impinge on their resolution. Lecture, 3 hours. Credit: 3 semester hours.

3405; 3406 Principles of Toxicology I; II
(formerly 2401, 2402)
An introduction to toxicology with emphasis on material involved as well as systems affected. A discussion of the classifications of poisons and the preventive aspects. Lecture, 4 hours. Credit: 4 semester hours.

4403 Toxicology Colloquium
(formerly PHS 3403)
The student is prepared for the process of identifying a research question of toxicological interest, research design and the handling of research data. Lecture, 4 hours. Credit: 4 semester hours.

4404 Pharmacologic Toxicology
Prerequisites: PHS 3509, 3405, 2201. Agents affecting the autonomic, central nervous, cardiovascular, renal and endocrine systems, as well as antineurological agents are examined therapeutically and toxicologically. Lecture, 4 hours. Credit: 4 semester hours.

4405 Pharmacologic Toxicology Laboratory
Prerequisite: PHS 3509. This laboratory will provide the student with opportunity to experience the effects of drugs and other toxic substances on living systems, in coordination with the course on Pharmacologic Toxicology. Laboratory, 3 hours. Credit: 1 semester hour. Laboratory fee $120.

4412 Regulatory Toxicology and Risk Analysis
Prerequisites: TOX 4404. Advance concepts of safety evaluation and monitoring for human and environmental responses to chemicals. Methods of evaluation of toxic hazards will be considered for pharmaceuticals, industrial chemicals, food contaminants, and environmental chemicals. Students acquire an appreciation for the role of uncertainty and quality of data in hazard assessment through experiential involvement in a formal risk analysis of a hypothetical toxic incident. Lecture, 4 hours. Credit: 4 semester hours.

4413 Analytical and Quantitative Toxicology
Prerequisites: CHE 2240. Corequisites: TOX 4414 and TOX 4405. This course introduces students to principles of analysis for drugs and environmental contaminants as well as methods used in toxicological research. Topics will include sample preparation, analyte extraction, and detection. Techniques and instrumentation covered will include spectrophotometry, chromatography (TLC, GC, HPLC), mass spectrometry, immunoassay methods (EMIT, ELISA), and molecular biology. Lectures will emphasize theoretical and practical aspects of analysis and instrumentation. Credit: 3 semester hours.

5301 Toxicology and Drugs of Abuse
Prerequisites: All required courses in the first four years. Students are instructed in the principles of toxicology with an emphasis placed on clinical toxicology and the management of the drug overdose victim and the adverse effects caused by drugs of abuse. Lecture, 2 hours. Credit: 2 semester hours.
Pharmacy Administration and Health Sciences Course Offerings (PAH)

Wenchen Wu, R. Ph., M.B.A., Ph.D., Chair

Objectives

The department seeks to provide students with the opportunity to acquire the knowledge, develop the attitudes and master the skills required for contemporary pharmacy practice.

Lectures, utilization of the multi-media programs in the Resource Center and individual and group conferences with faculty give the student a knowledge of the principles and processes in the manufacture, stabilization, preservation, storage and dispensing of both official and non-official dosage forms.

Classroom and conference discussions give the student an opportunity to develop creative talents in compounding and formulating dosage forms.

Health Sciences Course Offerings (ALH)

Objectives

To provide a strong foundation in the basic allied health and the necessary tools to work in selected health sciences.

The following courses are ALH courses:

1201 Introduction to Health Care

Problems in the development of competency health services in the United States; characteristics of a profession; development of modern medical practice; medical terminology; consideration of the many health professions that form the health team. Lecture, 2 hours. Credit: 2 semester hours.

2101 Introduction Clinical Laboratory Sciences

Historical development of the clinical laboratory sciences profession. Introduction to the types of tests performed in a clinical laboratory. Lecture, 2 hours. Credit: 2 semester hours.

3201 Professional and Behavioral Medicine

Prerequisite: All prerequisite courses to the junior and senior years of the PA program. This course is designed to introduce the PA student to various diagnostic imaging studies, clinical chemistry theory and laboratory assessment. Emphasis is placed on indications for diagnostic testing, characteristics of specific procedures, interpretation of laboratory or imaging results and the techniques, advantages, disadvantages, benefits and risks of various procedures. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on case-based clinical assessment, association of abnormal laboratory and imaging results with specific diseases, and the correlation of enzymes to body systems and organ dysfunction. Lecture, Credit: 2 semester hours.

3202 Medical Assessment

Prerequisite: All prerequisite courses to the junior and senior years of the PA program. This course is designed to introduce the PA student to various diagnostic imaging studies, clinical chemistry theory and laboratory assessment. Emphasis is placed on indications for diagnostic testing, characteristics of specific procedures, interpretation of laboratory or imaging results and the techniques, advantages, disadvantages, benefits and risks of various procedures. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on case-based clinical assessment, association of abnormal laboratory and imaging results with specific diseases, and the correlation of enzymes to body systems and organ dysfunction. Lecture, Credit: 1 semester hour.

3203 Clinical Medicine 1

Prerequisite: All prerequisite courses to the junior and senior years of the PA program. This course is designed to instruct the PA student in the areas of human health and disease in immunology, dermatology, ophthalmology, otolaryngology and pulmonology. Teaching emphasis will be a sequential method of instruction relevant to the epidemiology, etiology, pathophysiology, clinical manifestations, diagnosis, treatment, clinical pharmacological applications, complications and prognoses of selected disease states. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on case-based clinical therapeutics and patient education regarding drug administration, potential adverse effects and drug interactions. Lecture, Credit: 4 semester hours.

3204 Clinical Medicine 2

Prerequisite: All prerequisite courses to the junior and senior years of the PA program. This course is designed to instruct the PA student in the areas of human health and disease in cardiology, gastroenterology, endocrinology, hematology, oncology, nephrology and urology. Teaching emphasis will be a sequential method of instruction relevant to the epidemiology, etiology, pathophysiology, clinical manifestations, diagnosis, treatment, clinical pharmacological applications, complications and prognoses of selected disease states. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on case-based clinical therapeutics and patient education regarding drug administration, potential adverse effects and drug interactions. Lecture, Credit: 4 semester hours.

3205 Competency Health History and Physical Diagnosis

This course is designed to develop the cognitive, psychomotor and affective attributes in the PA student for identifying and describing normal human anatomy, recognizing normal vs. pathological clinical manifestations, obtaining a medical history, performing a screening physical examination and recording findings as medical-legal documents. Teaching emphasis will be a sequential method of instruction relevant to the structure and function of body systems, common pathophysiology and clinical manifestations and physical examination demonstration. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on communication skills, cultural competency, professionalism and standardization of medical record documentation. Students will demonstrate acquisition of skills during supervised hospital visits and practical examinations, and will begin to incorporate assessment and management plans into patient care. Lecture, 4 hours. Credit: 4 semester hours.

3206 Clinical Medicine 3

Prerequisite: All prerequisite courses and fall courses in the junior and senior years of the PA program. This course is designed to instruct the PA student in the areas of human health and disease in neurology, cardiology, infectious disease, obstetrics and gynecology. Teaching emphasis will be a sequential method of instruction relevant to the epidemiology, etiology, pathophysiology, clinical manifestations, diagnosis, treatment, clinical pharmacological applications, complications and prognoses of selected disease states. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on electrocardiogram interpretation, case-based clinical therapeutics and patient education regarding drug administration, potential adverse effects and drug interactions. Lecture, Credit: 4 semester hours.

3207 Clinical Medicine 4

Prerequisite: All prerequisite courses and fall courses in the junior and senior years of the PA program. This course is designed to instruct the PA student in the areas of human health and disease in rheumatology, orthopedics, psychiatry and community medicine. Teaching emphasis will be a sequential method of instruction relevant to the epidemiology, etiology, pathophysiology, clinical manifestations, diagnosis, treatment, clinical pharmacological applications, complications and prognoses of selected disease states. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Emphasis is placed on special procedures in diagnostic imaging, as well as promotion, prevention,
maintenance, and protection of health and wellness of individuals and communities to include social and economic determinants of health and common medical problems that are frequently encountered in urban settings. Teaching will also utilize case-based clinical therapeutics and patient education regarding drug administration, potential adverse effects and drug interactions. Lecture, Credit: 4 semester hours.

3208 Case-Enhanced Focused Health History and Physical Diagnosis
Prerequisite: All prerequisite courses and fall courses in the junior and senior years of the PA program. This course is designed to introduce students to the concepts of surgical diagnosis and treatment, building on the student’s integrated foundation of medical, laboratory medicine, diagnostic imaging and pharmacological applications. The student will learn to recognize diseases that require surgical intervention, formulate surgical diagnoses and identify relevant surgical treatments. Emphasis will be placed on the role of the Physician Assistant in the pre-operative, operative and post-operative management of surgical patients. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Students will demonstrate acquisition of skills during supervised hospital visits and practical examinations. Lecture, Credit: 1 semester hour.

3209 Emergency Medicine
Prerequisite: All prerequisite courses and fall courses in the junior and senior years of the PA program. This course is designed to instruct the PA student in the emergency department approach to medical care, including triage techniques, prioritization and consultation relevant to a variety of patient conditions. The student will incorporate knowledge of the epidemiology, etiology, pathophysiology, clinical manifestations, diagnostics and management of disease states to treat focused emergency problems. Emphasis will be placed on recognizing and treating conditions that are potentially life-threatening requiring urgent or emergent intervention inclusive of emergency techniques. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Lecture, Credit: 2 seminar hours.

3210 Geriatric and Pediatric Medicine
Prerequisite: All prerequisite courses and fall courses in the junior and senior years of the PA program. This course is designed to introduce the PA student to the variable structures and functions of organ systems throughout the human lifespan, and medical and behavioral problems unique to pediatric and geriatric populations. Emphasis is placed on the behavioral and infectious conditions encountered in pediatric and geriatric clinical practice, and on patient, parental and caregiver education in regards to vaccinations, health care maintenance, safety and anticipatory guidance, long-term care facilities and home care. Specifically, it will provide an overview of the epidemiology, etiology, pathophysiology, clinical manifestations, diagnosis, treatment, complications and prognoses of selected pediatric and geriatric conditions. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. Lecture, Credit: 2 semester hours.

3211 General Surgery
Prerequisite: All prerequisite courses and fall courses in the junior and senior years of the PA program. This course is designed to introduce students to the concepts of surgical diagnosis and treatment, building on the student’s integrated foundation of medical, laboratory medicine, diagnostic imaging and pharmacological applications. The student will learn to recognize diseases that require surgical intervention, formulate surgical diagnoses and identify relevant surgical treatments. Emphasis will be placed on the role of the Physician Assistant in the pre-operative, operative and post-operative management of surgical patients. This course will incorporate interdisciplinary instruction utilizing faculty from varied areas of expertise and experience. The student will also become competent in performing various medical-surgical procedures. Lecture, Credit: 2 semester hours.

4201 Emergency Medicine
Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in a hospital or urgent care ambulatory setting. The student will be introduced to the triage system to learn and develop the skills necessary to perform the primary survey and stabilization of patients in the acute setting. The student will perform focused history and physical exams, generate differential diagnoses and develop therapeutic treatment plans for adult and pediatric patients with urgent or emergent conditions, as well as provide ambulatory or “fast-track” care. This includes diagnostic testing, medications and non-pharmacological treatment interventions. The student will also demonstrate and perform practical medical-surgical procedures including CPR and BCLS skills. The student will recognize the need for consultation and referral in provision of cost-effective orthopedic care, including acute and chronic disease management, health promotion and safety, disease prevention and routine healthcare maintenance. The student will provide patient education with an emphasis on cast immobilization techniques, safety and health literacy issues. Rotation, 200 hours. Credit: 3 semester hours.

4204 Clinical Pediatrics Rotation
Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in a hospital or office-based pediatric setting. The student will perform competency history and physical exams, generate differential diagnoses and develop therapeutic treatment plans for pediatric patients with acute and chronic disease problems and well child visits and school/camp exams. This will include diagnostic testing, medications and non-pharmacological treatment interventions. The student will recognize the need for consultation and referral in provision of cost-effective infant, pediatric, and adolescent medical care, including acute and chronic disease management, health promotion, disease prevention and routine healthcare
maintenance. The student will provide patient education with an emphasis on growth and development and health literacy issues.

**Rotation, 200 hours. Credit: 3 semester hours.**

**4205 Clinical Primary Care 1 Rotation**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in an ambulatory or outpatient hospital or office-based primary care medical setting. The student will perform competency history and physical exams, generate differential diagnoses and develop therapeutic treatment plans for patients with acute and chronic medical problems, including diagnostic tests, medications and non-pharmacological treatment interventions. The student will recognize the need for consultation and referral, transfer to an emergency or acute care setting in provision of cost-effective medical care, including acute and chronic disease management, health promotion, and patient education. The student will provide patient education, disease prevention and routine healthcare maintenance across all age groups with an emphasis on health literacy issues.*

**Rotation, 200 hours. Credit: 3 semester hours.**

**4206 Elective Clinical Rotation**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in a specialty of the student’s choice that may take place in a hospital or office-based setting. Elective rotations include but are not limited to the following: cardiology, gastroenterology, infectious disease, psychiatry, pulmonology, heme-oncology, critical care, dermatology, occupational medicine, gay and lesbian health, and the physically and mentally challenged. The student will perform competency or focused history and physical exams, generate differential diagnoses and develop treatment plans for patients with acute and chronic problems. This will include diagnostic tests, medications and non-pharmacological treatment interventions. The student will become familiar with the need and role of consultation and referral of patients, transfer to an emergency or acute care setting in the clinical setting through provision of cost-effective care, including acute and chronic disease management, health promotion, disease prevention and routine healthcare maintenance. The student will provide patient education with an emphasis on health literacy issues across all age groups as applicable to clinical site. Rotation, 200 hours. Credit: 3 semester hours.**

**4207 Clinical Surgical Rotation**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in a hospital inpatient setting, which may include outpatient or office-based clinical duties. Student responsibilities include: performance of history and physical exams, formulation of differential diagnoses, therapeutic treatment plans across all age groups for patients with surgical problems, including pre-operative, intra-operative, and post-operative care. The clinical experience will also include ordering of diagnostic tests, medications and non-pharmacological treatment interventions and performance of diagnostic laboratory tests, and participation in surgical procedures (operating room). Rotation, 200 hours/call required. Credit: 3 semester hours.**

**4208 Clinical Geriatrics/Long Term Care Rotation**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in a hospital or office-based geriatric setting. The student will perform competency and focused history and physical exams, generate differential diagnoses and develop therapeutic treatment plans for adult and geriatric patients with medical or surgical conditions. This includes diagnostic tests, medications and non-pharmacological treatment interventions, while under the supervision of the preceptor. The student will recognize the need for consultation and referral, in provision of cost-effective geriatric care, including acute and chronic disease management, health promotion, health maintenance and disease prevention. The student will provide patient education with an emphasis on health literacy issues.*

**Rotation, 200 hours. Credit: 3 semester hours.**

**4209 Clinical Primary Care 2 Rotation**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation that continues the educational and experiential learning of the Primary Care 1 course in an ambulatory or outpatient hospital or office-based primary care medical setting for an additional five-week rotation. The student will perform competency history and physical exams, generate differential diagnoses and develop therapeutic treatment plans for patients with acute and chronic medical problems. This will include diagnostic tests, medications and non-pharmacological treatment interventions. The student will recognize the need for consultation and referral, transfer to an emergency or acute care setting in provision of cost-effective medical care, including acute and chronic disease management, health promotion, disease prevention and routine healthcare maintenance. The student will provide patient education, disease prevention and routine healthcare maintenance across all age groups with an emphasis on health literacy issues.*

**Rotation, 200 hours. Credit: 3 semester hours.**

**4210 Clinical Internal Medicine Rotation**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This course is a five-week rotation in a hospital or office-based internal medicine setting. The student will perform competency history and physical exams, generate differential diagnoses and develop therapeutic treatment plans for patients with acute and chronic medical problems. The clinical experience will include diagnostic testing, medications and non-pharmacological treatment interventions including patient education with an emphasis on health literacy issues across all age groups. The student will learn to recognize the need for consultation and referral in provision of cost-effective adult medical care, including acute and chronic disease management, health promotion, disease prevention and routine healthcare maintenance. Rotation, 200 hours. Credit: 3 semester hours.**

**4211 Senior Competencies Component**

*Prerequisites: All required didactic year classes and successful completion of competency examinations. This is a course is designed to supplement the clinical experience of the Physician Assistant student with appropriate learning sessions on callback days. While on clinical rotations, students will be performing competency or focused history and physical examinations, generating differential diagnoses, ordering and interpreting laboratory and imaging studies and developing treatment plans for patients with acute and chronic problems under the supervision of the preceptor. Emphasis is placed on cost-effective care, disease management and health promotion, disease prevention and routine healthcare maintenance. The student will gain and apply knowledge regarding epidemiology, risk factors, etiology, pathophysiology, clinical manifestations and the clinical assessment of medical and surgical diseases. Learning sessions on call back days are designed to augment student’s knowledge and further develop and perfect their history taking, physical examination and procedural skills. Lecture. Credit: 0.**

**4140 Transition to the Clinical Laboratory (CLS)**

*This course will introduce the student to the standards, functions, and procedures of clinical laboratory practice. The course will include the history of medical technology at this university, a history of the profession, HIPAA and safety regulations, spectrophotometry, quality control (including standards, controls, etc), universal precautions, the professional code of ethics, phlebotomy and an introduction to hematology, microbiology, mycology, urinalysis, and immunohematology. Lecture, 2 hours. Credit: 2 semester hours.**

**4151 Clinical Bacteriology I (CLS)**

*The various classes of antibiotics are introduced to the student. Different types of susceptibility testing using manual and automated methodologies are presented. Discussion of bacteria implicated in human infections is begun. Gram positive organisms such as Staphylococcus, Streptococcus, Corynebacterium and Bacillus are discussed.*
both in diseases caused and identification methods used in the clinical microbiology laboratory. Discussion of Gram negative bacteria such as Haemophilus and Neisseria are also included. Discussion of the biochemical tests involved in the identification of the Enterobacteriaceae is begun. The application of these tests a means to identify these organisms is presented. The diseases caused by these organisms is also included and discussed. Lecture, 3 hours. Credit: 3 semester hours.

4152 Clinical Immunology I (CLS)
This course is composed of the study of cellular and antigen-antibody reaction. Also covered are the types of immunity and factors associated with immunologic disease. Antibody synthesis and function are introduced. Functions of the various cellular components are also discussed including T and B lymphocytes and plasma cells. Discussion will also include a description of various other types of nonspecific mediators of the immune system. An overview of molecular diagnostics is presented (each course covers its own molecular diagnostics theory) and the latest laboratory testing methods are presented to the student. Lecture, 1 hour. Credit: 1 semester hour.

4153 Clinical Immunohematology I (CLS)
This course will begin with a review of the immunology as applied to Immunohematology such as antigens, immunoglobulins and blood antibodies. Also discussed are ABO and Rh typing and antiglobulin testing. Other major blood group antigens (Kell, Lewis, etc.) and rare blood groups (Colton, Diego, etc.) are introduced. Other topics include compatibility testing, crossmatching and antibody identification. Laboratory methodologies used in Immunohematology are also covered. Lecture, 2 hours. Credit: 2 semester hours.

4154 Clinical Hematology I (CLS)
This course is designed to present the students with the theory of blood and bone marrow formation and diseases related to these cells. The erythrocytic and leukocytic cell series are explored in relation to their development, maturation, function and identification. Through the use of audiovisuals and microscope work, identification of each cell type is discussed and abnormal cells reviewed as to composition and related diseases. The course covers iron metabolism, absorption, transport, and storage. The synthesis of hemoglobin for both normal and abnormal varieties as well as electrophoresis and other identifying methodologies are explained and the various instruments used in the study of hematology are taught. Students are exposed to all the various procedures the laboratories perform including the maintenance and troubleshooting of instrumentation. The mechanisms of hemostasis including blood vessels, platelets, and fibrinolysis are discussed. The structure of blood vessels and their relationship to hemostasis is covered. Platelet formation, maturation and function will be discussed as well as qualitative and quantitative disorders. The course will include factors involved in the coagulation cascade and include tests used in the laboratory to diagnose disorders of hemostasis. The students will perform these procedures in the hospital laboratory. Lecture, 3 hours. Credit: 3 semester hour.

4155 Application, Analysis and Lab Practice in Clinical Chemistry I (CLS)
The course is designed to introduce the students to clinical chemistry theory and laboratory practice. It is the study of serum and other body fluids by biochemical analysis using the latest instrumentation for the test procedures. The course discusses laboratory calculations, principles of photometry, nephelometry, chemiluminescence, fluorometry and “tagged assays,” electrolytes, trace elements and mineral metabolism. Principles of EIA, instrumentation concepts and discussion commonly used analyzers in the clinical lab are also presented. Classification of enzymes in relation to body organs, clinical significance of the test used and factors affecting the testing will be covered. Structure and function of lipids and lipoproteins, methods used to analyze these products will be examined. Cholesterol utilization and formation including HDL and LDL and triglycerides will be covered along with laboratory analysis. This course requires the students to perform all analysis on the instruments and analysis listed above. Lecture, 4 hours. Credit: 4 semester hours.

4156 Urinalysis and Body Fluids I (CLS)
This course will address the structure and function of the kidney in its role in the formulation of urine. Routine urinalysis tests will be discussed for each analyte found in the urine specimen utilizing both manual and automated testing procedures. Metabolic disorders requiring special tests will also be covered. Kodachrome slides and CD Rom will be used for the microscopic analysis of casts, cells, crystals and other miscellaneous particles seen in sediment. Lecture, 2 hours. Credit: 2 semester hours.

4157 Mycology and Parasitology I (CLS)
The course will introduce the student to the classification of those parasites that infect man. Preparation and examination of specimens will be discussed. Lectures will cover important parasites including the hemoflagellates such as Leishmania and Trypanosoma, nematodes infecting the intestine, liver lung, and blood and cestodes. The student will also be introduced to the glossary of terms used in the examination of specimens for fungal agents. Specimen collection, media for the isolation of these agents, staining used for microscopic examination and special procedures will be discussed. Lectures will cover those fungal agents that affect man including dermatophytes, superficial mycoses and subcutaneous mycoses. Lecture, 2 hours. Credit: 2 semester hours.

4161 Clinical Bacteriology II (CLS)
This course covers in depth the biochemical identification of other Gram negative organisms such as nonfermenting Gram negative rods and Vibrio. Anaerobic organism’s role in disease as well as identification is also covered. Less frequently seen organisms such as the spirochetes and Chlamydia are also discussed. Mycobacteria and their differences in specimens processing, culturing, identification and staining are introduced. A brief review of clinical virology is also included. Discussion also includes application of molecular diagnostics to microbiology as well as immunodiagnostics that can be used to detect infectious diseases. Lecture, 3 hours. Credit: 3 semester hours.

4162 Clinical Immunology II (CLS)
This course will cover infectious and non-infectious diseases and those laboratory tests used for their diagnosis. The discussion will include the characteristics and principle of the test, importance of quality control and reference ranges and the advantages and limitations of each procedure. Some of the diseases covered will include syphilis, hepatitis, infectious mononucleosis, rheumatoid disorders, Lyme’s disease and HIV. Lecture, 1 hour. Credit: 1 semester hour.

4163 Clinical Immunohematology II (CLS)
This course will cover red blood cell platelet preservation, metabolism, and current trends in their use. Donor selection, processing and component preparation will be introduced. Also discussed is the HLA system, hemolytic anemias and transfusion therapy and reactions. New concepts in molecular biology, safety, quality control and quality assurance will also be covered. Lecture, 2 hours. Credit: 2 semester hours.

4164 Clinical Hematology II (CLS)
The course will present to the students the various diseases of erythrocytes and Leukocytes to include all anemias, leukemias, lymphomas and other red cell and white cell disorders. Correlation between instrument results, microscopic analysis and medical information will enable the student to recognize and assess these conditions. Specific laboratory tests utilized for diagnosis of anemias and leukemias will be taught and results evaluated. Molecular detection and monitoring of hematologic malignancies will be presented in its use as a diagnostic tool for genetic/chromosome disorders. Students will perform and evaluate manual and automated Cell Profiles and differentials in the laboratory and compare the results obtained from each as well as all other procedures from special testing that is required of them. Lecture, 2 hours. Credit: 2 semester hours.

4165 Application, Analysis and Lab Practice in Clinical Chemistry II (CLS)
This course discusses the assessment of renal function, creatinine metabolism and renal control of acid-base balance and liver function tests for hepatitis, cirrhosis and
other liver disorders, bilirubin metabolism and analytical aspects of liver enzymes and their relation to specific organs of the body. The chemistry and metabolism of proteins along with various testing methodologies are analyzed. Carbohydrate metabolic disorders; analysis and diagnosis are discussed. The testing and analysis of toxic and therapeutic drugs including investigation of toxic agents, antibiotics, cardiac medication, analgesics, antidepressants, heavy metals, drugs of abuse and related testing methodologies are presented. Clinical aspects of hormones and receptors are discussed along with the testing methods. Molecular diagnostics will be covered where applicable. Lecture, 4 hours. Credit: 4 semester hours.

4166 Urinalysis and Body Fluids II (CLS)
This course includes the study of the diseases of the kidneys to include: Acute and Chronic Renal Failure, Nephrotic Syndrome, Glomerulonephritis, and Pyelonephritis etc. The various fluids of the body will be discussed such as Cerebral Spinal Fluid, Pleural, Peritoneal etc. All tests used to diagnose conditions related to these diseases will be covered. Lecture, 2 hours. Credit: 2 semester hours.

4167 Mycology and Parasitology II (CLS)
This course will continue the introduction of the student various parasites that infect man. Emphasis will be on protozoa including amoeba, flagellates, ciliates, and coccidia. Staining of clinical material and important characteristics for diagnosis will be discussed. Diagnosis of malaria and microfilariae found in the blood will also be examined. Intestinal and tissue nematodes will be included in this course. Continuation of important fungal agents will also be included. These include the systemic fungi, yeast and yeast-like organisms and the Actinomycetes. Lastly, contaminants will be discussed as possible causes of opportunistic infections and their identification in the laboratory. Lecture, 2 hours. Credit: 2 semester hours.

4168 Clinical Education, Management and Research (CLS)
This course will introduce the student to educational methodologies used in clinical laboratory science program. Topics covered include in-service education, continuing education and laboratory interdepartmental rotation. Teaching mechanisms, objectives and testing methodologies will be discussed. Students are exposed to the management including various agencies accrediting the laboratory, financial management and reimbursement, staffing, job analysis and the role of human resources in laboratory management. The basics of research as applied to the clinical laboratory will also be discussed. Topics will include research protocols, adherence to the protocols, data collection methods and analyzing of results of data obtained. Lecture, 1 hour. Credit: 1 semester hour.

Pharmacy and Administrative Sciences (PAS)

The following courses are PAS courses:

2201 Introduction to Pharmacoeconomics
Prerequisites: MTH 1250, MTH 1260, PAS 2301. This course is designed to provide the student with introductory concepts of pharmacoeconomics as it relates to patient care. Overview of economic principles, which may enhance the understanding of the theory underlying pharmacoeconomic analysis, will be integrated in this course. A special emphasis is also placed on applying the economic evaluation and quality of life concept to improve the allocation of limited health care resources. Lecture. Credit: 3 semester hours.

2301 Social Aspects of Pharmacy Practice
Prerequisites: CPP 1101. This course is designed to introduce the student to the social aspects of pharmacy practice. Important areas to be discussed include the pharmacy as a profession, professionalization of the student, and the image of pharmacist held by patients. The role of the pharmacist in various practice settings as related to patient care and interaction with other health care professionals will be explored. An overview of how the pharmacist plays a key element in drug therapy, drug product selection, and therapeutic interchange will also be discussed. Special emphasis will be placed on understanding the social aspects of drug use in today’s society and the importance of providing pharmaceutical care to the patient. Credit: 1 semester hour.

3301 Pharmacy and The U.S. Health Care Environment
Prerequisite: PAS 2201. This course is designed to introduce the students to the U.S. health care delivery system and explore the social, political, and economic factors, which influence the flow of pharmaceutical products and services within the system. Special emphasis will be placed on the role and function of pharmacy in the new paradigm of ever-changing health care. An overview of the current structure and financing will be provided. Focus will be given to the public and private sectors of health care, the major players, the pharmaceutical industry, third party plans, and managed care. In addition, the role of the pharmacist in health promotion and disease prevention will be emphasized. Credit: 3 semester hours.

3352 Communication Techniques in Pharmacy
This course is designed to provide the student with opportunity of employing promotional techniques as a method of communication between the community pharmacy practitioner and the public. The aspects of pharmaceutical promotion, and copy writing will be discussed as well as the methods employed by the pharmaceutical manufacturer to familiarize medical and pharmaceutical practitioners with the knowledge of pharmaceutical products that are marketed. Lecture, 2 hours. Credit: 2 semester hours.

3353 Contemporary Legal Issues Affecting the Pharmaceutical Industry
Prerequisite: PAS 2301. The purpose of this course is to introduce students to contemporary legal issues that affect pharmacy practice and their role as employees, potential employers and consumers in the health care industry. Students will learn about changes in employment law and business law and be introduced to risk management issues, privacy issues and alternative dispute resolution techniques. Elective. Credit: 2 semester hours.

3354 Contemporary Issues in Hospital Pharmacy
Corequisite: PAS 2301. Hospital pharmacy history, theory, techniques, and administrative procedures. It acquaints the student with the pharmacy as a hospital department and the pharmacist’s role within the institution and the health care system. Elective. Credit: 2 semester hours.

3355 Environment of Pharmaceutical Marketing
Prerequisites: PAS 2201; PAS 2301. This course is designed to provide the student with a thorough overview of marketing in the pharmaceutical industry. Elective. Credit: 2 semester hours.

3356 Quality Issues in Managed Care Pharmacy
Prerequisite: PAS 2301; PAS 3301. This course is designed to provide the student with an overview of the issues related to the medication use process within the managed care setting. Elective. Credit: 2 semester hours.

3357 Computer and Pharmacy Data Management
Prerequisites: CPP 1101; PHR 1101. This course is designed to introduce students to up-to-date computer terminology, hardware and application programs for Pharmacy information systems. The major focuses are on the understanding of technical aspects of pharmacy computer system and the development of pharmacy database management skills. Didactic components are offered in the instructional computer classroom. Hands-on experience with database software packages such Microsoft ACCESS® is provided through student use of open computer labs. Elective. Credit: 2 semester hours.

3401 Personnel Management Issues in Health Care Institutions
The objective of this course is to develop skills in the Allied Health student to handle interpersonal issues confronted among and between professionals and the patients they serve in health care institutions. Because of the interdependent nature of leadership
and management across a spectrum of management process in health care institutions, this course incorporates application with theory and emphasizes critical thinking, problem solving, and decision making. Case studies and learning exercises will promote critical thinking and interactive discussion. Students will enhance their problem-solving skills by connecting real-life experiences to the content of the course. Content in key areas relevant to health care institutions, such as supervision, staffing, transformational leadership, motivation, delegation, organizational, political, and personal power, and time management will be strengthened. Lecture, 3 hours. Credit: 3 semester hours.

3402 U.S. Health Care Delivery
This course is designed so the radiologic scientist will understand the various methods of health care delivery to remain knowledgeable in the changing face of technology. The political context of health care organization and delivery, with specific focus on the mechanisms for policy formulation and implementation will be discussed. Lecture, 3 hours. Credit: 3 semester hours.

3951 Research in Administrative Science I
An elective course designed to familiarize the student with basics associated with the design, implementation, and data analysis essential to conducting research in Industrial Pharmacy, Cosmetic Science, and the administrative areas of pharmacy practice. The student is required to conduct an actual research project under the guidance of the faculty member in an area of mutual interest to both student and faculty member. Credit: 3 semester hours.

3952 Research in Administrative Sciences II
An elective designed to familiarize the student with basics associated with the design, implementation, and data analysis essential to conducting research in Industrial Pharmacy, Cosmetic Science, and the administrative areas of pharmacy practice. The student is required to conduct an actual research project under the guidance of the faculty member in an area of mutual interest to both student and faculty member. Credit: 3 semester hours.

4201 Health Care Law for Practitioners
This course is designed to introduce students to the legal issues that have an impact on the delivery of care in the American health care system and influence the ability of health care professionals to competently practice their professions. It will also survey current federal and New York State regulatory schemes governing the provision of health care. Lecture, 3 hours. Credit: 3 semester hours.

4202 Health Care Finance
This course provides the student with a broad overview of the health care organizations financial challenges. Students will learn the financial challenges of health care organizations including: enhancing revenues, managing costs, accessing capital at reasonable rates, and ensuring the integrity of financial reporting. Lecture, 3 hours. Credit: 3 semester hours.

4305 Pharmacy Law
Prerequisites: PHI 1000C; PHI 2240; PHI 3000C. The purpose of this course is to provide the students with an understanding of the legal basis of pharmaceutical care. As professional persons empowered by state licensure to protect patients from risks, students will learn about the responsibilities of the pharmacists under the law and the limits of their responsibilities. Pharmacist’s role in preventing liability by reducing drug-related morbidity will be covered. Principles of criminal and civil liability and business and business and contract law where applicable to pharmacy practice are included. Specific attention is given to rules of professional conduct as defined by the New York State Board of Pharmacy. Credit: 2 semester hours.

5202 Pharmacy Management and Advanced Pharmacoeconomics
Prerequisites: PAS 2201; PAS 3301; PAS 4305. This course provides the student with a broad information base essential to successful pharmacy management and efficient resource allocation in various professional practice settings. Students learn to apply management principles; planning, organizing, directing, and controlling in operating pharmacy resources. The course prepares pharmacy students to address change, increase competitiveness, and optimize patient’s services. Credit: 4 semester hours.

6205 Personal Management in Pharmacy Practice
Prerequisites: ALL fifth-year courses; PAS 5202. As pharmacy students move from school to practice, they may find they are supervising technicians and their peers. This course will help them prepare for their supervisory role by addressing the pharmacy supervisor’s foremost concern: planning, controlling, directing, and staffing—the four key components of supervision. With case studies and examples, ways to motivate employees, how to bring about change, workplace rules and expectations, reward, discipline, complaints and grievances, this course will enable students to be better enhancers of the environment for optimal patient care. Elective. Credit: 3 semester hours.

6206 Fundamentals of Regulatory Affairs
Prerequisites: ALL required fifth-year courses: This course will provide students with a fundamental understanding of the general principles of regulatory affairs in the pharmaceutical and biotechnology industry. It will introduce the basic concepts of drug discovery and the drug approval process, foundations of GXP, ethical considerations of scientific inquiry and the regulatory scheme involved. Elective. Credit: 3 semester hours.

6208 Health Care Data Analysis and Interpretation
Prerequisites: ALL required fifth-year courses; CPP 4402. This course is designed for those students who seek to enhance their skills in clinical and health care services research and to extend their knowledge in drug literature assessment. The purpose of this course is to provide an adequate working knowledge of SAS and to offer a fundamental base of technical skills for statistical data evaluations. SAS is the most accepted statistical tool in health care research field and has been accepted as an FDA standard for accepting and archiving data sets. The student will learn the strategy and skills in how to prepare, organize, analyze data and interpret the results. Hands on experience with real data from a wide variety of applications will be offered to enable students to master the skills needed for effective data management, data analysis, and interpersonal communication as it applies to pharmacy practice from a patient-focused approach. It highlights the importance of the pharmacist’s responsibility in communicating with patients and other healthcare providers. Specific attention is devoted to strategies that improve the pharmacist’s decision-making and communication skills. The intertwining of the didactic and actual pharmacist interactions will prepare the student for the real world environment. The knowledge and skills gleaned from this course will assist the student with the planning and execution of communication activities routinely encountered by the practicing pharmacist. Elective. Credit: 3 semester hours.
Radiologic Sciences Courses (RAD)

The following courses are RAD courses:

1101 Introduction to Radiologic Sciences
An introduction to the field of radiology technology explains the guidelines of the program, developments of the field, organizational structure of the radiology Department and an introduction to the standards for radiographers promoting professional conduct. This course also includes basic radiation protection, the value of patient rights and the role of the radiographer. Introductory law, the elements of malpractice and cause for actions, employment issues, contracts, litigation and the radiographers responsibility to deliver healthcare that is free from bias will also be discussed. Lecture, Credit: 2 semester hours.

1103 Radiologic Sciences Patient Care and Pharmacology
Prerequisites: All pre-professional courses. Corequisites: RAD 1104, 1106, 1110, 1114, 1125. This course provides students with the basic concepts of patient care, including consideration for the physical and psychological needs of the patient and family. Routine and emergency patient care procedures are described as well as infection control procedures utilizing universal precautions. The role of the radiographer in patient education and radiation protection are identified. This course also includes a systematic study of radiographic contrast agents as they are used in specific organ systems of the body. Basic concepts of pharmacology will be discussed. The theory and basic practice of basic techniques and venipuncture for the administration of diagnostic contrast agents and/or intravenous medications are included. Lecture, Credit: 2 semester hours.

1104 Medical Terminology
Prerequisites: All pre-professional courses. Corequisites: RAD 1103, 1106, 1110, 1114, 1125. A good working vocabulary is required of any medical professional. This course is designed to introduce medical terminology to the radiography student. The course will begin with a brief introduction to medical terminology, root words, suffixes, and prefixes. From there, the student will build a vocabulary involving specialists in medicine. After that, the student can develop a word bank for each system of the body. These include the Integumentary, Skeletal, Muscular, Circulatory, Respiratory, Digestive, Endocrine, Immune, Urinary, Reproductive, Nervous, and the Sensory Systems. Lecture, Credit: 2 semester hours.

1106 Radiographic Anatomy and Procedures I
Prerequisites: All pre-professional courses. Corequisites: RAD 1103, 1104, 1110, 1114, 1125. This course provides students with the skills necessary to perform radiographic examinations. Areas studied include body positions, positioning terms, positioning aids, contrast media and their applications to positioning methods of producing quality radiographs are discussed. A very brief introduction to the requirements of radiography will be discussed. After which, general anatomy and terminology will be discussed. Anatomy and positioning of the thoracic viscera will be discussed. Abdominal radiography will be discussed. Skeletal topics include positioning of the hand, wrist, forearm, elbow, and humerus. Lecture, Credit: 4 semester hours.

1107 Radiographic Anatomy and Procedures II
Prerequisites: All pre-professional courses and 3rd year fall semester courses. Corequisites: RAD 1111, 1115, 1131, 1126. This course provides students with the skills necessary to perform radiographic examinations of the lower extremities, spinal column and thoracic cavity. Areas studied include body positions, positioning terms, positioning aids and their applications to positioning methods of producing quality radiographs are discussed. Skeletal topics include shoulder, clavicle, scapula, foot, ankle, tibia and fibula, knee, femur, pelvis, hip, cervical spine, thoracic spine, lumbar spine, sacrum and coccyx, and the bony thorax. Clinical applications of theoretical areas include the skeletal and major organ systems, incorporating pediatric, geriatric examinations. Lecture, Credit: 4 semester hours.

1110 Radiographic Human Structure and Function I
Prerequisites: All pre-professional courses. Corequisites: RAD 1103, 1104, 1106, 1114, 1125. This course will acquaint the student on the structure and function of the human body. Cells, tissues, organs and organ systems will be described and discussed as components of their respective systems. Emphasis to physiology and clinical application will give the students a better understanding of anatomical concepts. Lecture, Credit: 3 semester hours.

1111 Radiographic Human Structure and Function II
Prerequisites: All pre-professional courses and 3rd year fall semester courses. Corequisites: RAD 1107, 1111, 1131, 1126. This course is a continuation of Radiographic Human Structure and Function I. Students will complete their study of the human body and the organs within their respective organ system. Organs and systems will be described and discussed. Organs will be discussed as components of their respective systems. Organs and systems described will include the respiratory system, digestive system, urinary system, reproductive and fetal development system. Emphasis is placed on physiology and clinical applications to give the student a better understanding of the anatomical concept. Lecture, Credit: 3 semester hours.

1114 Radiation Physics and Imaging Equipment I
Prerequisites: All pre-professional courses. Corequisites: RAD 1103, 1104, 1106, 1110, 1125. These courses provide the student with the knowledge of fundamental principles of mathematics essential for mastering radiographic physics, basic physics, mechanics, structure of matter, basic electricity, magnetism, electromagnetism, electrical physics, radiation physics, and basic x-ray circuitry. Production of ionizing radiation, interaction between x-rays and matter, aspects of the emission spectrum and radiation units of measurements are discussed. Radiographic equipment including the x-ray tube, fluoroscopy, and the imaging system as a whole will be discussed. Lecture, Credit: 3 semester hours.

1115 Radiation Physics and Imaging Equipment II
Prerequisites: All pre-professional courses and 3rd year fall semester courses. Corequisites: RAD 1107, 1111, 1131, 1126. These courses provide the student with the knowledge of basic electricity, magnetism, electromagnetism, electrical physics, radiation physics, and basic x-ray circuitry. Production of ionizing radiation, interaction between x-rays and matter, aspects of the emission spectrum and radiation units of measurements are discussed. Radiographic equipment including the x-ray tube, fluoroscopy, and the imaging system as a whole will be discussed. Lecture, Credit: 3 semester hours.

1131 Introduction to Mammography
Prerequisites: All pre-professional courses and 3rd year fall semester courses. Corequisites: RAD 1107, 1111, 1115, 1126. The student will examine the history of mammography, along with the basic concepts for performing mammography. Areas of study include breast anatomy and physiology, patient positioning, compression, clinical image evaluation, image
techniques and processing, pathology, QA/QC of mammographic equipment and MQSA Federal Guidelines. Lecture, 1 credit.

2105 Advanced Radiation Protection and Radiation Biology
Prerequisites: All pre-professional courses and 3rd year fall semester courses. Corequisites: RAD 2108, 2117, 2124, 2127. An advanced level course designed to address the need for radiation protection, biological effects of ionizing radiation. Patient protection, personal radiation monitoring, and radiation measuring instrumentation, as well as applicable state and federal laws are discussed. The interaction of radiation on biologic systems, and their correlation with concepts studied in Physics, Biology and Physiology. Acute and chronic effects of radiation are discussed. Lecture, Credit: 3 semester hours.

2108 Radiographic Anatomy and Procedures III
Prerequisites: All pre-professional courses and 3rd year fall semester courses. Corequisites: RAD 2105, 2117, 2124, 2127. This course provides students with the skills necessary to perform radiographic examinations. Areas studied include body positions, positioning terms, positioning aids, contrast media and their applications to positioning methods of producing quality radiographs are discussed. Skeletal topics include positioning of the soft tissue neck, skull, sinus, orbits, facial bones, and mandible. Fluoroscopic procedures include Esophagram, Upper GI Series, Barium Enema, and Intravenous Pyelogram. Lecture, Credit: 4 semester hours.

2109 Radiographic Anatomy and Procedures IV
Prerequisites: All pre-professional, 3rd year professional courses, 4th year fall semester professional courses. Corequisites: RAD 2123, 2132, 2133, 2128. This course provides students with an understanding of the advanced imaging techniques required for producing image of specialized areas of the body. Anatomy, indications, specialty procedures, contrast media, equipment and positioning are discussed. Introduction to advanced imaging areas such as CT, MRI and PET scanning are discussed along with the advanced education requirements necessary for certification in these and other areas. Many of these examinations are done within the confines of the imaging department, but may not necessarily be routine diagnostic procedures. Specialized equipment and/or specially trained personnel may be involved in offering these services. Specialty exams discussed include Arthrography, Myelography, Venography, Central Nervous System including Angiography, and Hysterosalpingography with a brief introduction to cross-sectional anatomy Lecture, Credit: 4 semester hours.

2117 Medical Imaging Principles of Radiographic Exposure
Prerequisites: All pre-professional, 3rd-year professional courses, 4th-year fall semester professional courses. Corequisites: RAD 2105, 2108, 2124, 2127. This course provides students with the various image processing systems available in radiography. A competency analysis of density, contrast, detail and distortion which govern and influence the production of a radiographic image and the direct effect these factors have on radiographic quality and patient dose. Lecture, Credit: 4 semester hours.

2123 Pathophysiology with Film Review
Prerequisites: All pre-professional, 3rd-year professional courses, 4th-year fall semester professional courses. Corequisites: RAD 2109, 2132, 2133, 2128. Content is designed to introduce theories of disease causation and the pathophysiologic disorders that compromise healthy systems. Etiology, pathophysiologic responses, clinical manifestations, radiographic appearance and management of alterations in body systems will be presented. All necessary QA/QC equipment as well as state and federal guidelines will be discussed. Lecture, Credit: 3 semester hours.

2124 Introduction to Quality Assurance
Prerequisites: All pre-professional, 3rd-year professional courses, 4th-year fall semester professional courses. Corequisites: RAD 2105, 2108, 2117, 2127. Content will include discussion of the integration of federal and state standards, role, responsibility, monitoring maintenance, program evaluation, and establishing and maintaining a quality diagnostic radiograph. The student will be able to identify the importance of quality control in today’s Radiology Department, and analyze how to enhance the imaging quality considering all the variables, and to discuss how effectively, the image quality can be tested and how to correct the problems. Lecture, Credit: 1 semester hours.

2132 Registry Review
Prerequisites: All pre-professional, 3rd-year professional courses, 4th-year fall semester professional courses. Corequisites: RAD 2109, 2123, 2133, 2128. The course is designed to prepare students for the American Registry of Radiologic Technology Certification exam and the New York State Licensing exam. This course will provide students with an overall review of all classes taken in the previous two years of coursework in preparation for the certification exam. Lecture, Credit: 3 semester hours.

2133 Computers in Radiologic Technology/ Digital Imaging
Prerequisites: All pre-professional, 3rd-year professional courses, 4th-year fall semester professional courses. Corequisites: RAD 2109, 2123, 2132, 2128. Content includes an overview of the basic principles of computer science allowing students to understand specific applications in radiography. The utilization of computers in healthcare settings and the specific uses in the departments of radiology and imaging are discussed in terms of technical concepts and clinical applications. Lecture, Credit: 1 semester hour.

1125, 1126, 1129, 2127, 2128, 2130 Clinical Education
Prerequisites: All pre-professional courses and previous semester courses. Corequisites: All professional courses in the semester. A well designed and developed competency based education at supervised clinical education sites. This provides the students with an active role in developing the skills required to deliver high quality imaging services. Objective competency evaluations are used for consistent methods of measuring student outcomes for each ARRT mandated part. Students will begin their clinical experience observing the technologist, and as they progress, and students have been tested didactically, they will work with direct supervision until competency has been achieved. After competency has been achieved the student may work under indirect supervision. 1575 hours total.

Elective Courses
Professional elective courses are made available by several departments of the College of Pharmacy and Health Sciences.

Non-professional electives may be selected from the courses offered by other departments of the University, with the approval of the appropriate Dean.

Those contemplating medical, dental, law or graduate study after graduation are advised to consult the appropriate school bulletin, since specific courses may be required for admission. Elective credits, may be utilized to satisfy these requirements.

Courses selected as electives must be approved in advance by the Dean of the College of Pharmacy and Health Sciences.
Department of Clinical Pharmacy Practice

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