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Joseph M. Brocovich, *Senior Associate Dean*, B.S. Pharm., Pharm.D.

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Sawanee Khongsawatwaja, *Associate Dean*, B.A., M.S.

Cathleen Murphy, *Associate Dean*, D.C., M.S.

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Emily M. Ambizas, *Assistant Dean*, B.S. Pharm., Pharm.D., MPH

John M. Conry, *Special Advisor–Strategic Initiatives*, B.S. Pharm, Pharm.D.

Patricia Haas, *Academic Advisor*, B.A., M.S.

William Malone, *Director*, B.S., M.S.

Steven Ferriolo, *Academic Advisor*, B.A., M.H.C.

Tai Hong Kim, *Academic Advisor*, B.A., M.H.C.

Anthony Marziliano, *Director*, B.A., M.S.

Carla Hernandez-Goodman, *Assistant Director*, B.S., M.S.

Diana J. Patino, *Assistant Director*, B.S., M.S.

Statement

The College of Pharmacy and Health Sciences commits to academic excellence, scholarship and service to humanity through the discovery and application of biomedical knowledge.

We facilitate and advance scholarship by offering innovative programs of study utilizing active learning approaches that are student-centered, outcomes-oriented and that inspire lifelong learning.

As compassionate health care professionals and scientists, we serve humanity through our dedication to excellence in health care and biomedical research. Building on a commitment to cultural diversity and benefiting from our metropolitan location and strategic alliances with the leading health care institutions, we strive to serve as effective leaders, good citizens and moral and ethical individuals.

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.

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 model of distinctiveness for the preparation of exemplary health care providers dedicated to meeting the needs of all patients particularly the medically underserved in urban areas, distinguished scholars and leading researchers in the pharmaceutical and biomedical sciences.

The following areas 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
- Manage and use resources of the health care system to promote health and provide, assess, and coordinate safe, accurate and time-sensitive medication distribution
- Demonstrate knowledge of informatics
- Collect, interpret, and analyze professional, lay, and scientific literature to disseminate accurate drug information and counseling to patients, their families or care givers, and other health care providers

- Design a patient-specific medication regimen including the selection of appropriate agent, dosage form, formulation, route of administration and/or delivery systems to improve therapeutic outcomes of medication use
- Determine, recommend, and monitor dose and dosing schedules by applying the principles of pharmacokinetics and pharmacodynamics
- Counsel patients effectively about their medication regimens in terms of efficacy and toxicity
- Monitor patients' progress effectively with regard to drug therapy
- Demonstrate the ability to successfully manage a patient-centered practice
- Demonstrate the ability to promote health improvement, wellness, and disease prevention in the community

Goal 3: Address issues of ethical behavior and social responsibility in pharmacy, critically and reflectively in accordance with the Vincentian Mission

- Identify the nature, range and scope of ethical considerations in pharmacy and relate the discussion to the principles of the "Oath of the Pharmacist"
- Describe situations that are ethically ambiguous and the actions you would take and relate the discussion to the principles of the "Oath of the Pharmacist"
- Demonstrate awareness and sensitivity to cultural diversity
- Explain continuing professional development.

Biomedical Sciences Program:

Development of critical thinkers with proficiency in scientific methods who are capable of meeting the evolving needs of the biomedical field;

Preparation of students for entry into medical and/or dental schools, other healthcare-related professional degree programs, as well as graduate programs (M.S. and/or Ph.D.) in biomedical/ pharmaceutical sciences;

Provision of analytical skills and laboratory techniques routinely applied in biomedical and pharmaceutical research;

Development of students' written and verbal communication skills, which will enable them to formulate concise and accurate reports and to communicate with the scientific community;

Development of biomedical professionals who practice within a legal and ethical framework.

Clinical Laboratory Sciences (CLS) Program:

- Goal 1: Demonstrate basic knowledge of clinical laboratory sciences
- Goal 2: Demonstrate competency in the biomedical sciences
- Goal 3: Illustrate and apply the ethical principles of a laboratory professional
- Goal 4: Demonstrate effective oral and written skills
- Goal 5: Satisfy the objectives of the professional/clinical year
- Goal 6: Demonstrate accuracy and precision in the performance of laboratory analyses

Radiologic Sciences (RAD) 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

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 who intend to matriculate for the Pharm.D., C.L.S., P.A., and TOX degree include Chemistry and Biology in their high school programs. High school Physics is also recommended.*

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. Standardized tests (SAT/ACT) are optional for all programs.

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 applicants are admitted to the Pharm.D. on a space-available basis only. Because of the extremely competitive entrance requirements and high retention rate, this program rarely admits transfer applicants (internal or external). Selected 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, 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.

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 and incorporates the 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, administrative 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 of all essential aspects 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. (<http://www.stjohns.edu/academics/schools-and-colleges/college-pharmacy-and-health-sciences/student-resources/doctorate/doctor-pharmacy-specific-policies-procedures-and#Technical%20Standards>)

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. The senior (professional) year of the program, accredited by NAACLS (National Accrediting Agency for Clinical Laboratory Sciences), provides didactic instruction in all areas of laboratory medicine concurrently with clinical rotations at 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 the 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 professional coursework 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.

Biomedical Sciences

The Bachelor of Science degree in Biomedical Sciences is a four-year program which will provide an interdisciplinary academic program of study that will foster competencies in areas related to biomedical sciences as well as core competencies in the liberal arts and sciences. The program will offer two tracks of study: administrative science and basic science. Since the healthcare industry contains a wide range of professions, the administrative track will prepare graduates to identify and address administrative, management, and policy issues within the healthcare industry. The basic science track will prepare graduates for further education and training in clinical practices and advanced scientific research within the health sciences.

Minors Approved for Pharmacy Students

Biology
Business
Chemistry
Health and Human Services
Philosophy
Psychology
Public Administration and Public Service
Sociology
Social Justice
Theology and Religious Studies

Minors Available for Health Sciences

(Biomedical Science, Clinical Laboratory Sciences, Toxicology, and Radiologic Sciences)

Business
Chemistry
Computer Science
English
French
German
Government and Politics
Health and Human Services
History
Italian
Philosophy
Psychology
Russian
Sociology
Spanish
Theology

Accreditation

The Doctor of Pharmacy 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 (naacsls.org).

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

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.

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

Doctor of Pharmacy students must achieve an overall and a math/science/professional GPA of 3.0 or better to interview for progression into the first professional year (3rd year) of the program. All other students will be evaluated for eligibility on a case by case basis by the program's Subcommittee on Progression.

Once progressed into the first professional year (3rd year) of the pharmacy program, students may receive no more than three (3) letter grades below a C in the professional phase of the pharmacy program (years 3–6). If a student receives two letter grades less than C, the student will be placed on an academic success plan. If a student receives a fourth grade less than C, the student will be referred to the Doctor of Pharmacy Subcommittee on Progression and be subject to dismissal from the Pharmacy Program.

In addition, all professional courses with a letter grade less than C will be considered an inadequate grade and will be treated as if the student failed the course (except for GPA calculation). Students will be required to repeat the course and will not be permitted to take courses for which the course with the inadequate grade is a prerequisite. Students who fail to receive an adequate grade (letter grade greater than C) after two attempts will be subject to dismissal.

Students are required to maintain an overall grade point average of 2.0 to remain in good academic standing and to graduate from the program.

<http://www.stjohns.edu/academics/schools-and-colleges/college-pharmacy-and-health-sciences/student-resources/doctorate/doctor-pharmacy-specific-policies-procedures-and#Criteria>

All students must meet the program's progression criteria in order to enter the professional years (years 3–6) of the Doctor of Pharmacy program. To be considered for progression, all students must attain a cumulative math/science/professional courses grade point average of 3.0 (letter grade of B) by the end of the second year. Additionally, all students must demonstrate satisfactory written and oral communication skills prior to entering the third year. The latter two criteria are mandated by the program's accreditation agency, the Accreditation Council for Pharmacy Education (ACPE). In order to meet this mandate, all pharmacy students

will complete an in-person interview with two faculty members prior to the third year of the program. Students are also required to clear an annual criminal background check during their professional years in order to participate in the program's experiential learning activities. In the event that an evaluation reports a positive finding, the student will be reviewed by the Dean. If the offense prohibits the student from qualifying for a Pharmacy intern permit, he/she may be dismissed from the program.

A pharmacy major will be required to successfully complete a competency examination before beginning the advanced pharmacy experiential portion of the program.

Biomedical Sciences

Students must maintain a programmatic GPA of 2.0, and an overall GPA of 2.0. Students that fall below the minimum requirement will be placed on probation if the GPA is repairable in one semester. If a student is unsuccessful to increase the programmatic or overall GPA above the minimum requirement they will be recommended for dismissal.

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 progression into 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.

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 drinker 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 /alcohol 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, and Radiologic Sciences programs must complete annual criminal background checks and must complete HIPAA training.

Pharmacy students participating in experiential programs are required to have a medical examination, an immunization series, health, accident and sickness insurance. Some experiential sites may require other tests or documentation (i.e., urine drug testing). Experiential education requires attendance at off-campus sites. Travel and housing, if needed, are the responsibility of the student.

Additionally, these students must purchase malpractice and/or pharmacy insurance through the University, and must complete PHR 5000.*

Pharmacy students may not take an elective or required didactic course concurrently with the advanced experiential courses. Clinical Laboratory Sciences, and Radiologic Sciences students may take an elective or didactic course in concurrently with the clinical rotation courses.

In the Clinical Laboratory Sciences and Radiologic Sciences programs, students entering the clinical sites for the professional year(s) are required to have a medical examination, an immunization series, health, accident and sickness insurance for the duration of their professional studies. Some clinical sites may require other tests or documentation (i.e. criminal background check, urine drug testing). Additional requirements may be stipulated by the clinical sites. Clinical rotation requires attendance at off-campus sites. Travels, meals, and housing (if applicable), are the responsibility of the student.

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

Pharmacy Intern Permit

Upon completion of their first professional year, students are required to obtain a New York Pharmacy Intern Permit by submitting a form and fee directly to the State office.

All Pharmacy students must meet the State requirements for the intern permit. Failure to obtain a Pharmacy Intern Permit will exclude the student from participating in both introductory and advanced experiential components 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 and/or Federal Government 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 in New York State, write: New York State Board of Pharmacy in New York, 89 Washington Avenue, 2nd Floor, Albany, NY 12234.

Clinical Laboratory Sciences

The Clinical Laboratory Sciences program offered by the College of Pharmacy and Health Sciences meets the educational requirements of the Department of Education and has been deemed licensure-qualifying. Successful completion of the professional component of the Clinical Laboratory Sciences program allows the student to apply for admission to the American Society for Clinical Pathology (ASCP) MLS certifying exam.

Successful completion of courses leading to the BS degree and passing the ASCP certifying exam allow graduates to obtain a New York State Department of Education license to practice as a Clinical Laboratory Technologist.

Radiologic Sciences Certification

The Radiologic Sciences program offered by the College of Pharmacy and Health Sciences meets the educational requirements for admission to the American Registry for Radiologic Technologists (ARRT) certification examination in Radiography. Successful completion of courses leading to the BS degree and passing the ARRT certifying examination allow graduates to obtain a New York State Department of Health license to practice as a Radiologic Technologist.

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 email at pharmacyce@stjohns.edu

The Academic Success Center (ASC)

Joseph V. Etzel, Pharm.D.

Associate Dean for Student Affairs

The Academic Success Center (ASC) was developed to provide academic support to enhance student success in the various programs offered on the undergraduate level of the College of Pharmacy and Health Sciences. Tutoring services are provided for discipline specific courses that may not be available through the services provided by University Learning Commons. Additionally, the ASC provides workshops and presentations on various topics pertinent to student success including time management, study skills, and test taking. These services are made available in the College's Health Education Resource Center (HERC, St. Augustine Hall, Room B40) in an inviting and collaborative environment that encourages, promotes, and fosters independent learning skills.

Affiliate Clinical Pharmacy Sites

Pharmacy Clinical Coordinators:

Emily M. Ambizas, B.S. Pharm., Pharm.D., MPH, *Assistant Dean for Pharmacy Experiential Education*

Philip McAvoy, B.S. Pharm., M.S., Pharm.D.

Frank Nania, B.S. Pharm., Pharm.D.

Andrea Watson, B.S. Pharm., Pharm.D.

(sites subject to change)

Academy of Managed Care Pharmacy

ACME Savon Pharmacy

Acurity Inc.

Admera Health

Affinity Health Plan

AID Healthcare Foundation

Alliance Pharmacy

Allergan

American Regent, Inc. / Luitpold

Americare Pharmaceutical Services

Annadale Family Pharmacy

Apthorp Pharmacy

Avanti Health Care

Bay Ridge Rx Specialty Pharmacy

Bayer Healthcare

BellMeade Pharmacy

Belle Harbor Chemists

Bellevue Hospital Center

Best Care Pharmacy

Bethpage Pharmacy

Bristol-Myers Squibb

BronxCare Specialty Care

Brookhaven Memorial Hospital

Canton-Potsdam Hospital

Cardinal Health Nuclear Pharmacy Services

CareMed Pharmacy

Catholic Health Services

CDM New York

Cherokee Indian Hospital

Centers for Disease Control

City Chemists

Clinical Solutions Corporation

Clover Health

Columbia University Medical Center

Columbo Pharmacy

Coney Island Hospital

CVS Health

Dale Drugs

Duane Reade

Elmhurst Hospital

Emblem Health Pharmacy Services

FCB Health

Ferring Pharmaceuticals

Fidelis Care New York

Flushing Hospital Medical Center

Food and Drug Administration

Franklin Square Pharmacy

Franwin Pharmacy

Good Samaritan Hospital

Guardian Consulting Services

Gurwin Jewish Nursing and Rehabilitation Center

Hackensack Meridian Palisades Medical Center

Halethorpe Pharmacy

Hamilton Park Rehabilitation and Nursing Center

Harpell Chemists

HealthFirst Management Services

Health Mart Pharmacy

Health Smart Pharmacy

Hill Pharmacy

Hospital for Special Surgery

Jacobi Medical Center

Jamaica Hospital Medical Center

Jericho Pharmacy

Jewish Home Lifecare

Jones Drug Store

Jubliant Radiopharma

LI Script

Lincoln Medical Center

Little Neck Drug Store

Marben Pharmacy

Meijer Specialty Pharmacy

Memorial Sloan Kettering Cancer Center

Mercy Medical Center

Midtown Pharmacy

Monter Cancer Center

Montefiore Medical Center

Montefiore New Rochelle

Mount Sinai Hospital

Nassau University Medical Center

Neergard's Pharmacy

New Jersey Pharmacist Association

New London Pharmacy

New Victory Pharmacy

New York City Health + Hospitals

New York City Poison Control Center

New York-Presbyterian Columbia University Medical Center

New York-Presbyterian Lawrence Hospital

New York-Presbyterian Queens

New York-Presbyterian Weill Cornell Medical Center

Northport VA Medical Center

Northwell Health:

Northwell Health Long Island Jewish Medical Center

Northwell Health North Shore University Hospital

Northwell Health Cohen Children's Medical Center

Northwell Health Glen Cove Hospital

Northwell Health Huntington Hospital

Northwell Health Long Island Jewish Forest Hills

Northwell Health Long Island Jewish Valley Stream

Northwell Health Phelps Hospital

Northwell Health Plainview Hospital

Northwell Health Syosset Hospital

Northwell Health South Shore University Hospital

Northwell Health Stern Family Center for Rehabilitation

Northwell Health Geriatric Medical Group

Northwell Health Division of General Internal Medicine

Novartis Pharmaceuticals

Nuclear Diagnostic Products of LI

Nyack Hospital

NYHTC & HANYC Harlem Health Center

NY State Council of Health-System Pharmacists
 NYU Hospitals Center
 NYU Winthrop University Hospital
 NYUPN Clinically Integrated Network
 Omnicare of Plainview
 Orange Regional Medical Center
 Paramount Specialty Pharmacy
 Parker Jewish Institute for Health Care and Rehabilitation
 Peconic Bay Medical Center
 Perla Pharmacy
 PetNet Pharmaceuticals
 Pfizer, Inc.
 Phelps Memorial Hospital
 PQA (Pharmacy Quality Alliance)
 Precision Pharmacy of Bellmore
 PRI Healthcare Solutions
 Queens Hospital Center
 Radioisotope Life Sciences
 Richmond University Medical Center
 Rite Aid Pharmacy
 Rock Ridge Pharmacy
 Rockville Centre Pharmacy
 Roslyn Pharmacy
 Ryan Medical Pharmacy
 S&M Pharmacy
 Sagamore Children's Psychiatric Center
 Salzman Chemists
 Senior Whole Health
 Shuang Ho Hospital (Taipei, Taiwan)
 Silver Rod Pharmacy
 SmartPharma
 South Oaks Hospital / Broadlawn Manor Nursing Care Center
 Southampton 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. Marys Hospital for Children
 Stony Brook University Hospital
 Stop & Shop Pharmacy
 Sunrise Pharmacy
 Target /CVS Pharmacy
 Teresa Pharmacy
 The Burke Rehabilitation Hospital
 The Medicine Shoppe The SocioEsthetician
 Thrift Drugs
 Town Drug & Surgical
 Town Pharmacy
 Town Total Compounding Center
 Umamah Pitkin Pharmacy
 The University Hospital
 VA Hudson Valley Health Care System

Valley Hospital Lukow Pavillion
 Value Mart
 Village Pharmacy
 Vivo Health Pharmacy
 Walgreens Pharmacy
 Wal-Mart Stores, Inc.
 Walter Reed National Military Medical Center
 Wayne's Pharmacy
 Westchester Medical Center
 West Hempstead Pharmacy
 Windsor Pharmacy & Surgicals
 World's Fair / Total Care RX
 Wyckoff Heights Medical Center

Affiliate Clinical Laboratory Sciences Sites

Lisa Hochstein, B.S., M.S., *Program Director*
(sites subject to change)

Flushing Hospital Medical Center
 Jamaica Hospital Medical Center
 Long Island Jewish Medical Center
 New York Presbyterian/Queens
 Northwell Health System Labs
 NYU Langone Medical Center
 NYU Langone-Long Island
 St. Francis Hospital
 True Tox Labs
 Wyckoff Heights Medical Center

Affiliate Radiologic Sciences Sites

Jennifer Chiu, B.S., M.B.A., Ed.D., *Program Director*
(sites subject to change)

Lenox Hill Radiology & Medical Imaging Associates, PC
 Kingsbrook Jewish Medical Center
 Jamaica Hospital Medical Center
 Main Street Radiology
 Memorial Sloan Kettering Cancer Center
 Montefiore Medical Center
 New York Presbyterian/Queens
 NYU Langone - Long Island

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 Konecni Scholarship
 Peter J. Aterno 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. Krauss 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
 Clinical Excellence Award CVS Pharmacy Scholarship
 Ralph DePalma Jr. Memorial Scholarship Award
 Eli-Lilly Achievement Award
 Facts and Comparisons Award for Excellence in Clinical Communications
 Glaxo SmithKline Patient Care Award
 Gertrude L. Dourdounas Certificate of Achievement Award Health Professions Award
 Indo-American Pharmaceutical Society Award
 JM Long Foundation Scholarship Award
 Bruce Kay Memorial Award
 Herb and Patricia Kett Scholarship
 Korean American Pharmaceutical Association Award
 Long Island Pharmacist Society, Inc. Award
 Vincenzo J. Mantia Memorial Scholarship
 Ralph Martorana Award
 Merck and Co., Award
 Anthony J. Monte-Bovi Award
 Mylan Pharmaceuticals, Inc. Award
 National Community Pharmacists Association (NCPA) Student Achievement Award (Sponsored by Bristol Myers Squibb)
 New York City Society of Hospital Pharmacists Award
 Nicole Montalbano Research Excellence Award

Outstanding Research Performed by a
Graduating Toxicology Major Award
Pfizer U.S. Pharmaceuticals Outstanding
Leader Award
Pharmaceutical Society of the State of
New York Award
Phi Delta Chi Award
Phi Lambda Sigma Leadership Award
Physician Assistant Academic Excellence Award
Rho Chi Society Research Award
Rho Chi Society Scholarship Award
Rite-Aid Award
Roche Pharmacy Communication Award
Alfred and Michael Seul Memorial Student
Life Award
St. Luke Physician Assistant Award
St. Luke/St. Martin de Porres Award
TEVA Award
Vincent DePaul Toxicologist Award
Joseph Balkon Toxicology Leadership Award
Christine Veal Award
Maryann Veltri Award
Walgreen's Award
Wal-Mart Scholarship Award
Westchester Society of Health-System
Pharmacists
Ann Paula Zero Academic Excellence Award
Please contact the Office of the Dean for
information regarding scholarship and awards.

Academic Student Organizations

Pharmacy Honor Society

The Beta Delta Chapter of the Rho Chi Society, the national pharmaceutical honor society seeking the advancement of the pharmaceutical sciences through encouragement and recognition of high scholarship and research, was established at St. John's University in 1954. 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.

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.

Radiologic Sciences Honor Society

The Epsilon Chapter of Lambda Nu, the national radiologic sciences honor society seeks to foster academic scholarship at the highest academic levels, promote research and investigation in the radiologic and imaging sciences, and recognize exemplary scholarship. Third and Fourth year students in the professional phase of the program with a professional GPA of 3.0 and higher and are nominated on a basis of their service and leadership are eligible for induction into this 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
RCT 1005C*	3
PAS 2301	1
TOTAL	17

Spring Semester

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

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

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 3203	1
PHS 3604	1
PHS 3303	1
Elective	2
TOTAL	16

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
TOTAL	18

Note: The bracketed courses will be taught sequentially.

Spring Semester

CPP 6101	3
CPP 6102	3
PHR 6101	2
Professional Elective	3
Professional Elective	3
PHR 5000+	0
TOTAL	14

Note: + Course required for APPE's.

Sixth Year

Fall Semester

APPE Rotations	12
CPP 5203	5
TOTAL	17

Spring Semester

APPE Rotations	15
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There are a total of nine Advanced Pharmacy Practice Experiences (APPEs) in the entry-level Doctor of Pharmacy Program. The rotations are divided in four-week blocks at three credits each. The rotations are as follows:

Required APPE Rotations

1. CPP 5413 Advanced Community Pharmacy
2. CPP 5414 General Inpatient Care
3. CPP 5407 Ambulatory Care Clerkship
4. CPP 5415 Focused Inpatient Care or CPP 5417 Ambulatory Care II or CPP 5418 Advanced Community II
5. CPP 5416 Health Systems Pharmacy

Elective APPE 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

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 1250	3
CHE 1110/1/2	4
ALH 2101	2
THE 1000C	3
DNY 1000C	3
TOTAL	18

Spring Semester

ENG 1100C	3
MTH 1260	3
CHEM 1120/1/2	4
BIO 2000	3
BIO 2001L	1
PHI 1000C	3
TOTAL	17

Second Year

Fall Semester

CHEM 1130/1/2	4
PHS 3103	3
PHS 3104	1
PHY ELECTIVE	3
PHI 2200/2240	3
LANG1 OR LAC1000	3
TOTAL	17

Spring Semester

SOC SCI ELECT	3
PHS 3105	3
PHS 2101	3
PHS 3101	3
PHI 3000C	3
LANG2/FINE ART/MUSIC	3
TOTAL	18

Third Year

Fall Semester

TOX 1401	3
TOX 1402	1
TOX 4413	3
TOX 4414	2
THE 2XXX	3
SPE 1000C	3
TOTAL	15

Spring Semester

BIO 2280/1	4
BIO 3460/1	4
HIS 1000C	3
THE 3XXX	3
PHS 4204	3
TOTAL	17

Fourth Year

Summer Semester*

ALH 4140	2*
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Fall Semester

ALH 4148	3
ALH 4149	1
ALH 4153	2
ALH 4154	3
ALH 4155	4
ALH 4156	2
ALH 4157	2
TOTAL	17

Spring Semester

ALH 4150	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 128 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 1250	3
CHE 1210/1/2	5
DNY1000C	3
HIS 1000C	3
TOTAL	17

Spring Semester

ENG 1100C	3
MTH1260	3
CHEM 1220/1/2	5
BIO 2000	3
BIO 2001L	1
TOX 1101	1
TOTAL	16

Second Year

Fall Semester

CHE 2230/1/2	5
PHS 3103	3
PHS 3104	1
PHY 1610/11/12	4
TOX 2403	3
TOTAL	16

Spring Semester

CHE 2240/41	5
PHS 3105	3
PHY 1620/21/22	4
THE 1000C	3
PHI 1000C	3
TOTAL	18

Third Year

Fall Semester

TOX 1401	3
TOX 1402	1
TOX 3405	4
PHI 2200/2240	3
THE 2XXX	3
PHS 3101	3
TOTAL	17

Spring Semester

PHS 2201	4
PHS 2301	1
TOX 3406	4
PHS 3509	2
SOC SCIENCE	3
THE 3XXX	3
TOTAL	17

Fourth Year

Fall Semester

TOX 4404	4
TOX 4405	1
TOX 4413	3
TOX 4414	2
LAC 1000c or Lang 1	3
PHS 3951 (opt)	3
TOTAL	13-16

Spring Semester

TOX 4403	4
TOX 4412	4
Fine art/music or Lang 2	3
PHI 3000C	3
PHS 3952 (opt)	3
TOTAL	14-17

Radiologic Science

(Minimum of 128 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
DNY 100C	3
THE 1000C	3
PHI 1000C	3
SPE 1000C	3
TOTAL	15

Spring Semester

PAS 3402	3
ENG 1100C	3
RAD 1101	2
MTH 1050	3
Soc. Sci.	3
HIS 1000C	3
TOTAL	17

Second Year

Fall Semester

PHI 2200 or 2240	3
Language I or LAC 1000C	3
THE 2XXX	3
PAS 3401	3
PAS 4201	3
RAD 1110	3
TOTAL	18

Spring Semester

Language 2 or Fine Arts	3
THE 3XXX	3
PAS 4202	3
PHI 3000C	3
RAD 1111	3
PHY 1360	3
TOTAL	18

Third Year

Fall Semester

RAD 1203	4
RAD 1206	4

RAD 1114	3
RAD 1127	1
TOTAL	12

Spring Semester

RAD 1207	4
RAD 1208	3
RAD 1115	3
RAD 1129	4
RAD 1128	3
TOTAL	18

Summer Semester*

RAD 1150	0
TOTAL	0

Fourth Year

Fall Semester

RAD 2105	3
RAD 2124	1
RAD 2127	3
RAD 2207	3
RAD 2208	4
TOTAL	*14

Spring Semester

RAD 2109	4
RAD 2123	4
RAD 2132	3
RAD 2211 or RAD 2213	2
RAD 2128	3
TOTAL	*16

**summer tuition may apply*

B.S. Biomedical Science

(Minimum of 121 semester hours)

First Year

Fall Semester Credits

BIO 1000	4
CHE 1210/1211, 1212	5
DNY 1000C	3
THE 1000C	3
FYW 1000C	3
TOTAL	18

Spring

BIO 2000/2001L	4
CHE 1220/1221, 122	5
MTH 1260	3
SPE 1000C	3
BMS 1000	1
TOTAL	16

Second year

Fall	
CHE 2230/2231	5
PHS 3103	3
MTH 1250C	3
PHI 1000C	3
THE 2XXX	3
TOTAL	17

Spring	
CHE 2240/2241	5

PHS 3104	1
PHS 3105	3
PAS 2500	3
PHI 2200C	3
HIS 1000C	3
TOTAL	18

Third year

Fall

PHY 1610/1611/1612	
OR Science elective	4 or 3
BMS 2200/2201	4
PAS 3402	3
ENG 1100C	3
TOTAL	13-14

Spring

PHY 1620/1621/1622	
OR Science elective	4 or 3
BMS 2400/2401	4
Social science elective	3
PHS 3101	3
PAS 2000	
(if opted for science elective)	2
TOTAL	14-15

Fourth year

Fall

LANG 1 OR LAC 1000C	3
THE 3XXX	3
CPHS ELECTIVES	6
TOTAL	12

Spring

LANG 2 OR Fine Art/Music	3
PHI 3000C	3
CPHS ELECTIVES	6
TOTAL	12

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.*

4107 Drugs and Diseases of the Respiratory Systems

Prerequisites: ALL courses of the first three years. This course is designed to instruct the student in the area of respiratory 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.*

4109 Introduction to Drugs and Diseases

This course is designed to introduce the student to the patient evaluation process and the therapeutic management of special populations in select diseases of the skin, connective tissue, gout and glaucoma. Teaching emphasis will be a sequential method of instruction relevant to these disease states to incorporate the areas of pathophysiology, pharmacology, medicinal chemistry, and therapeutics (including 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.*

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.*

4201 Pharmacy Practice Laboratory III

Prerequisites: ALL required third-year course work. Corequisites: PHR 4105; PHR 4109; PHR 4110; PHS 4601. 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.*

4202 Pharmacy Practice Laboratory IV

Prerequisites: ALL required third-year course work; PHS 4601. PHR 4201 Corequisites: PHR 4107; PHR 4111; PHR 4112. This laboratory will integrate the didactic course work of the Drugs and Diseases courses and Extemporaneous Compounding and provide the student the opportunity 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 four 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 fourth 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 naturopathy as alternative therapies to mainstream medicine will also be covered. *Credit: 2 semester hours.*

6103 Leadership Development in Pharmacy Practice

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. *Credit: 3 semester hours.*

6104 Critical Care

Prerequisites: All courses through the fourth 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 Health Professions Course Offerings (CHP)

Tina Kanmaz, Pharm.D., Chair and Clinical Professor

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).

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.*

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.*

4148 Clinical Bacteriology (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 infection 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 as a means to identify these organisms is presented. The diseases caused by these organisms is also included and discussed. Includes clinical practicum. *Credit: 2 semester hours.*

4149 Immunology for Clinical Laboratory Science (CLS)

This course is composed of the study of cellular and antigen-antibody reactions. Topics covered include 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. The latest laboratory testing methods that aid in the diagnosis of bacterial, viral and parasitic diseases are presented to the students. Includes clinical practicum. *Credit: 2 semester hours.*

4150 Clinical Bacteriology and Virology (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 specimen 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. Includes clinical practicum. *Credit: 2 semester hours.*

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. *Includes Clinical Practicum. 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. *Includes Clinical Practicum. 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. *Includes Clinical Practicum. 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. *Includes Clinical Practicum. 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, trematodes 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. *Includes Clinical Practicum. Lecture, 2 hours. Credit: 2 semester hours.*

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. *Includes Clinical Practicum. 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 for special testing that is required of them. *Includes Clinical Practicum. 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. *Includes Clinical Practicum. Lecture, 4 hours. Credit: 4 semester hours..*

4166 Urinalysis and Body Fluids II (CLS)

This course includes the study of the diseases of the kidney 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. *Includes Clinical Practicum. 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. *Includes Clinical Practicum. 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.*

4170 Advanced Seminar in Clinical Laboratory Sciences (CLS)

This course will prepare students for the transition to entry-level clinical laboratory technologists. It will expose students to information on both NY State licensure and the ASCP Board of Certification (BOC) examination application. In addition, job search strategies including resume writing, and interviewing preparation will be discussed. Published examination review sources and computer mock exams will be

used as framework for students to practice and develop experience with analysis and synthesis of laboratory produced data. Case studies will be used to reinforce material taught in lecture. Students will also prepare a portfolio documenting their professional year. *Credit: 2 semester hours.*

Clinical Pharmacy Practice (CPP)

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.*

1153 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 Essentials of Pharmacy Practice

This course is designed to introduce the student to skills necessary to provide patient oriented pharmacy services. This course is designed to introduce the student to the essential skills necessary to provide patient centered care. This course will discuss ethical, cultural, professional issues encountered in health care practice. *Credit: 2 semester hours.*

3203 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 52 hours and one*

credit experiential hours (one four-hour day per week for 13 weeks) Credit: 1 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

(See 3951) *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; PHS 3508; PHS 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.*

5203 Experiential Pharmacy II

Prerequisites: CPP 3203. 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: 5 semester hours.*

**This is a longitudinal pharmacy practice learning experience. It will begin in fall of fourth year and must be completed by fall of fifth 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 4602. 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 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 direct interaction with patients, may involve managerial aspects of pharmacy practice or research pertaining to pharmacy practice. *Credit: 3 semester hours.*

5407 Ambulatory Care I

Prerequisites: ALL required courses through fifth year and successful completion of the competency examination. The course is a required advanced pharmacy practice experience (APPE) designed to ensure student pharmacist preparedness for entry-level practice. This experience provides the student an opportunity to practice and enhance skills relative to the application of utilizing the Pharmacist's Patient Care Process (PPCP) to patients in the ambulatory care setting. Students are expected to become active members of the healthcare team by monitoring patients' drug therapy, providing therapeutic recommendations, and counseling patients. Emphasis will be placed on pharmacist-patient

relationships and collaboration in order to promote and deliver safe medication use. In addition, students will develop value based patient care plans, practice communication skills, and ensure an optimal patient care experience. The goal of this course is to provide adequate experience to enhance knowledge and skills acquired through didactic education and Introductory Pharmacy Practice Experiences (IPPEs) and apply them to direct patient care activities in an ambulatory care setting. *Credit: 3 semester hours.*

5413 Advanced Community Pharmacy Practice I

Prerequisites: ALL required courses through fifth year and successful completion of the competency examination.

This course is a required Advanced Pharmacy Practice Experience (APPE) designed to ensure student pharmacist preparedness for entry-level practice in a community setting. The experience provides the student the opportunity to practice and enhance their skills relative to the application of the Pharmacist's Patient Care Process (PPCP) to patients in the community setting. The learning outcomes of the experience are concentrated in four aspects of community pharmacy practice: patient care through prescription processing, pharmacist-assisted self-care, immunization services, and the provision of Medication Therapy Management services. Other areas of practice that may be experienced include disease management, preventative health screening, prescription compounding, management, and/or other advanced practice activities. The goal of the course is to provide adequate experience to enhance knowledge and skills acquired through didactic education and Introductory Pharmacy Practice Experiences (IPPEs) and apply them in direct patient care activities in a community setting.

Credit: 3 semester hours.

5414 General Inpatient Care

Prerequisites: ALL required courses through fifth year and successful completion of the competency examination.

This course is a required advanced pharmacy practice experience (APPE) designed to ensure student pharmacist preparedness for entry-level practice in a general inpatient setting. The experience provides the student the opportunity to practice and enhance their skills relative to the application of the Pharmacist's Patient Care Process (PPCP) to patients in a general inpatient 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 relationships, team dynamics and collaboration in order to promote and deliver safe medication use, develop value based patient care plans,

communication skills and ensure an optimal patient care experience. This experience is fundamental in developing the abilities outlined in the Doctor of Pharmacy Program Outcomes statement. The goal of the course is to provide adequate experience to enhance knowledge and skills acquired through didactic education and Introductory Pharmacy Practice Experiences (IPPEs) and apply them in direct patient care activities in a general inpatient setting. *Credit: 3 semester hours.*

5415 Focused Inpatient Care

Prerequisites: ALL required courses through fifth year and successful completion of the competency examination and successful completion of CPP 5414.

This course is an advanced pharmacy practice experience (APPE) designed to ensure student pharmacist preparedness for entry-level practice in a focused inpatient setting. The experience provides the student the opportunity to practice and enhance their skills relative to the application of the Pharmacist's Patient Care Process (PPCP) to patients in the inpatient 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 focused inpatient population. Emphasis will be placed on pharmacist-patient relationships, team dynamics and collaboration in order to promote and deliver safe medication use, develop value based patient care plans, communication skills and ensure an optimal patient care experience. This experience is fundamental in developing the abilities outlined in the Doctor of Pharmacy Program Outcomes statement. The goal of the course is to provide adequate experience to enhance knowledge and skills acquired through didactic education and Introductory Pharmacy Practice Experiences (IPPEs) and apply them in direct patient care activities in a focused inpatient setting. *Credit: 3 semester hours.*

5417 Ambulatory Care II

Prerequisites: ALL required courses through fifth year and successful completion of the competency examination and successful completion of CPP 5407.

The course is an advanced pharmacy practice experience (APPE) designed to ensure student pharmacist preparedness for entry-level practice. This experience provides the student an opportunity to practice and enhance skills relative to the application of the utilizing Pharmacist's Patient Care Process (PPCP) to patients in the ambulatory care setting. Students are expected to become active members of the healthcare team by monitoring patients' drug therapy, providing therapeutic recommendations, and counseling patients. Emphasis will be placed on pharmacist-patient relationships and collaboration in order to promote and deliver safe medication use. In

addition, students will develop value based patient care plans, practice communication skills, and ensure an optimal patient care experience. The goal of this course is to provide adequate experience to enhance knowledge and skills acquired through didactic education and Introductory Pharmacy Practice Experiences (IPPEs) and apply them to direct patient care activities in an ambulatory care setting. *Credit: 3 semester hours.*

5418 Advanced Community Pharmacy Practice II

Prerequisites: ALL required courses through fifth year and successful completion of the competency examination and successful completion of CPP 5413.

This course is a required Advanced Pharmacy Practice Experience (APPE) designed to ensure student pharmacist preparedness for entry-level practice in a community setting. The experience provides the student the opportunity to practice and enhance their skills relative to the application of the Pharmacist's Patient Care Process (PPCP) to patients in the community setting. The learning outcomes of the experience are concentrated in four aspects of community pharmacy practice: patient care through prescription processing, pharmacist-assisted self-care, immunization services, and the provision of Medication Therapy Management services. Other areas of practice that may be experienced include disease management, preventative health screening, prescription compounding, management, and/or other advanced practice activities. The goal of the course is to provide adequate experience to enhance knowledge and skills acquired through didactic education and Introductory Pharmacy Practice Experiences (IPPEs) and apply them in direct patient care activities in a community setting. *Credit: 3 semester hours.*

6101 Case Studies in Drugs and Diseases Issues in Pharmaceutical Care

Prerequisites: ALL courses through fourth 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 fourth 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 fourth 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 predominantly 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 fourth 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 fourth 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 fourth 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 Comprehensive 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. 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 fourth 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 fourth 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: CPP 3201. 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.*

6116 Vincentian Health Care: Caring for the Underserved

This course will demonstrate to students how health care professionals can apply the University's Vincentian mission in providing health care for the underserved/poor. The course will expose the student to the sociology of poverty and its impact upon illness and healthcare delivery. The special health care needs of the underserved/poor experiencing health disparities will be emphasized. The course will address the health care needs of poor patients, including homeless individuals, newly arrived poor immigrant groups and the working poor. The challenges that patients encounter attempting to access health care and medicine, and the challenges that health care professionals must overcome to provide care to poor patients, will be addressed. *Credit: 3 semester hours.*

6117 Pharmacist as an Immunization Provider

This course will prepare the student to actively participate in a pharmacy-based immunization program. It will provide a comprehensive overview of the role of the pharmacist as an immunization provider and prepare the student to apply the pharmacist's patient care process to immunization services. *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.*

1110 Radiographic Human Structure and Function I

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

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 third 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.*

1203 Patient Care and Medical Terminology in Radiologic Sciences

Prerequisites: All pre-professional courses. This course provides students with the basic concepts of optimal patient care, including consideration for the physical and psychological needs of the patient and family. A focus will be on ethical and legal issues surrounding patient care. Routine and emergency patient care procedures are described as well as infection control and medical terminology. This course also includes an introduction to a word-building system and an orientation to understanding radiographic orders and diagnostic report information, including abbreviations and symbols. The role of the radiographer in patient education and radiation protection is emphasized. Radiographic contrast agents and basic concepts of pharmacology will be discussed, as well as the basic techniques of venipuncture for the introduction of contrast agents and/or intravenous medications. *Lecture, Credit: 4 semester hours.*

1206 Radiographic Anatomy & Procedures with Lab I

Prerequisites: RAD 1110 and 1111. This course is designed to introduce the student to aging procedures with a focus on the radiographic anatomy and procedures of the thorax, abdomen and the upper extremity with consideration for pediatric, geriatric and trauma patients. Particular focus will be on how to distinguish between optimal and sub-optimal images and identify abnormalities related to any underlying pathology. Acceptable practices and principles are discussed and reinforced. Information will be reinforced through the use of active learning strategies such as, but not limited to, case studies, simulations and problem-based learning. *Lecture, Credit: 4 semester hours.*

1207 Radiographic Anatomy and Procedures with Lab II

Prerequisites: RAD 1206. This course will focus on the radiographic anatomy and procedures of the lower extremity, pelvic girdle, vertebral column and bony thorax with consideration for pediatric, geriatric and trauma patients. A focus will be on the ability to distinguish between optimal and sub-optimal images and identify abnormalities related to any underlying pathology. Acceptable practices and principles are discussed and reinforced. Information will be reinforced through the use of active learning strategies such as, but not limited to, case studies, simulations and problem-based learning. *Lecture, Credit: 4 semester hours.*

1208 Medical Imaging: Principles of Radiographic Exposure and Digital Imaging

Prerequisites: RAD 1114. This course is designed to familiarize students with the various imaging systems in radiography, including an emphasis on

digital imaging. A comprehensive analysis of technical, procedural, and geometric factors as they relate to and influence the production of a radiographic image is provided. The impact of the aforementioned factors on radiographic quality and patient dose is emphasized. *Lecture, Credit: 4 semester hours.*

2105 Advanced Radiation Protection and Radiation Biology

Prerequisites: All pre-professional courses and third 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.*

2109 Radiographic Anatomy and Procedures IV

Prerequisites: All pre-professional, third year professional courses, fourth 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.*

2123 Pathophysiology with Film Review

Prerequisites: All pre-professional, third-year professional courses, fourth-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, third-year professional courses, fourth-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, third-year professional courses, fourth-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.*

2207 Radiographic Sectional Anatomy

Prerequisites: RAD 1110, 1111, 1206, 1207. This course will focus on gross anatomical structures and their location in axial (transverse), sagittal, coronal, and orthogonal (oblique) planes. Illustrations and anatomy images will be compared with Magnetic Resonance (MR) and Computerized Tomography (CT) images in the same imaging areas and levels. Emphasis will be placed on characteristic appearances of each anatomical structure as it appears in CT and MR images. *Lecture, Credit: 3 semester hours.*

2208 Radiographic Anatomy and Procedures with Lab III

Prerequisites: RAD 1206, 1207. This course will focus on the radiographic anatomy and procedures for the various procedures related to the biliary system, gastrointestinal tract, urinary system and cranium with consideration for fluoroscopic studies, pediatric, geriatric and trauma patients. A focus will be on the ability to distinguish between optimal and sub-optimal images and identify abnormalities related to an underlying pathology. Acceptable practices and principles are discussed and reinforced. Information will be reinforced through the use of active learning strategies such as, but not limited to case studies, simulations and problem-based learning. *Lecture, Credit: 4 semester hours.*

2211 Introduction to Computed Tomography

Prerequisites: RAD 1115, 1208, 2207. This course will provide an introduction to the basic understanding of the operation

of computed tomography (CT) equipment. An overview of scanner components, data acquisition, digital imaging, image reconstruction, image analysis, image display and manipulation, and quality assurance will be provided. Current imaging applications will be explored and radiation protection will be emphasized. *Lecture, Credit: 2 semester hours.*

2213 Fundamentals of Mammography

Prerequisites: RAD 1110, 1111, 1203, 1208 *Corequisites:* RAD 2128. This mammography course introduces students to the concepts necessary to perform a mammogram. The focus will be on theories and practices inherent in standard and mammographic positioning, compression, breast anatomy and physiology, imaging techniques for breast pathology, clinical image evaluation, digital image processing, quality assurance/quality control QA/QC of mammographic equipment and the Mammography Quality Standards Act and Program (MQSA) Federal guidelines. *Lecture, Credit: 2 semester hours.*

1127, 1128, 1129, 1150, 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.

Pharmacy Administration and Public Health Course Offerings (PAH)

Jagannath Muzumdar, 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.

Pharmacy and Administrative Sciences (PAS)

The following courses are PAS courses:

2000 Introduction to Healthcare Informatics

This course will introduce the student to key areas in health informatics (HI), the field devoted to the optimal use of data and information to advance individual health, health care delivery and health-related research. Students will learn the history of HI and the role of Electronic Health Record (EHR) in advancing healthcare safety and quality, health data security and other emerging topics in Health Information Technology (HIT). Ongoing governmental efforts to protect individual health information will also be discussed. Upon successful completion of this course, students will gain an understanding of key elements and the application of HI in a variety of healthcare fields, such as HI infrastructure, systems interoperability, knowledge management and decision support systems, technology for communication, and data security. *Credit: 2 semester hours.*

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.*

2500 Introduction to Medical Economics

This course serves as an introduction to the role of economics in medicine. It builds on microeconomic and macroeconomic principles of supply and demand and covers topics such as the market for medical care, the market for health insurance, the role of government in health care and health care reforms. The economic principles and concepts in relation to healthcare will be incorporated in the course. *Credit: 3 semester hours.*

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 as 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.*

3501 Statistics for Biomedical Sciences

Prerequisites: Math 1250 and Math 1260. This course will allow the student to develop mastery of theories behind the most frequently used statistical methods in the field of biomedical sciences. Grounded on these theories, the student will develop skills that are necessary in selecting the appropriate statistical test for a given scenario. Student will develop computational abilities using in-vitro and in-vivo data by applying formulae. *Credit: 3 semester hours.*

3502 Behavioral Determinants of Health Care

Prerequisites: PAS3402. This course is designed to introduce the student to social concepts and processes that influence behaviors in healthcare. The course will provide an introductory background to the kinds of social and behavioral theories that guide our understanding of health-related behavior and explore some of the ways in which these theories and approaches may be used in health care practice and research. The course will also provide insights into psychosocial issues in health care and familiarize students with key sociobehavioral factors related to behavior change, community, organizational climate, and family. *Credit: 3 semester hours.*

3503 Introduction to Epidemiology

This course will provide students with a fundamental understanding of the general principles of epidemiologic methods and their application to identify emerging health problems and to improve population health. It will introduce key epidemiologic concepts such as measures of disease frequency, association, bias, confounding, as well as the main epidemiologic study designs. *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 sciences, 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.*

PAS 4501 Health Care Management

Prerequisites: PAS 3502. This course introduces students to healthcare management in a wide variety of health care settings such as hospitals, nursing homes, clinics, and home health care agencies. Students will examine principles of effective management including cost management, strategic planning and marketing,

information technology, organizational design, leadership, teamwork, and human resources. *Credit: 3 semester hours.*

4502 Health Care Marketing

Prerequisites: PAS 3402. To meet the demands of the dynamic health care market, this course is designed to deepen student's knowledge and skills of health care marketing by addressing how traditional promotional and business techniques are used in this industry. The course involves analysis, evaluation, and implementation of marketing strategies within the health care environment. *Credit: 3 semester hours.*

4503 Fundamentals of Regulatory Affairs

This course will provide students with a fundamental understanding of the general principles of pharmaceutical legislation and regulatory affairs in the pharmaceutical and biotechnology industry. It will introduce the FDA's laws and regulations as they relate to drug discovery and the drug approval process, foundations of GXP, ethical considerations of scientific inquiry and the regulatory scheme involved. *Credit: 3 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.*

6201 Self-Care Pharmaceuticals

Prerequisite: PHR 4105. This Course is designed to focus on the therapeutic aspects of self-care pharmaceuticals. The course will center on the pharmacist's role in making professional decisions concerning these medications and in providing advice to patients in selecting drugs for self-medication. *Elective. Credit: 3 semester hours.*

6202 Experimental Designs in Clinical Trials

Prerequisites: PHR 5106; PHR 5108. Clinical trial has a prominent role in the research and approval of new drugs. To conduct clinical trials, future pharmacists need an understanding of the various experimental designs used in research studies. This course will introduce the student to the terminology used to classify the design of a research study and to explore in detail observational research as represented by the case report, case control study, and cohort study. It will describe the study design characteristics that distinguish experimental research, as in clinical trial, from other types of drug research. Methods for enhancing validity

through the use of appropriate controls, randomization, and blinding will be discussed. *Elective. Credit: 3 semester hours.*

6203 Communication Skills for the Pharmacist

Prerequisites: ALL required fifth-year courses. This course exposes the student to 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.*

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 report presentation. Other statistical packages such as SPSS and BMDP will also be discussed. *Elective. Credit: 3 semester hours.*

6213 Operations of Managed Care Pharmacy

Prerequisites: All fifth-year courses. This course is designed to provide the student with an overview of key operating issues related to the management of prescription utilization within the managed care setting. The course emphasizes the design and provision of pharmacy benefits management services and assesses its impact on inputs, outputs, processes and participants to optimize patient care and outcomes. The major goal of the course is to familiarize students with current pharmacy benefit strategies used to provide safe, efficacious and cost-effective pharmaceutical care in extensive managed care demographic populations. *Lecture, 3 hours. Credit: 3 semester hours.*

Pharmaceutical Sciences Course Offerings (PHS)

Vijaya Korlipara, 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.*

2102 Inside-Out Prison Exchange

This class will meet once a week for 3 hours at Rikers Island and will be comprised of equal numbers of Inside (incarcerated) and Outside (university) students not to exceed 24. The pedagogy employs highly interactive, participatory process in which the professor acts as facilitator. Students will be challenged to describe the issue, identify, analyze and communicate the multiple determinants and suggest possible strategies to remedy these issues/crises. *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 3601, 3602. 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 3601, 3602. 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 the structure and function of the major 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 lymphatic 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 homogeneous liquid dosage forms. The course integrates fundamentals and theory with

the pharmaceutical dosage forms to which they best apply. This course also delineates methods and procedures essential to solving the mathematical problems typically associated with pharmacy practice. *Credit: 4 semester hours.*

3602 Pharmacy Practice Laboratory I

Corequisite: PHS 3601. This laboratory course enables the student to correlate the principles and theory with experimental observation of homogeneous systems and affords the opportunity to become familiar with the apparatus and techniques of measurement. Upon completion of the laboratory course, the student should be able to apply the important principles of pharmaceutical science and technology and to use the techniques in the preparation of stable homogeneous liquid dosage forms. *Laboratory: 3 hours. Credit: 1 semester hour.*

3603 Pharmaceutics II

Prerequisites: PHS 3601; PHS 3602. *Corequisite:* 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:* PHR 4201. 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 fourth 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: PHR 5201, and all courses taught through fourth 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: all required fourth 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 fourth 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 forth 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 fourth 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:

1101 Perspectives in Toxicology

Toxicology is the science that evaluates the safety and hazards of chemical and biological agents for people, animals, and the environment. This course will utilize lectures, active learning exercises and discussions to introduce students to the discipline of toxicology and how it is involved in protecting health and the environment. Students will also explore the sub-disciplines of toxicology and the career paths open to toxicologists. *Lecture, 1 semester hours.*

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 and 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 antiinfective/antineoplastic 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.*

4414 Analytical and Quantitative Toxicology Laboratory

Prerequisites: CHE 1210-1220 or equivalent, CHE 2230-2240 or equivalent. *Corequisites:* TOX 4413. Hands-on laboratory experiments with quantitative and qualitative analytical techniques and instruments in the areas of drug metabolism and forensic, environmental, pharmaceutical, and molecular toxicology. Laboratory, 6 semester hours. *Credit: 2 semester hours. Lab fee: \$120.*

5301 Toxicology and Drugs of Abuse

Prerequisite(s): All required courses in the first three 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.*

Biomedical Sciences (BMS)

The following courses are BMS courses:

1000 Introductory Seminar to Biomedical Science

This is an introductory course taken by students earning a Bachelor's degree in Biomedical Sciences (BMS) in their freshmen year. The goal of this course is to introduce the students to disciplines within Biomedical Sciences and to provide guidance to the students as they progress through the program, when assessing their options upon completion of their degree. From this course students will understand what they are expected to learn during their undergraduate education about their specialization and how to apply that knowledge towards careers in: 1) healthcare providers and allied healthcare professionals, 2) drug development and management, 3) health services management and pharmacy administration, 4) public health, 5) pharmaceuticals and medical devices industry, and 5) medical and biotechnology research. *Credit: 1 semester hour.*

2101 Public Health

This course will introduce students to the field of public health. This will include a description of government and non-governmental agencies and organizations that are part of the public health system. Also the political process leading to laws and regulations impacting the public health will be discussed. The application of public health to control of infectious diseases as well as chronic diseases will be explored. Socioeconomic factors impacting health and the health care system as a public health issue will be considered. The global dimensions of public health issues will be included in class discussions. *Credit: 3 semester hours.*

2200 Biomedical Biochemistry

Prerequisites: Biology 2000 and 3000 (or equivalent); General Chemistry I and II (or equivalent); Organic Chemistry I and II (or equivalent). This course provides information on the chemical features and physicochemical properties of the major classes of biomolecules present in the human body that are needed to understand the contributions of these biomolecules to cellular structure, body functions, intermediary metabolism, bioenergetics, nutrition, membrane composition and functions, solute transport and signaling mechanisms. *Credit: 3 semester hours.*

2201 Biomedical Biochemistry Laboratory

Corequisite: BMS2200. A laboratory course intended to reinforce the theoretical knowledge acquired in the classroom on the major classes of biomolecules through the application of fundamental principles and the performance of biochemical techniques and methodologies. *Credit: 1 semester hour.*

2300 Fundamentals of Pharmaceutics

Prerequisites: Completion of 2nd year in Biomed Sci Program. The subject of Physical Pharmaceutics deals with physical, chemical and biological principles of development, preparation, preservation and utilization of pharmaceutical dosage forms. Physical Pharmaceutics is a two-semester course. Physical Pharmaceutics – I deals with basic principles involved in the formulation of liquid dosage forms. *Credit: 3 semester hours.*

2301 Fundamentals of Pharmaceutics laboratory

Corequisite: BMS2300. This laboratory course will deal experiments and equipment demonstration of topics covered in Fundamentals of Pharmaceutics. *Credit: 1 semester hour.*

2400 Medical Microbiology

Prerequisite: BIO 2000, BIO 3000 or equivalent. This course will examine the basic biology of microorganisms including bacteria, viruses, fungi and parasites, with a special focus on pathogens. The course will explore the characteristic features of the organisms, mechanisms of infection and pathogenesis. Selected species will be studied to illustrate microbial mechanisms relevant to human disease. *Credit: 3 semester hours.*

2401 Medical Microbiology Lab

Corequisite: BMS 2400 Medical Microbiology. This laboratory course is intended to reinforce the theoretical knowledge acquired in the classroom on the basic biology of microorganisms with a focus on those implicated in human disease. Through active participation in laboratory activities, students will acquire practical skills and knowledge associated with microbiology. The laboratory will incorporate basic techniques including growth and culture of microorganisms, microscopy, including staining techniques, and laboratory testing techniques. Students

will be instructed in performing methods of biochemical and genetic identification of selected microorganisms, as well as current methods of determining antibiotic sensitivity for organisms relevant for human disease. *Credit: 1 semester hour.*

2500 Fundamentals of Pharmacology

Pre/corequisites: PHS 3103, 3105, Biology I and II (or equivalent), General Chemistry I and II (or equivalent), Organic Chemistry (or equivalent), Biopharmaceutical chemistry. This course will introduce the student to the major concepts of pharmacology for the Biomedical Sciences. Introduction to the major categories of drugs will be considered from the point of view of biochemical and molecular mechanisms of action, fundamental understanding of Drug-Receptor Theory, Dose-Response analysis, adverse effects, drug-drug interactions and clinical application of drugs. Specific areas covered following general introduction to pharmacology will include autonomic nervous system pharmacology, central nervous system pharmacology, gastrointestinal pharmacology, and the pharmacology of smooth muscle. *Credit: 3 semester hours.*

2501 Fundamentals of Pharmacology Laboratory

Corequisite: BMS 2500, Hands-on laboratory/exercises using in vivo and in vitro simulation approaches designed to introduce students to common experimental methods in pharmacology. *Credit: 1 semester hour.*

2600 Fundamentals of Medicinal Chemistry

Prerequisites or corequisites: Organic Chemistry I and II, Biomedical Biochemistry. This course focuses on fundamental principles of medicinal chemistry, including an understanding of drug structure-activity relationships, chemical characteristics of drugs and drug targets, prediction of physicochemical properties of drugs (acid-base properties, solubility, drug-receptor/enzyme interactions, basic knowledge of major pathways of drug metabolism and excretion, concept of prodrugs and soft drugs, chemical principles of pharmacokinetic, and pharmacodynamic, overview of drug discovery process and nomenclature of organic medicinal agents. *Credit: 3 semester hours.*

2601 Fundamentals of Medicinal Chemistry Laboratory

Corequisite: BMS2600. The overall goal of this laboratory is to provide hands-on experience with various laboratory techniques that are routinely practiced in medicinal chemistry research laboratories. In order to achieve this goal many skills such as determination of partition coefficient, determination of optical rotation, extraction and measurement of CYP450 protein, in vitro drug metabolism, monitoring reaction progress by chromatography, work-up procedures to separate organic compounds, chromatography of reactants alongside final products, recrystallization/purification, determination of melting point, qualitative colorimetric tests to

judge purity, molecular modeling to build 3D structures and prediction of physicochemical properties have to be developed. These skills will be taught through this well designed laboratory course. *Credit: 1 semester hour.*

2700 Clinical Immunology

This study of the body's defense systems will include structure of the lymphatic system and the specific and non-specific immune responses in humans. The emphasis is on principles of innate and adaptive defenses, antibody – antigen interactions, molecular biology of the immune response, genes controlling antibody synthesis, primary and secondary immune responses. An introduction to immunopathology, diagnostics utilizing immune molecules and immunotherapy will be included. *Credit: 3 semester hours.*

2800 Fundamentals of Pharmacogenomics

Prerequisites: All required 3rd year courses of the BS Biomedical Sciences—Basic Science Track; Corequisite: BMS2801. Students are versed in the scientific foundation of pharmacogenomics. Concepts from the principles of molecular biology in terms of the underlying genetic mechanisms that drive cellular function, the central dogma and functional concepts of molecular pharmaceutical science are reviewed and tied into the larger context of the genetic basis for disease and drug action, alteration of drug metabolism. Upon completion of the course students will possess a working framework of molecular pharmaceutical sciences, genomic scale analysis, pharmacogenomics, genotyping and the use of genome wide markers including single nucleotide polymorphisms. Students will be prepared to integrate new molecular technologies and paradigms as they emerge. The course stresses the use all resources available to health care professionals including online datasets and current research literature. *Credit: 3 semester hours.*

2801 Fundamentals of Pharmacogenomics Laboratory

Corequisite: BMS2800. The overall goal of this laboratory course is to assess how the presence of genetic markers and the expression of these gene products can alter response to pharmaceutical drugs. In order to achieve this goal many genetic, microscopy, molecular biology and human cell culture laboratory skills have to be developed. These skills collectively include bioinformatics and sequencing, karyotyping and intracellular staining, cloning and transfection to altered DNA content in cultured cell, nucleotide isolation and PCR, drug metabolism in cultured cells and cellular toxicity to drug delivery. *Credit: 1 semester hour.*

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Please visit the following webpage for a complete list of our faculty, including current part-time faculty. www.stjohns.edu/academics/undergraduate/pharmacy/faculty
