

**LIU Pharmacy**

**2013-2014**

**Professional Program  
and Graduate Bulletin**



**Arnold & Marie Schwartz College of Pharmacy and Health Sciences**

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# LIU Pharmacy

## 2013 - 2014 Professional Program & Graduate Bulletin

*75 DeKalb Avenue, Brooklyn, N.Y. 11201-5497*

*LIU Pharmacy General Information: 718-488-1234*

*[www.liu.edu/pharmacy](http://www.liu.edu/pharmacy)*

*Admissions: 718-488-1011*

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Notice to Students: The information in this publication is accurate as of September 1, 2013. However, circumstances may require that a given course be withdrawn or alternate offerings be made. Therefore, LIU reserves the right to amend the courses described herein and cannot guarantee enrollment into any specific course section. All applicants are reminded that the University is subject to policies promulgated by its Board of Trustees, as well as New York State and federal regulation. The University therefore reserves the right to effect changes in the curriculum, administration, tuition and fees, academic schedule, program offerings and other phases of school activity, at any time, without prior notice.

The University assumes no liability for interruption of classes or other instructional activities due to fire, flood, strike, war or other force majeure. The University expects each student to be knowledgeable about the information presented in this bulletin and other official publications pertaining to his/her course of study and campus life. For additional information or specific degree requirements, prospective students should call the campus Admissions Office. Registered students should speak with their advisors.

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### LIU

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Long Island University (LIU) is one of America's largest and most comprehensive private universities with locations and programs spanning the New York metropolitan area, overseas and online. World-class faculty, small classes and résumé-building hands-on learning experiences are the hallmarks of an LIU education.

The University offers nearly 500 academic programs and educates over 24,000 students in degree-credit and continuing education programs in Brooklyn, Brookville (LIU Post), Brentwood, Riverhead, and Rockland and Westchester (LIU Hudson). Its international unit, LIU Global, provides a wide range of study abroad options at overseas centers in China and Costa Rica, and through programs in Australia, South Africa, Taiwan, Thailand, Turkey and, beginning in 2015, Europe.

The accomplishments of more than 191,000 living alumni are a testament to the success of LIU's mission of "Access and Excellence." The institution also provides enrichment for students and neighboring communities, including the excitement of NCAA Division I and II athletics, internationally acclaimed arts programming at Tilles Center for the Performing Arts and the nationally renowned George Polk Awards in journalism.

#### **Accreditation and Program Registration**

LIU is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104, (215) 662-5606. The Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation. The degree and certificate programs also are approved and registered by the New York State Department of Education.

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## CAMPUSES OF LIU

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### The Residential Campuses

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#### LIU Brooklyn

LIU Brooklyn is distinguished by dynamic curricula reflecting the great urban community it serves. Distinctive programs encompass the arts and media, the natural sciences, business, social policy, urban education, the health professions, pharmacy and the health sciences, all on a pluralistic campus that draws insight and strength from differences.

Founded in 1926, LIU Brooklyn is the original unit of Long Island University. Its beautifully landscaped 11-acre campus is a self-contained urban oasis in the heart of downtown Brooklyn – steps away from the new Barclays Center, top arts venues like BAM and the hip restaurants and cafes of Fort Greene, and just a 10-minute subway ride from the professional and cultural opportunities of Manhattan.

LIU Brooklyn offers nearly 200 associate, undergraduate, graduate, doctoral and certificate programs, including Ph.D. programs in clinical psychology and pharmaceuticals, the D.P.T. in physical therapy and the Pharm.D. in pharmacy. Serving a diverse student body, its academic units include the Richard L. Conolly College of Liberal Arts and Sciences; the School of Business, Public Administration and Information Sciences; the School of Education; the School of Nursing; the School of Health Professions; and LIU Pharmacy (the Arnold & Marie Schwartz College of Pharmacy and Health Sciences). The campus is known for its nationally recognized Honors Program, which was the first of its kind in the country and emphasizes a holistic, liberal arts background.

LIU Brooklyn has a deeply rooted tradition of athletic excellence. The basketball teams of the 1930s captured two national championships, and the campus' success in sports has continued over the decades with numerous Northeast Conference championships. This year, the men's basketball team made history as the first team to win three NEC championships in a row and made their third consecutive trip to March Madness. The campus currently fields 16 NCAA Division I teams.

The \$45-million Steinberg Wellness Center, which features an NCAA-regulation swimming pool, a 2,500-seat arena, state-of-the-art workout facilities and a rooftop track, serves the campus and the surrounding community, and the Cyber Café provides a high-tech hot spot for students and faculty members to meet and eat.

#### LIU Post

LIU Post is distinguished by programs of excellence and small classes in five schools of study: College of Education, Information and Technology; College of Liberal Arts and Sciences; College of Management; School of Health Professions and Nursing; and School of Visual and Performing Arts. The wooded suburban campus, only 20 miles from New York City, is home to the renowned Tilles Center for the Performing Arts, Steinberg Museum of Art and WCWP-FM. LIU Post offers the Ph.D. in information studies, the Psy.D. in clinical psychology and the Ed.D. in interdisciplinary educational studies.

The campus was established on the former estate of cereal heiress Marjorie Merriweather Post in 1954 to accommodate the growing educational needs of Nassau County following World War II. Formerly known as the C.W. Post Campus of Long Island University, LIU Post offers its full-time, part-time and non-credit students a comprehensive range of nearly 200 associate, undergraduate, graduate and doctoral degree programs and certificates. In addition, the campus offers college credit courses to high school students in area schools.

LIU Post is recognized as one of the nation's most beautiful academic settings. Modern buildings range from an acclaimed student union to an elegant library. Beautiful red-brick academic buildings, including Humanities Hall, Pell Hall/Life Science and the Kahn Discovery Center, are outfitted with wireless classrooms, major-specific laboratories and computer centers. The campus's award-winning cooperative education program is nationally renowned for its extensive career counseling and job placement services.

Fifteen NCAA men's and women's sports teams take advantage of LIU Post's 70 acres of playing fields. Clubs, fraternities and sororities provide many other outlets for student activities. The campus's \$18-million Pratt Recreation Center is a state-of-the-art health and fitness facility featuring an eight-lane swimming pool, three full-size basketball courts, racquetball courts and an elevated jogging track.

Tilles Center for the Performing Arts, Long Island's premier concert facility, brings Carnegie Hall and Lincoln Center to the campus with world-class jazz, rock, folk music, dance, mime, orchestral and chamber music performances.

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## The Regional Campuses

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### LIU Brentwood

Since 1959, LIU Brentwood has served the diverse communities of western Suffolk County with premier undergraduate and graduate programs. Conveniently located on the Michael J. Grant Campus of Suffolk Community College, it offers access to a full range of amenities, including state-of-the-art library and computer resources, as well as personalized academic advisement and support services. Since LIU Brentwood is primarily a teaching institution, classroom instruction is its top priority. While most faculty members are involved in research, scholarly writing or creative activities appropriate to their discipline, all are measured against the highest standards of teaching excellence. Some programs require completing coursework at another LIU campus.

### LIU Hudson

For more than a quarter of a century, Long Island University has been offering graduate degree and certificate programs in Rockland and Westchester Counties. LIU Hudson at Rockland is conveniently located near the Palisades Parkway in Orangeburg, N.Y., just two miles from the New Jersey border. LIU Hudson at Westchester is located in a state-of-the-art facility on the grounds of Purchase College, which features high-tech classrooms designed for adult learners. Both centers boast technologically advanced library resources and mainframe-networked computer labs, and offer small classes with personalized instruction delivered by full-time and adjunct faculty members who bring a wealth of practical experience and an understanding of career trends to the classroom.

Students enroll as degree candidates or as non-degree students who wish to pursue graduate courses for personal enrichment or professional advancement. Most classes in Rockland and Westchester are held in the late afternoons, in the evenings and on weekends to meet the scheduling needs of working adults. Program offerings include: business (M.B.A. and/or advanced certificates in health care sector management and cyber security for business professionals); health or public administration (M.P.A. and advanced certificate in gerontology); educational leadership (M.S.Ed. and/or advanced certificate); education (M.S.Ed. and/or advanced certificate) in the areas of childhood – grades 1-6, early childhood, middle childhood and adolescence – grades 5-12, special education, autism, literacy, bilingual, TESOL, bilingual extension, gifted extension, writing and reading, school counseling and school psychology; marriage and family therapy (M.S.); mental health counseling (M.S.); and pharmaceuticals (M.S.) with specializations in industrial pharmacy and cosmetic science.

### LIU Riverhead

LIU Riverhead offers high-quality undergraduate and graduate courses and programs to residents of Long Island's East End. Conveniently located on Suffolk County Community College's Eastern Campus, just 10 minutes from exit 70 on the Long Island Expressway, it provides working adults and recent baccalaureate graduates with the opportunity to pursue a private education in conveniently scheduled day and evening programs.

Offerings include the upper division B.S. in childhood education (grades 1-6), the upper division B.A. in communication studies - new media, the M.S. in childhood education (grades 1 – 6), the M.S. in literacy education (birth – grade 6), the M.S. in teaching students with disabilities (grades 1 – 6 or generalist grades 7 – 12) and an advanced certificate in applied behavior analysis. In addition, an M.S. in homeland security management and advanced certificates in homeland security management and cyber security policy are offered fully online. The Homeland Security Management Institute features comprehensive curricula designed by professionals for professionals. Faculty members and guest lecturers include some of the top names in law enforcement, counterterrorism and government.

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## GENERAL INFORMATION

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### LIU Pharmacy - Arnold & Marie Schwartz College of Pharmacy and Health Sciences

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#### Over 125 Years of Tradition

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LIU Pharmacy — Arnold & Marie Schwartz College of Pharmacy and Health Sciences, the oldest unit of Long Island University, was established in 1886 as the "Brooklyn College of Pharmacy" by the Kings County Pharmaceutical Society. Objectives of the Society in creating the College included the following "...to improve the science and art of pharmacy by diffusing knowledge among the apothecaries and druggists, fostering pharmaceutical literature, developing talent for pharmaceutical pursuit and investigation, and stimulating discovery and invention in the several departments of the drug business."

In 1929, the Brooklyn College of Pharmacy affiliated with Long Island University, one of the largest independent universities in the United States. Located, since 1976, at the LIU Brooklyn campus, LIU Pharmacy attracts a diverse student population that strives to grow personally, intellectually and professionally in pharmacy and related fields.

The College serves as an urban leader in pharmacy education through its pursuit of excellence and innovation in teaching, scholarship and service. Forging alliances and partnerships with health-care providers and the pharmaceutical industry, the College has created a rich mosaic of programs that elevate student aspirations and are responsive to the health-care needs of society.

As an advocate for an expanded scope of pharmacy practice, the College creates new paradigms for collaborative practice models that will shape the future of the profession of pharmacy.

The College has completed more than 125 years of service to the state and the nation in the education of entry-level professional students and graduate students, many of whom have attained prominence in pharmacy and the other health professions.

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### Mission, Vision and Values

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#### Mission

The mission of LIU Pharmacy (Arnold & Marie Schwartz College of Pharmacy and Health Sciences) is to provide Access and Excellence in private higher education to individuals from the culturally and socioeconomically diverse Metropolitan New York region and beyond who seek to become pharmacists committed to the advancement of the profession and to those

persons who desire to become scientists devoted to research and innovation in the pharmaceutical and related sciences.

#### Vision

LIU Pharmacy strives to support the profession of pharmacy's vision for practice, research and education by providing an environment that:

- Prepares a continuing stream of new pharmacists well-prepared to deliver evidence-based medication therapy management and other pharmacy and health-related services as a part of interdisciplinary teams dedicated to patient-centered care and the general well-being of the public health
- Inculcates the commitment and collective participation of faculty, students and other stakeholders (such as alumni, members of the Council of Overseers, and University officers) toward fostering: innovation in practice; advancement of the basic, clinical and translational sciences; application of new educational strategies; and engagement of other health care professionals from across the disciplines
- Ensures, through the assessment and evaluation of desired outcomes and via continuous quality improvement measures, that student pharmacists are well equipped for evidence-based practice by acquiring a thorough didactic foundation in the biomedical, social/behavioral/administrative, pharmaceutical and clinical sciences as well as engaging in comprehensive experiences that foster the skills to apply the acquired knowledge to practice or enter PGY-1 residencies or fellowships following graduation
- Provides academic, professional, and co-curricular opportunities that aspire to transform our students into intellectually vigorous lifelong learners who are socially and professionally responsible global citizens
- Delivers graduate education programs that prepare individuals for teaching, research, and other careers in academia, the pharmaceutical industry and regulatory agencies
- Offers affordable, convenient and high-quality continuing professional education activities to maintain, advance and enhance the competencies and ongoing professional development of pharmacists and pharmacy technicians

#### Values

- LIU Pharmacy is committed to a culture that:
- Strives for quality and improvement in all facets of its mission and embraces assurance of the same by the encouragement of comprehensive assessment and evaluation
  - Celebrates the diversity of its students, faculty and other stakeholders in an environment that fosters their professionalism, collaboration, ethical behavior, leadership and scholarship by supporting and attending to their differing needs
  - Embraces demonstrated and innovative teaching strategies that enhance learning,

promote interprofessional collaboration, support the varied needs of students, and prepare learners for the continuum of lifelong education

- Supports the continuing professional development of pharmacists and pharmaceutical scientists through graduate programs, continuing professional education, faculty, staff and preceptor development, and other forms of postgraduate education and training
  - Encourages the involvement and innovation of stakeholders in maintaining and improving contemporary pharmacy practice and visioning for its future by engendering and enhancing professional skills through education, committing to the delivery of pharmacist-delivered patient-centered care and other services, and embracing the application of scientific advancements to practice)
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### Professional and Graduate Degrees

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LIU Pharmacy offers the entry-level Doctor of Pharmacy (Pharm.D.) degree and the following graduate programs: Doctor of Philosophy in Pharmaceutics (Ph.D.), and the Master of Science degree in Pharmaceutics with specializations in Industrial Pharmacy and Cosmetic Science, Drug Regulatory Affairs, and Pharmacology/Toxicology.

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### Membership

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LIU Pharmacy is an institutional member of the American Association of Colleges of Pharmacy ([www.aacp.org](http://www.aacp.org)), the national organization representing pharmacy education in the United States. The mission of the association is to both represent and be an advocate for all segments of the academic community in the profession of pharmacy.

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### Accreditation

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LIU's Doctor of Pharmacy program is accredited by the Accreditation Council for Pharmacy Education, 135 South LaSalle Street, Suite 4100, Chicago, IL 60603-4810, 312/664-3575; FAX 312/664-4652; Website: [www.acpe-accredit.org](http://www.acpe-accredit.org).

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### LIU Pharmacy Facilities and Services

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#### LIU Pharmacy (Main Building)

The three-story main building of LIU Pharmacy houses the Offices of the Deans and administrative staff. Adjacent to these offices is the Dean's Conference Room. In addition, the first floor of the building houses the Office of Student and Professional Affairs and the Office of Student and

Professional Activities. An office suite for the Division of Pharmaceutical Sciences is located in the basement of this building. The suite consists of offices for divisional faculty members and support staff as well as a conference room. The second floor of the building contains a student lounge, a faculty lounge, an office for student professional organizations, a lecture room, the Office of Continuing Professional Education and the Office of Development and Alumni Relations. The third floor of the main building houses the Pharmacy Student Computer Laboratory, the Graduate Programs Office, and a quiet study room for pharmacy students.

### **William Zeckendorf Health Sciences Center**

This six-story facility houses offices, classrooms, laboratories and student study spaces for LIU Pharmacy as well as the Schools of Nursing and Health Professions. The fifth floor is home to LIU Pharmacy's Division of Pharmacy Practice. In addition to faculty offices the floor contains several classrooms and a research laboratory for the Division of Pharmaceutical Sciences. The International Drug Information Center (IDIC) is also housed on the fifth floor. The Division of Pharmaceutical Sciences occupies the sixth floor of the building. In addition to division and faculty offices the sixth floor contains numerous research laboratories, a seminar room, a conference room and a study room for students.

### **Pharmacy Wet Lab Building**

The three-story Wet Lab Building contains a mix of faculty offices, research facilities and teaching laboratories. The first floor of the building houses a Physical Assessment Laboratory that utilizes computer technology and other equipment to provide students with "hands-on" training and practice in physical assessment. Other laboratories located on the first floor are an Aerosol Technology Laboratory and an Industrial Pharmacy Laboratory. The second floor houses faculty offices and research laboratories for the Division of Pharmaceutical Sciences, the Pharmacy Dispensing Laboratory and the Duane Reade Integrated Pharmaceutical Care Laboratory. The third floor of the building houses additional offices and laboratories for the Division of Pharmaceutical Sciences and the college's Animal Care Facility.

### **Office of the Dean**

Dr. Stephen M. Gross, Dean  
Anneliese B. Schumacher, Assistant Dean for Administration  
718-488-1004

### **Office of the Associate Dean**

Martin E. Brown, Associate Dean  
Aruna Kissoon, Director, Program Support Services  
718-488-1236

### **Office of the Associate Dean for Professional**

### **Affairs**

Dr. Harold L. Kirschenbaum, Associate Dean for Professional Affairs  
718-488-3371

### **Office of Student and Professional Affairs**

Dr. Lorraine Cicero, Assistant Dean for Academic and Student Affairs  
Dr. Cheryl Evans, Director of Pharmacy Academic Services  
Sheena Loughlin Kelly, Coordinator of Pharmacy Student Counseling  
Lauren Bhogal, Academic Adviser  
Nicole Sanks, Admissions Coordinator  
718-488-1234

The Office of Student and Professional Affairs serves as an advisement and resource center for students enrolled in the professional programs of LIU Pharmacy. The office provides students with academic and personal advisement, registration materials, information on scholastic standing, scholarship applications, applications for intern permits and board examinations, listings of intern positions and other employment opportunities, information on student activities and professional organizations and other services and information of interest to entry-level professional pharmacy students.

Academic and personal advisement is provided by a professional staff knowledgeable of the pharmacy curricula and empathetic to the needs and concerns of professional students. Additionally, the staff assists students with course selection and registration; coordinates open houses for prospective students; facilitates student workshops on study habits and time management; prepares scholarship letters; assists in the review of applicants and coordinates the interview schedule of applicants; and assists in matters of progression and scholastic review of students.

### **Office of Student and Professional Activities**

Patrick J. Campbell, Director  
718-488-1241

The Office of Student and Professional Activities is responsible for coordinating the activities of pharmacy student organizations in association with the Office of the Assistant Dean for Academic and Student Affairs. The office arranges and coordinates informational activities for pharmacy students including Dean's Hours, alumni mentor days, pharmacy residency, fellowship and graduate programs showcases, resume and interview workshops and career fairs as well as coordinating on-campus recruitment of pharmacy students with LIU Brooklyn's Office of Career Services. In addition, the office oversees the LIU Pharmacy Student Leadership Council and yearbook staffs.

### **Office of the Division of Pharmaceutical Sciences**

Dr. Anthony J. Cutie, Division Director

Dr. Rutesh Dave, Ph.D. Assistant Division Director, Ph.D. Program Director (Pharmaceutics), M.S. Program Director (Industrial Pharmacy, Cosmetic Science)

Dr. Kenza Benzeroual, M.S. Program Director (Pharmacology and Toxicology)

Dr. David R. Taft, M.S. Program Director (Drug Regulatory Affairs)

Marianna Azar, Coordinator of Graduate Programs  
718-488-1101

The Division of Pharmaceutical Sciences provides students with requisite instruction and skill development in biological, chemical, physical, mathematical, administrative, social and behavioral sciences, as well as selected areas from the humanities such as law, ethics and communications, and the application of these areas to both the pharmaceutical sciences and the practice of pharmacy. The knowledge imparted to the professional program student covers a broad range of topics such as biochemistry, physiology, pathophysiology, microbiology, immunology, pharmacology, toxicology, medicinal chemistry, pharmaceutics, pharmacokinetics, health delivery and finance, practice management, pharmacoconomics, pharmacy law, patient behavior and professional communications. Additionally, the Division is responsible for the delivery of the College's graduate programs.

### **Office of the Division of Pharmacy Practice**

Dr. Anna I. Nogid, Division Director  
Dr. Jane Shtaynberg, Director of Experiential Education  
Fernando Gonzalez, Field Coordinator of Experiential Education  
Josephine Salcedo, Coordinator of Experiential Education  
718-488-1270

The Division of Pharmacy Practice provides students with the requisite instruction and skill development for engaging in the profession of pharmacy in ways that optimize health outcomes from pharmaceutical and other related treatments and interventions, ensure the effective and safe use of pharmaceuticals and maximize the benefits to both patients and society at large from the use of medications. This is accomplished through both didactic course offerings in areas such as pharmacotherapeutics, physical assessment, drug information and literature evaluation, public health and medication safety, as well as introductory and advanced pharmacy practice experiences offered throughout the professional phase of the Doctor of Pharmacy program.

### **Continuing Professional Education**

Joseph J. Bova, Director  
718-488-1065

LIU Pharmacy's Department of Continuing Professional Education serves pharmacists and pharmacy technicians in advancing their continuing professional development (CPD) by providing live and web-based continuing

professional education (CPE) activities.

The Department affirms the mission of LIU Pharmacy and articulates its own primary mission of providing sufficient, affordable, convenient and high-quality knowledge-based CPE activities to maintain, advance and enhance the competencies and ongoing professional development of pharmacists and pharmacy technicians.

An average of 20 continuing professional education activities are provided each year. Target audiences vary by activity but in most cases activities are structured for pharmacists and/or pharmacy technicians practicing in community-, ambulatory- and/or institutional-based settings that deliver patient-centered care. Many of the activities focus on pharmacotherapy for various disease states and/or special populations such as geriatric or pediatric patients. These activities are designed to advance and enhance the evidence-based practice of participants. Also regularly offered are activities that focus on general practice areas such as pharmacy laws and regulations, patient education and communications, and practice management.

The Department strives to provide a minimum of 3 contact hours of activities on medication errors and patient safety each year for those pharmacists needing to satisfy New York State requirements for continuing professional education.

In-person live CPE activities are available at convenient locations in the New York City metropolitan area. Participation in these live offerings affords valuable networking occasions in addition to advancing CPD. On-demand web-based CPE activities are also available. Featuring a wide range of topics these activities are designed for completion at the learner's own convenience and pacing. Visit the Continuing Professional Education website at [www.liu.edu/pharmce](http://www.liu.edu/pharmce) or call 718-400-1065 for the latest information.

#### **The International Drug Information Center**

Dr. Joseph Nathan, Director

Dr. Sara Grossman, Drug Information Specialist  
718-488-1064

The International Drug Information Center (IDIC) of LIU Pharmacy is well recognized for its long-standing history of providing evidence-based, up-to-date, accurate, and unbiased drug information. Since its inception in 1973, the IDIC has provided information about pharmaceuticals and dietary supplements to a varied client base including pharmacists, physicians, nurses, other healthcare professionals, pharmaceutical companies, attorneys, law enforcement agencies, pharmacy benefit managers, poison control centers, and other institutional and organizational clientele. The IDIC is staffed by drug information specialists who are experienced in retrieving and evaluating medical and pharmacy literature and who hold faculty appointments at LIU Pharmacy.

The IDIC's comprehensive library of resources includes numerous medical and pharmacy journals, specialized texts, commercial electronic

databases, and its own in-house database. These resources, coupled with the expertise and experience of our specialists, allows the Center to fulfill varied requests for drug information. Comprehensive literature searches, medication therapy management (MTM), drug evaluations, and other related projects are available as a special service upon request and through consultation with the IDIC staff.

The IDIC serves as a training site for senior pharmacy students enrolled in a drug information advanced pharmacy practice experience as part of LIU's Doctor of Pharmacy program. Under the supervision and guidance of the IDIC faculty and staff, students participate in researching and responding to questions received by the Center. Verbal and/or written responses (including references, if appropriate) are supplied promptly. A quality assurance program is in place to ensure that answers to questions are of the highest quality.

In addition, the IDIC serves as a resource for the drug information needs of select consumer groups. As a courtesy, the IDIC responds to drug information inquiries received from the LIU community, as well as LIU Pharmacy's affiliated practice sites. Additionally, pharmacies are welcome to subscribe to IDIC's service for a low annual fee. In addition, other organizational subscriptions (e.g., physician groups, clinics) are available. To become a subscriber or request a special project, please contact the IDIC for additional information.

#### **Office of Development and Alumni Relations**

Drew Kaiden, Associate Vice President of Development and Alumni Relations  
718-488-1016

The Alumni Association of LIU Pharmacy is comprised of individuals who have been granted entry-level and/or graduate degrees from LIU Pharmacy or the former Brooklyn College of Pharmacy. The purpose of the Alumni Association is to foster meaningful social and professional relationships among all members of the College family, to further the profession of pharmacy and to develop and advance the interests of LIU Pharmacy.

The staff of the Office of Development and Alumni Relations raises funds for scholarships, programmatic support and capital projects, maintains an up-to-date database of alumni contact information and supports the Alumni Association Board of Directors. The Office of Development and Alumni Relations is also responsible for coordinating alumni events. Alumni Association benefits include the following:

- Assistance with job placement and career development through the office of Career Services, including access to distance counseling, job listings, interview and résumé workshops, and networking programs.
- Membership at the Steinberg Wellness Center for a nominal fee

- Access to campus facilities, including the library and computer labs with alumni ID card
- Invitations to LIU Pharmacy special events
- Alumni e-newsletter, Alumni Anecdotes
- Local and online discounts

The Alumni Association encourages all alumni of LIU Pharmacy to support the Annual Fund, which provides assistance to LIU students in need through vital financial aid programs.

To obtain an alumni identification card or to learn more about the services available to alumni, please contact the Office of Development and Alumni Relations at 718-488-1016 or e-mail [pharmacy.alumni@brooklyn.liu.edu](mailto:pharmacy.alumni@brooklyn.liu.edu).

#### **Computer Laboratory**

Orlando Ross, Coordinator  
718-246-6359

The LIU Pharmacy Computer Laboratory is located on the third floor of the Pharmacy Building. The lab may be reserved for classes, workshops and other academic matters, in addition to being available for use by individual students during unreserved times.

## **LIU Pharmacy Publications**

In addition to LIU Brooklyn's and LIU's diversified publications, LIU Pharmacy offers:

The *Pharmakon*, or Senior Yearbook, a graduation memento published by the Senior Class;

The *Bulletin, for Professional and Graduate Pharmacy Programs*, listing admission requirements, curricula, course descriptions and other information;

LIU Pharmacy also publishes a series of brochures on such matters as continuing education programs and lectures by visiting scientists.

## **Pharmacy Student Clubs and Organizations**

Students of LIU Pharmacy have the opportunity to participate in a wide variety of pharmacy professional organizations. Several of these organizations have student chapters affiliated with LIU Pharmacy. Additionally, students may elect to participate in professional fraternal societies and/or social clubs and organizations. The LIU Brooklyn campus also offers over 50 clubs and organizations for students.

#### **Pharmacy Student Leadership Council**

All full-time students in LIU Pharmacy professional program are represented by the Pharmacy Student Leadership Council. The Council consists of elected representatives from each class and serves to promote the general welfare of the pharmacy student body. All full-time students are permitted to vote in the Pharmacy Student Leadership Council elections and are invited to participate in all activities

sponsored by the Council.

### **Professional Organizations with Local Chapters**

#### *Academy of Student Pharmacists (ASP)*

The Academy of Student Pharmacists is the national professional society of pharmacy students in the United States and an official subdivision of the American Pharmacists Association (APhA). ASP membership is open to any student regularly enrolled in a pre-pharmacy or pharmacy program in an accredited school. ASP chapters provide many professional, educational and social activities for members ([www.aphanet.org](http://www.aphanet.org) or [www.pharmacist.com](http://www.pharmacist.com)).

#### *American Association of Pharmaceutical Sciences (AAPS)*

AAPS is the professional organization to which many of the College's graduate students in the M.S. and Ph.D. programs as well as pharmaceutical sciences faculty belong. ([www.aaps.org](http://www.aaps.org))

#### *American College of Clinical Pharmacy (ACCP)*

ACCP is a professional and scientific society that provides leadership, education, advocacy and resources to enable clinical pharmacists to achieve excellence in practice and research. ACCP's membership is composed of practitioners, scientists, educators, administrators, students, residents, fellows, and others committed to excellence in clinical pharmacy and patient pharmacotherapy. ACCP StuNet is a network that provides student members access to leaders in clinical pharmacy, as well as a chance to explore leadership roles within ACCP ([www.accp.com/stunet](http://www.accp.com/stunet)).

#### *Academy of Managed Care Pharmacy (AMCP)*

AMCP is the national professional association of pharmacists who use the tools and techniques of managed care in the practice of pharmacy. Its goal is to provide the best available pharmaceutical care for patients and to empower its members to serve society by using sound medication management principles and strategies to improve health care for all and to help reduce health-care costs ([www.amcp.org](http://www.amcp.org)).

#### *American Society of Consultant Pharmacists (ASCP)*

ASCP is the national professional association representing pharmacists who provide medication distribution and consultant services to patients in long-term care facilities ([www.ascp.com](http://www.ascp.com)).

#### *American Society of Health-System Pharmacists (ASHP)*

ASHP offers a broad array of services and products to health-system pharmacists, and serves as a national accrediting organization for pharmacy residency and technician training

programs. Any student interested in institutional pharmacy practice should join; benefits include Student Line, a student newsletter, and special programs at ASHP national meetings ([ashp.org](http://ashp.org)).

#### *Indo-American Pharmacists Society (IAPS)*

IAPS was formed by pharmacy students of Indian origin to promote social and professional networking opportunities and is open to all pharmacy students. ([www.iapsrx.org](http://www.iapsrx.org))

#### *Jewish Pharmaceutical Society (JPS)*

JPS was an organization originally formed in the 1950s at the Brooklyn College of Pharmacy that has been recently revived by students interested in promoting the profession among Jewish pharmacy students. Their events and guest speakers focus their attention on the intersection of their faith and their profession.

#### *National Community Pharmacists Association (NCPA)*

NCPA was founded in 1898 as the National Association of Retail Druggists (NARD); it represents the pharmacist owners, managers and employees of nearly 25,000 independent community pharmacists across the United States. Independent pharmacists – more than 60,000 nationwide – dispense the majority of the nation's retail prescription drugs. The College of Pharmacy opened a student chapter in 2004. The student chapter offers students a wide array of opportunities to broaden and enrich their educational experience and gain valuable, real-world skills ([www.ncpanet.org](http://www.ncpanet.org)).

#### *New Jersey Pharmacists Association (NJPhA)*

NJPhA was founded in 1870 to represent pharmacists in the State of New Jersey who practice in all areas of pharmacy. The student chapter was formed to promote networking opportunities for students who plan to practice in New Jersey. ([www.njpharmacist.org](http://www.njpharmacist.org))

#### *Student National Pharmaceutical Association (SNPhA)*

SNPhA (the student group of the National Pharmaceutical Association) is a group of pharmacy students whose purpose is to plan, organize and coordinate programs geared toward the improvement of health education and the social environment of minority communities ([www.snpha.org](http://www.snpha.org)).

#### *Student for Growing Interest for Transplantation (S4GIFT)*

S4GIFT is a recently formed chapter of a national organization interested in educating and training other of health professional students on organ and cell donation and transplantation. ([www.s4gift.org](http://www.s4gift.org))

#### *Pharmaceutical Industry Student Association (PISA)*

PISA is a group formed and led by Pharmacy students so that they can better understand the career opportunities open to them in the pharmaceutical industry. The group invites industry professionals, many of whom are alumni, to talk about their career paths and how to be successful in their areas of practice. PISA members also collect information on related internships as well as the skills, education and experience that will be helpful in starting a career in the pharmaceutical industry. In addition, the members work together to explore the different areas of pharmacy within industries where pharmacy students and pharmacists have opportunities for work.

### **Professional Fraternal Societies**

#### *Lambda Kappa Sigma (LKS)- Alpha Eta Chapter*

*Lambda Kappa Sigma* is the only international, professional fraternity for women enrolled in pharmacy. It seeks motivated female students to join its ranks, and encourages the development of its members both culturally and intellectually. LKS provides both professional and social functions throughout the academic year ([www.lks.org](http://www.lks.org)).

#### *Phi Delta Chi-Beta Theta Chapter*

The objective of this association is to advance the science of pharmacy and its allied interests and to foster and promote a fraternal spirit among its members ([www.phidelta.org](http://www.phidelta.org)).

### **Honorary Societies**

#### *Rho Chi Society - Beta Theta Chapter*

*Rho Chi* is the national pharmacy honor society which stimulates and recognizes superior scholarly achievement. Entry-level students in the upper 20% of their class who have a cumulative index of 3.50 or better are eligible for membership during their fourth year. Graduate students are eligible if they have completed at least 24 credits with a 3.50 grade-point average in addition to other requirements ([www.rhochi.org](http://www.rhochi.org)).

#### *Phi Lambda Sigma - Beta Kappa Chapter*

*Phi Lambda Sigma* is the national pharmacy leadership society which promotes the development of leadership qualities among pharmacy students. To be eligible for membership, the student must be of high moral and ethical character, must have completed 96 credits of scholastic work applicable for the pharmacy degree, and have a grade-point average of at least 2.50. Prospective members are nominated on the basis of their demonstration of dedication, service and leadership in the advancement of pharmacy. Members are selected by peer recognition ([www.philambdasigma.org](http://www.philambdasigma.org)).

## About LIU Brooklyn

### Statement of Mission

Expressed in its still-relevant motto *Urbi et Orbi*, the mission of LIU since 1926 has been to open the doors of the city and the world to men and women of all ethnic and socioeconomic backgrounds who wish to achieve the satisfaction of the educated life and to serve the public good. Its mission is to awaken, enlighten and expand the minds of its students.

Generation after generation, the students who have enrolled at LIU Brooklyn have come from varied, primarily urban backgrounds. Like their predecessors, many of today's students are new to America and new to the English language or are the first in their families to seek a university education. At LIU Brooklyn, all students find an academic community where cultural, ethnic, religious, racial, sexual, and individual differences are respected and where commonalities are affirmed. This requires the Campus to be open and welcoming, even as it maintains respect for intellectual, cultural and academic traditions.

Nationally recruited, the faculty has a strong commitment to teaching, to personal advisement of students, to the fullest range of scholarship, and to faculty development and service.

LIU Brooklyn recognizes both the faculty's training and experience and the character of its diverse student body as two of its greatest strengths and challenges. No matter what their background or generation, students come to LIU Brooklyn to build the educational and intellectual foundations for successful personal lives and careers. The Campus faculty and administration believe that a liberal education, along with careful preparation for a fulfilling career, is the best way to achieve this end.

To carry out its mission, LIU Brooklyn offers comprehensive undergraduate curricula, supported by advanced courses for specialized knowledge and graduate programs in those areas in which it has developed strength or has a unique contribution to make. In addition, the Campus has designed programs to permit students to acquire essential literacies, intellectual curiosity, analytic and reasoning skills, and effective communication skills. In this way, the Campus serves as a conservator of knowledge, a source and promulgator of new knowledge, and a resource for the community it serves.

### Undergraduate and Graduate Offerings

**Richard L. Conolly College** offers liberal arts and sciences programs leading to the degrees of Associate in Arts, Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Science, Master of Arts, Master of Fine Arts, Master of Science, and Doctor of Philosophy (in Clinical Psychology). It also offers a B.S./M.S. in Communication Sciences and Disorders/ Speech-Language Pathology, and a United Nations Graduate Certificate Program.

The **School of Business, Public Administration and Information Sciences** offers, on the undergraduate level, the degrees of Associate in Applied Science in Business Administration; Bachelor of Science in Accounting, Computer Science, Technology Management, Entrepreneurship, Finance, Management, and Marketing. On the graduate level, the School offers the Bachelor of Science/Master of Science in Accounting; Master of Business Administration (M.B.A.); Master of Business Administration in Accounting (M.B.A. Accounting); Master of Science in Accounting, Computer Science, Human Resource Management, Taxation, Master of Public Administration (M.P.A.) and M.P.A. in Health Administration. It also offers Advanced Certificates in Human Resource Management, Gerontology Administration and Not-for-Profit Management.

The **School of Education** offers, on the undergraduate level, the Bachelor of Science and the Bachelor of Fine Arts degrees in various disciplines in urban education. On the graduate level, the school offers the Master of Science in Education degree in the areas of Childhood Urban Education, Early Childhood Urban Education, Adolescence Urban Education, Teaching Urban Children with Disabilities, Teaching Urban Adolescents with Disabilities, Teaching English to Speakers of Other Languages (TESOL), School Counseling, Bilingual School Counseling and School Psychologist; the Master of Science degree in Mental Health Counseling and Marriage and Family Therapy; and Advanced Certificates in Bilingual Education, Educational Leadership, Early Childhood Urban Education, School Counseling, Bilingual School Counseling, Mental Health Counseling, and Marriage and Family Therapy.

The **School of Health Professions** offers the Bachelor of Science degrees in Health Science, Diagnostic Medical Sonography, Respiratory Care and Sports Sciences, and the Bachelor of Arts degree in Social Work. It also offers combined B.S./M.S. degrees in Athletic Training and in Occupational Therapy and the B.S./M.P.H. in Health Science / Master of Public Health. It offers the M.S. degrees in Exercise Science, and in Physician Assistant Studies as well as the Master of Social Work and the Master of Public Health. The Division of Physical Therapy offers a Doctor

of Physical Therapy (D.P.T.) program that is a three-year post-baccalaureate graduate degree. An accelerated 3+3 B.S./D.P.T. in Health Science / Doctor of Physical Therapy is also offered.

The **School of Nursing** offers the Bachelor of Science with a major in Nursing for generic, R.N.-B.S. and 2nd degree students, the Master of Science in Adult Nurse Practitioner and Family Nurse Practitioner, Health Care Management, and Nurse Educator. The following Advanced Certificates are offered: Adult Nurse Practitioner, Family Nurse Practitioner, and Education for Nurses. The School of Nursing offers an accelerated R.N.-B.S./M.S. Adult Nurse Practitioner dual degree program.

The **LIU Pharmacy – Arnold & Marie Schwartz College of Pharmacy and Health Sciences** offers an entry-level, six-year Doctor of Pharmacy (Pharm.D.) degree and the Master of Science degree in Pharmaceutics, Drug Regulatory Affairs and Pharmacology/Toxicology. It also offers the Doctor of Philosophy in Pharmaceutics (Ph.D.) degree.

**LIU Global** is designed for students who desire a hands-on learning approach in a variety of international locations. The college offers a Bachelor of Arts in Global Studies.

**DIRECTORY**

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**LIU PHARMACY GENERAL INFORMATION:**

718-488-1234

**LIU PHARMACY ADMINISTRATION**

DEAN—Stephen M. Gross, B.S., M.A., Ed.D.

Rm. L108; 718-488-1004

ASSOCIATE DEAN—Martin E. Brown, B.S., M.S.

Rm. L130; 718-488-1236

ASSOCIATE DEAN FOR PROFESSIONAL AFFAIRS—

Harold L. Kirschenbaum, B.S., M.S., Pharm.D.

Rm. L207; 718-488-3371

ASSISTANT DEAN FOR ACADEMIC AND STUDENT AFFAIRS—

Lorraine A. Cicero, B.S., M.S., Pharm.D.

Rm. L130E; 718-488-1237

ASSISTANT DEAN FOR ADMINISTRATION—

Anneliese B. Schumacher, B.A., M.A.

Rm. L108; 718-488-1228

DIRECTOR, CONTINUING PROFESSIONAL EDUCATION—

Joseph J. Bova, B.S.

Rm. L207; 718-488-1065

DIRECTOR, PHARMACY ACADEMIC AFFAIRS—

Cheryl Evans, B.A., M.S., Ed.D.

Rm. L130; 718-488-1238

DIRECTOR, STUDENT AND PROFESSIONAL ACTIVITIES—

Patrick J. Campbell, B.A., M.A.

Rm. L123; 718-488-1241

ASSOCIATE VICE PRESIDENT ALUMNI AND DEVELOPMENT—

Drew Kaiden, B.A.,

Rm. L208; 718-488-1249

DIRECTOR, PROGRAM SUPPORT SERVICES—

Aruna Kissoon, B.A., M.S.

Rm. L130A; 718-780-4560

DIRECTOR, EXPERIENTIAL EDUCATION—

Jane Shtaynberg, Ph.D.

Rm. HS504; 718-488-3469

COORDINATOR, ADMISSIONS—Nicole Sanks, B.A.

M412; 718-488-1238

COORDINATOR OF EXPERIENTIAL EDUCATION—

Josephine Salcedo, B.A., M.B.A.

Rm. HS505; 718-488-3455

COORDINATOR OF PHARMACY STUDENT COUNSELING—

Sheena Loughlin Kelly, B.A., M.A.

Rm. L130B; 718-488-1235

PHARMACY ACADEMIC ADVISOR—

Lauren N. Bhogall, B.A., M.S.

Rm. L130C; 718-488-1693

SPECIAL ADVISOR TO THE PRESIDENT FOR PHARMACY—

Stephen M. Gross, B.S., M.A., Ed.D.

Rm. L136; 718-488-1227

COORDINATOR OF GRADUATE PROGRAMS

Marianna Azar, B.A., M.A.

Rm. L124; 718-488-1062

COORDINATOR, STUDENT COMPUTER LAB—

Orlando Ross

Rm. L303; 718-246-6359

FIELD COORDINATOR OF EXPERIENTIAL EDUCATION—

Fernando Gonzalez, B.S.

Rm. WL213; 718-488-1636

**LIU BROOKLYN GENERAL INFORMATION:**

718-488-1000

**ADMISSIONS**

S Building, 1st Floor; 718-488-1011

**PUBLIC SAFETY**

Rear, Metcalfe Building; 718-488-1078

**OFFICE OF INSTITUTIONAL ADVANCEMENT AND STUDENT AFFAIRS**

Rm. 412; 718-488-1602

**INTEGRATED STUDENT FINANCIAL SERVICES**

S Building, 3rd Floor; 718-488-1037

**UNIVERSITY HEALTH AND MEDICAL SERVICES**

University Towers, Ground Floor; 718-246-6450

**INFORMATION TECHNOLOGY**

Rm. LLC234; 718-488-1082

**INTERNATIONAL STUDENTS**

Rm. M311; 718-488-1389

**REGISTRAR**

S Building, 1st Floor; 718-488-1013

**RESIDENCE LIFE AND HOUSING**

Richard Conolly Residence Hall; 718-488-1046

**SPECIAL EDUCATIONAL SERVICES, ACHIEVEMENT STUDIES AND RENAISSANCE SERVICES**

Rm. L Basement; 718-488-1044

**STUDENT LIFE AND LEADERSHIP DEVELOPMENT**

Rm. M311; 718-488-1216

## ACADEMIC CALENDAR 2013-2014

## Fall 2013

August 19 - August 30	In-Person Registration
September 2	Labor Day-holiday
September 3	Convocation Day
September 4	Weekday classes begin
September 4-10	Late registration and program changes
September 7-8	Semester classes meeting Saturday-Sunday begin
September 7-8	First weekend session classes begin
September 10	Late registration ends
September 20	Awarding of September degrees
September 30	Deferred final examinations
October 4	Last day to apply for January degree
October 4	Last day to apply for comprehensive examination
October 14-25	Midterm examinations-classes in session
October 19-20	First weekend session final examinations
October 26-27	Second weekend session classes begin
October 30	Last day to withdraw from undergraduate courses
November 5	Election Day-classes in session
November 27	Wednesday follows a Friday schedule
November 28	Fall recess begins
November 30	Classes resume
December 4	Last day to submit thesis and complete degree requirements
December 7-8	Second weekend session final examinations
December 7-8	Semester classes meeting Saturday-Sunday end
December 12	Semester classes meeting Monday through Friday end
December 12	Last day to withdraw from graduate courses
December 12	Last day to complete withdrawal appeal process
December 13	Study day
December 14-20	Final examinations-undergraduate and graduate
December 21	Winter recess begins

## Spring 2014

January 7-17 and January 20	In-Person Registration
January 20	Martin Luther King, Jr. Day
January 21	Weekday classes begin
January 17	Awarding of January degrees
January 21-24 and January 27	Late registration and program changes
January 25-26	Semester classes meeting Saturday-Sunday begin
January 25-26	First weekend session classes begin
January 27	Late registration ends
January 27	Deferred final examinations
January 31	Last day to apply for May degree
January 31	Last day to apply for comprehensive examination
February 17	President's Day-no classes
February 18	Tuesday follows a Monday Schedule
February 24-March 7	Midterm examinations-classes in session
March 8-9	First weekend session final examinations
March 10	Spring recess begins
March 17	Classes resume
March 19	Last day to withdraw from undergraduate courses
March 22-23	Second weekend session classes begin
April 4	Last day to submit thesis and complete degree requirements
May 3-4	Second weekend session final examinations
May 3-4	Semester classes meeting Saturday-Sunday end
May 6	Semester classes meeting Monday through Friday end
May 6	Last day to withdraw from graduate courses
May 7-13	Final examinations-undergraduate and graduate
May 7	Last day to complete withdrawal appeal process
May 15	Commencement Ceremony
May 16	Conferral of May degrees

**Summer I 2014**

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May 15-16	Registration and program changes
May 17-18	Weekend session classes begin
May 19	Weekday classes begin
May 20	Late registration ends
May 24-26	Memorial Day-holiday
May 27	Last day to withdraw from undergraduate courses
June 2	Deferred final examinations
June 4	Last day to apply for September degree
June 4	Last day to apply for comprehensive examination
June 28-29	Weekend session final examinations
June 30	Last day of class
June 30	Last day to withdraw from graduate courses
June 30	Last day to complete withdrawal appeal process
Last Class Meeting	Final examinations

**Summer II 2014**

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July 2-3	Registration and program changes
July 4	Independence Day - holiday
July 7	Weekday classes begin
July 8	Late registration ends
July 12-13	Weekend session classes begin
July 16	Last day to withdraw from undergraduate courses
August 14	Last weekday class
August 14	Last day to submit thesis and complete degree requirements
August 14	Last day to withdraw from graduate courses
August 14	Last day to complete withdrawal appeal process
August 16-17	Weekend session final examinations
Last Class Meeting	Final examinations

## CAMPUS SERVICES, FACILITIES & RESOURCES

This section provides brief descriptions of facilities and resources that are available at LIU Brooklyn. It is not intended to be comprehensive but rather is presented as a selection of those facilities and resources that may be of particular interest to students of LIU Pharmacy.

### The Library

Ingrid Wang, Associate Professor, Director;  
Telephone: 718-488-1680  
Fax: 718-780-4057

The LIU Brooklyn Library houses a rich collection of books, periodicals, microforms, audio and videotapes, CDs and DVDs, pamphlets, and other materials in support of the Campus' educational programs. Online databases, both bibliographic and full text, are available for searching multidisciplinary and specific subject areas. Remote access from off-campus is available; the databases and library catalog may be accessed through the University website at [www.liu.edu/brooklyn/library](http://www.liu.edu/brooklyn/library).

The reference collection, reference desk, paralegal collection and Technical Services departments are situated on the third floor of the Salena Library Learning Center. An information commons, consisting of clusters of computers, provides access to the databases, library catalog, and the Internet, all within a few steps of the reference librarians. These computers, as well as all other computers in the library, are also equipped with productivity software such as word processing, spreadsheet, and presentation programs.

The Periodicals department, with a collection of both print and microforms titles, is located on the fourth floor, where digital microform reader/printers are available. The InterLibrary Loan, Special Collections, Rare Book Room, and Library Information Technology are also located on the fourth floor.

The circulation desk, reserve collection, and the main book stacks are located on the fifth floor. The Media Center, housing the multimedia collection, media equipment and a group viewing room, is also on the fifth floor, as is the Library's Cyber Lab. The Cyber Lab is equipped with computers that provide access to databases, library catalog, and Internet as well as up-to-date word processing, spreadsheet, presentation and database programs. In addition, the Library's "smart classrooms" are located on the fifth floor. Photocopying machines are available on all three floors of the Library.

Research materials not in the collection of the LIU libraries are provided from other libraries in Brooklyn as well as the larger metropolitan area. Interlibrary loan services are available to locate materials throughout New York State and nationwide. The Library is a member of several

consortia, which grant both reading and borrowing privileges to LIU students.

The Library is linked electronically to the libraries at other LIU campuses, and shares one catalog – LIUCAT. This resource provides information on all of the more than 2.6 million items held by the University. In addition to print materials, the Library has a large collection of electronic books, e-encyclopedias and full text journals, available 24/7 to all library users. The Library offers Information Literacy classes and curriculum-integrated instruction. Library faculty and staff are available to help faculty and students with reference questions and research strategies.

### Department of Information Technology

**Mr. George Baroudi**, Vice President for  
Information Technology

**Dr. Kamel Lecheheb**, Deputy CIO  
718-488-1082  
<http://it.liu.edu>

**Information Technology** supports all University systems, including Online Student Applications, PeopleSoft Student portals for Admissions, Integrated Student Financial Services, Registrar, Student Online and Faculty Grading Portals, Human Resources, Benefits and Payroll System, the Enrollment Dashboard System, the ID card System, Audio Visual Services, and the Residential Housing System (RMS). It also provides business process analysis of all administrative units. IT maintains 22,000 internet-capable devices and 850 analog/digital telephones and 750 Cisco IP phones at the LIU Brooklyn network. That includes fiber optic and copper infrastructure throughout the buildings, firewall and security access, and wireless internet access. It provides off-site facilities support to Hanover, Hoyt and Fulton Street residence halls, Health Center, the Steiner Studios at the Navy Yard (Screen Writers Program), Westchester and Rockland campuses. IT also maintains the campus' security camera systems, electronic door locks to all Dorms and most classrooms, cafeteria cash registers, the Kronos Timekeeper for the facilities staff, campus videoconferencing and campus plasma displays, electronic and web signage.

**IT Website:** <http://it.liu.edu>

**IT Help Desk:** <http://it.liu.edu/servicedesk>

**Phone:** 718-488-3300

Email inquiries sent to [it@liu.edu](mailto:it@liu.edu) or [bkln-it@liu.edu](mailto:bkln-it@liu.edu) are received by all IT staff to ensure quicker response time.

**Walk-ins:** Room LLC 227

### My LIU

My LIU is the University's portal which provides students with convenient access to information about their records. By logging onto

<https://my.liu.edu>, students may view the schedule of classes, register for courses, obtain their grades, and requests transcripts. They may also view financial aid awards, billing information, make online payments, accept and decline Federal Loans and Federal College Work Study, and make an appointment to see counselors. For more information, please visit or contact CSI.

### Residence Life and Housing

Jordan C. Ross, Interim Director  
718-780-6570  
email: [Jordan.Ross@liu.edu](mailto:Jordan.Ross@liu.edu)

The Office of Residence Life & Housing is committed to working with students in order to create an environment that supports and compliments the academic mission of the University through community development, student-centered programs, and campus engagement. Residents reside in one of our three residential halls. Richard L. Conolly Hall is a 16-story building of standard, suite, and apartment spaces for freshmen, sophomore, and junior class residents. All Conolly students residing in standard and suites rooms are required to take the compulsory Carte Blanche meal plan. Seniors live in the Hoyt Street Residence Hall. The Hoyt Street Residence Hall has suites and apartment spaces. Fall 2011, graduate students will reside in our new three floor all-apartment residence hall. All residence areas offer free wireless and cable, study lounges, recreation rooms, TV lounges, laundry rooms, 24 hours/day security officers, and dedicated professional and paraprofessional staff. All residential spaces come with an extra-long twin sized bed, desk, desk chair, dresser, micro-fridge, wardrobe unit/closet, AC, and personal digital safe.

### University Health & Medical Services

Ralphnie Edmond, Director  
University Health & Medical Services  
718-246-6455  
VR Small, Director, Student Support Services  
175 Willoughby Street (entrance on Fleet Place)  
Brooklyn, NY 11201  
Office: 718-246-6456  
Fax: 718-246-6465

Welcome to University Health and Medical Services (UHMS) your primary resource for healthy living during your college tour. Regardless of your financial situation, we are available to assist you in addressing your health and medical needs. Our mission and motto is "Keeping you well, so you can excel!"

Our strategy of good health begin with our new partnership with The Brooklyn Hospital Center (TBHC), through which we are able to provides an extensive list of valuable services, conveniently located in University Towers, 175 Willoughby

Street, Ground Floor (enter on Fleet Place), available from 9 am-5 pm, Monday – Friday. We welcome appointments and walk-ins and offer quick and easy referrals to specialists. In addition, funds are never collected on site and most of our cost-effective services are covered by your student insurance policy.

This one-stop model places preventive services and emergency care at your fingertips, with the quality of care you desire and deserve. We are continually upgrading and applying the best practices to maintain a friendly, safe, and professional environment ready to meet your health and medical needs. To this end, we recently negotiated a one-price clinical package for new and returning students, which cover all clinical requirements. Make your clinical preparation a smooth and simple process via UHMS.

We are proud of the cultural diversity of our students, which also reflects varying health practices. To this end, your safety is our primary concern, and to ensure the overall health of each student, NYS Public Health Laws, 2165 (MMR Requirements) and 2167 (Meningococcal Meningitis) are strictly enforced. We value your enrollment at LIU Brooklyn and are here to aid you in meeting these requirements. For information about the required policies and procedures, you have four easy options for assistance. At your leisure, 24/7 review our compliance webpage [www.liu.edu/brooklyn/uhms/compliance](http://www.liu.edu/brooklyn/uhms/compliance); forward an email to [bkln-uhms@liu.edu](mailto:bkln-uhms@liu.edu); speak with a representative at 718-246-6450 or visit our site for a one-on-one experience.

Our goal is to C.H.A.T (Compliance, Health Information, Access to Services and Talent Opportunities) with you daily about available health and wellness programs/services. Like us on Facebook, follow us on twitter and review our blogs around hot health topics. Make the most of all that UHMS has to offer by utilizing our online Resource & Survey Center for up-to-date health and wellness information or get involved with one of our community collaborations, attend an annual health observance or find out how to access free services. Everything we do is aimed at keeping you well so you can excel.

Interested in gaining experience in the health industry, join our extensive team of student workers assigned from work-study, student activities and those participating in our nonpaid student internship. Join the team at UHMS and develop strong viable industry skills in health and medical services while earning your degree.

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### Psychological Services Center

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Seymour Pardo, Director  
718-488-1266

At our Psychological Services Center, free and confidential personal counseling is offered to students by supervised doctoral candidates in Clinical Psychology. Students experiencing stress

in relation to academic, social or family situations or students who simply feel they are not living up to their full potential for various reasons may benefit from speaking to someone at the Center. Whether stress is interfering with a student's ability to do his/her best at school or is affecting the student's family or social life, talking can help. Except in the rare case of danger to self or other, no one in or outside the university knows who comes to the Center.

The Psychological Services Center is located on the third floor of the Pharmacy Building, right around the corner from the library, in Room L-36 and is open on Mondays and Thursdays 9 a.m. to 4 p.m., Tuesdays 11 a.m. to 4 p.m., and Fridays 10 a.m. to 3 p.m. Students can call to make an appointment or just stop by.

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### Academic Reinforcement Center

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Courtney Frederick, Director  
718-488-1040

Location: Pratt, Suite 110  
Hours: Monday – Thursday, 9 a.m. - 8 p.m.  
Friday, 9 a.m. - 5 p.m.

Online Tutoring Available, various hours 7 days a week, through Blackboard.

The Academic Reinforcement Center (ARC), centrally located in the Pratt Building, Suite 110, is a learning center that offers quality one-on-one and small-group tutoring across the disciplines to undergraduates of LIU Brooklyn. We provide assistance in mathematics, business, languages, and the humanities, as well as the social, physical and health sciences. Tutoring sessions are designed to supplement in-class work and focus on providing opportunities for active learning, self-reflection, and collaborative study. Tutors, acting as educational mentors rather than instructors, focus not on teaching content and completing homework assignments, but on posing problems and putting course subjects into practice through critical thinking and re-examination. We want to help you become a better learner. We offer weekly one-on-one or small-group sessions, walk-in tutoring sessions, online tutoring, targeted group workshops, study skills support, mid-term & final exam review sessions, and assistance with forming study groups.

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### Testing Center

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Andres Marulanda, Director  
718-488-1392

Location: Pratt, Suite 110  
Hours: Monday – Thursday, 9 a.m. - 6 p.m.  
Friday, 9 a.m. - 5 p.m.

The Testing Center is committed to provide a nurturing, informative environment for students taking the LIU Brooklyn Placement Examination or other examinations deemed necessary by the University community. The placement examination is administered on campus or electronically through the Online Writing

Assessment. Our Center supports student success by ensuring that entering students are placed in appropriate English and Mathematics courses. Other examinations administered by the Center include retests and exemption exams such as the Math 10 and language exams, Ability-to-Benefit exams required for some students for financial aid and exams to fulfill the core curriculum Computer Literacy graduation requirement. Support and appropriate arrangements are available for out-of-state students or applicants with qualifying disabilities.

The Testing Center works collaboratively with the campus community and supports academic departments by providing testing and proctoring services. The office administers the Teaching and Learning Assessment, the HESI A2 Nursing exam, diagnostic tests including the ASSET and Accuplacer exams, and other professional and certification examinations including the CST, CPT, and CSCS, among others.

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### Modern Language Center

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Stanley J. Zelinski, III, Associate Dean, Director  
Beth D. Meetsma, Assistant Director  
718-488-1323

The Modern Language Center offers both intensive and non-intensive English language programs for international students, immigrants and refugees who wish to improve their language skills. Classes are given mornings and evenings, Monday-Thursday, throughout the year; F-1 (student) visas and financial aid are available for qualified students. The Modern Language Center is located on the first floor of the Pratt Building, room 122.

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### International Students' Services

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Steve A. Chin, Director  
Francesca Freeman-Lujan, Assistant Director  
Phone: 718-488-1216  
Fax: 718-780-4182  
E-mail: [steve.chin@liu.edu](mailto:steve.chin@liu.edu)  
[francesca.freeman@liu.edu](mailto:francesca.freeman@liu.edu)

The Office of International Students provides special services to students from abroad and responds to their unique needs and problems. It gives information and sees to it that the resources available on campus are being used. It also guides and helps students with immigration and personal matters. All international students are required to contact the Office of International Students as soon as possible after registration. Special orientation programs are given during the Fall and Spring semesters. The office is a source of reference for international students on F-1, M-1 and J-1 visas.

## Office of Institutional Advancement & Student Affairs

Kim Williams Clark, Esq.  
Dean of Institutional Advancement & Student  
Affairs (IASA)  
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Our mission is to create a world-class student centered environment where individuals of all socio-economic backgrounds, diverse ethnicities and gender groups can thrive and develop socially, academically and professionally in their communities and abroad. To this end, the office collaborates with University Center officials as well as LIU Brooklyn faculty and administrators to attract funding and resources to the campus, help enhance its public image, and facilitate opportunities for developing new programs, services and partnerships for the students it serves.

IASA also oversees all aspects of student affairs activities and direct services to students. It develops partnerships and initiatives that support the education of students and advance the university role as a community resource. It is available to assist faculty and staff with program and grant development, including program/funding source matching, technology based funding searches and capacity building. The main office is located in room M-412.

## Student Life and Leadership Development

Karlene Thompson, Director  
M-311, 718-488-1216

LIU Brooklyn, under the guidance of the director of Student Life and Leadership Development, Karlene Jackson Thompson, facilitates the development of students, and hones their personal and organizational leadership skills by providing opportunities for participation in co-curricular, cultural, social, civic, community and wellness programs. The core values of Student Life are Leadership, Integrity, Service, Community, Diversity, Learning, and School Spirit, and we carry out our mission primarily through our oversight of clubs and organizations, leadership training programs, evening programs, civic and community programs and a grant program.

### Student Organizations

We guide and assist 30 academic student organizations, 22 social organizations 19 cultural organizations, 6 religious organizations, 11 honor societies, and 11 Greek organizations with the planning, organizing and implementing of each group's goals and events. In addition, we oversee the student media coalition which is comprised of:

WLIU Radio, a state-of-the-art radio station, WLIU DJ Mobile Unit, Seawanhaka Newspaper, Sound Yearbook, and LIU Television.

### Leadership Training

Student Life provides yearly leadership training for all students involved in student organizations at our summer Leadership Retreat with our sister campus, LIU Post, as well as workshops for secretaries and treasurers. In addition, we have a Student Leadership Academy which is primarily designed to train students to be leaders on campus. Both trainings are augmented by other stand alone trainings, workshops or webinars on specific issues like goal-setting, time management, diversity, friendship and self-esteem, and alcohol awareness, for example. In addition the Avena Lounge, which we oversee, provides Business Management training each semester to employees of the lounge.

### Avena Lounge

The Avena Lounge is a student area complete with opportunities for building Business Management and event planning skills. The lounge has a game room, kitchen for special events, and a wine and beer bar which operates in the evenings from Mondays through Thursdays. Employment opportunities in the lounge also affords students the ability to hone their leadership skills while receiving payment.

### Evening Recreation Program

Our dynamic evening recreation program is multi-faceted ranging from basketball, tennis and African/Caribbean Dance to board games, table tennis and X-Box game tournaments. The program also sponsors trips to Rangers and Devils Hockey, Knicks and Nets Basketball, Mets and Yankees Baseball, Jets and Giants Football and bowling.

### Civic and Community Program

Student Life co-hosts at least two workshops per year on the American Electoral process and the importance of being registered to vote and being informed about political issues in general. The office registers approximately 400 students per year in our various voter registration drives. In addition, we accommodate students who go to Albany to lobby for student financial aid and other issues pertinent to them.

Additionally, the office sponsors a One Good Deed program which involves a myriad of community service projects that include fundraising for various benefits such as Haitian earthquake relief etc., an alternative Spring Break trip, several blood drives throughout the year, clothing and book drives, holiday celebrations for children in the community and several others.

### Grants and Funding

The Office administers the Campus Activity Program Grant, a \$2500.00 award given to students who are members of the Campus Activities Program and who engage in leadership training, specific co-curricular activities and on-campus job assignments. The Office also offers graduate assistantships to Graduate students

interested in student leadership training, event planning, graphic design, business management and Accounting, Media, and Evening Program Management. Also, students who are the executive members of SGA, Seawanhaka, Sound, WLIU Radio and LIU-TV are awarded a percentage of tuition remission which is administered through Student Life.

Entering freshmen and all students in good academic standing are eligible to take part in the extra curricular activities program. Activities as well as academics provide a balanced education and are therefore encouraged. Programs offered through the Office of Student Activities are funded by the proceeds of the Student Activity fee. The distribution of the Student Activity Fee promotes a progressive and student-centered program.

Applications for the Student Leadership Academy, the Campus Activities Program Grant, and the Student Life Graduate Assistantship are available online at the Student Life page of [www.liu.edu](http://www.liu.edu), as well as in the Student Life office in M-311.

### Student Government Association

All enrolled students are members of the Student Government Association (SGA). The executive officers of the SGA, along with the elected representatives from each class, constitute the Student Council. Some of the Council's many duties include allocating of funds to all campus clubs; approving the formation of new organizations; and sponsoring extracurricular programs of intellectual, cultural and social appeal for the student body. In addition to its administrative functions, the Council acts as a liaison between the student body and the faculty and administration. Participation Eligibility: All students, including entering freshmen, in good academic standing and not on probation (academic or disciplinary) are eligible to take part in the extracurricular activities program. Intelligently selected activities that round out a liberally based education are encouraged.

## University Honors Program

James Clarke, Ph.D., Co-Director;  
Cris Gleicher, Co-Director;  
718-780-4023; Fax: 718-780-4061  
Email: bkln-honors-staff@liu.edu

The University Honors Program is a nationally recognized liberal arts program for undergraduate students in all disciplines at LIU Brooklyn. It is designed to assist students to become critical and independent thinkers. That goal is accomplished through an enriched core curriculum in small, seminar-style liberal arts classes that stress student participation and independent learning. The Honors Program also gives students freedom to design their own majors (see Contract Major below). Within the University, the Honors Program develops an active community of learners, providing opportunities for intellectual support, social interaction, and leadership development.

The University Honors Program is active in national organizations representing Honors students and undergraduate research. University Honors students are encouraged to shape their own education in a variety of ways. They may do so by taking a broad range of courses outside their areas of concentration, by attending national and regional conferences involving undergraduate research, and by participating in national and international Honors Semesters sponsored by the National Collegiate Honors Council.

Application to the Program is separate from that of the university. Interested students should apply directly to the Program. Applications can be obtained online ([www.liu.edu/brooklyn/honors](http://www.liu.edu/brooklyn/honors)) or by contacting the Program advisers.

### University Honors Requirements

Freshmen typically take a sequence of literature, history, and philosophy courses organized around a central theme. Completion of this sequence satisfies all WAC requirements outside the major. Honors also offers courses that enable students to complete their social science, fine arts, speech and foreign language requirements in an Honors environment. At the upper-level, Honors offers advanced liberal arts electives representing a range of themes taught by faculty from all departments at the university, including the sciences, humanities, the arts, journalism, and the social sciences. The advanced electives utilize field experience, independent research, and the extraordinary resources of New York City to provide students with a unique learning experience. Topics vary each semester—current and recent offerings can be viewed on the Honors website.

In order to graduate with Honors, students must be in good standing with the Program and must complete the Honors Freshman sequence, other Honors equivalents for core courses, and at least three Honors Advanced Electives. Transfer students who have already satisfied their core

liberal arts requirements may graduate with Honors by completing four Honors Advanced Electives. Students must also achieve a cumulative grade point average of 3.0 or higher by the time of graduation.

### Program Model

Honors requires students to take the humanities and social science core courses in their major for which there is an Honors equivalent offered by the program. Beyond the core requirements, Honors students must take three Honors Advanced Electives (9 credits) or, for students transferring into Honors who have already completed the non-Honors core, four Honors Advanced Electives (12 credits). All Honors requirements are built into the requirements of any given major; Honors does not require that students take additional credits to graduate.

### Contract Major

If a major is not offered by the University, an Honors student may design his/her own major in consultation with his/her Honors adviser and the appropriate faculty. Students interested in a contract major must be in good standing with the Program and will need the permission of the Honors Director and the approval of the appropriate faculty and the relevant Dean. Applications will not be accepted until students have completed at least 32 credits. Interested students should contact their Honors adviser immediately. Contract majors in the past have included degrees in Bio-psychology, International Relations, and Public Relations.

### Honors Independent Study

University Honors students in good standing may register for independent study. Prior agreement from a faculty mentor and approval of the Honors Director and the Dean of Richard L. Conolly College are required. Independent study may satisfy up to six credits of Honors Advanced Elective requirements.

### Distinction in Honors

Any final project for an Honors Advanced Elective may be expanded, under the guidance of a faculty mentor, into a substantial paper. Review of the paper by the faculty mentor and presentation at a year-end Honors symposium are required to achieve Distinction in Honors at graduation. Interested students should contact their Honors adviser.

### Bridge Programs

James Clarke and Cris Gleicher, Co-Directors  
718-780-4023

Housed within the University Honors Program, the Summer Bridge Project offers qualified high school juniors an opportunity to experience college while still attending high school. High school juniors with averages of 79 or higher (C+ average) are eligible to apply. Students accepted to the Summer Bridge Project participate in an interdisciplinary summer program designed to help prepare them for college. Successful completion of the summer project allows students to participate

in the Senior Bridge Program, which permits high school seniors to take up to two introductory-level college courses on a tuition-waived basis.

Laboratory fees and book costs are not covered by the program. For more information on the Summer Bridge Project and an application, contact the program directors.

## Arthur O. Eve Higher Education Opportunity Program (HEOP)

Okarita Stevens, Diana Voelker,  
Co-directors;  
718-488-1043

Higher Education Opportunity Program (HEOP) grants are available for entering freshmen and a limited number of transfer students from other EOP, HEOP, and SEEK programs. The Higher Education Opportunity Program is a New York State funded five-year program of study specifically designed for students who are educationally and economically “disadvantaged.” Supportive services, including tutorials, academic, personal and career counseling, and a program of developmental courses (for those identified as needing such a program) are available for HEOP students. The program’s office is located in Room 410 of the Pratt Building.

HEOP grants are renewable for succeeding years depending on continued announcements of awards from the New York State Education Department to LIU. In addition, the student must maintain a satisfactory academic average, remain in a full-time regular degree-seeking classification, and demonstrate continued progress toward a degree.

In order to be eligible for benefits under HEOP, a student must

1. Be both economically and educationally “disadvantaged” according to the guidelines of HEOP;
2. Be a graduate of a high school approved and accredited by the New York State Education Department or have a New York State Equivalency Diploma or an Armed Forces Equivalency Diploma
3. Have potential for the successful completion of a postsecondary program;
4. Be a resident of New York State for 12 months before the date of application; and
5. Apply to the Tuition Assistance Program and the Pell Grant Program.

Students enrolled at LIU Brooklyn in the Higher Education Opportunity Program are admitted under fully matriculated status.

For further information, write Director, Higher Education Opportunity Program, Room P-410, LIU Brooklyn, 1 University Plaza, Brooklyn, NY 11201-5372.

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## Student Support Services

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Diana Voelker, Director  
Dr. Joanne Hyppolite, Associate Director  
718-488-1044

Student Support Services is a federally funded TRIO program which aims to encourage and assist students who are traditionally under-represented (first generation, low income) in postsecondary education, as well as provide qualified students with disabilities with appropriate academic accommodations and support needed to ensure equal access, in the preparation for, entry to, and completion of a post secondary degree.

The Office of Student Support Services provides opportunities for academic development with the aim of increasing the retention and graduation rates of its students. This is done by:

- Pairing all registered students with an education specialist who will guide and work with them for the duration of their academic career
- Ensuring that all students receive academic tutoring and instruction in areas such as reading, writing, math and science
- Routinely monitoring the academic progress of its students
- Identifying current and potential problem areas, devise and implement interventions and make appropriate referrals
- Acting as a liaison for students with disabilities
- Improving financial and economic literacy

In order to receive accommodations under the Americans with Disabilities Act a current or incoming student must:

- have a physical or mental impairment which substantially limits any major life activity
- have a record of such an impairment
- be regarded as having such an impairment

Students who wish to receive accommodations must self identify to the Office of Student Support Services.

For additional information please contact our office at the number above or visit our website [www.liu.edu/Brooklyn/StudentLife/SSS](http://www.liu.edu/Brooklyn/StudentLife/SSS).

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## Kumble Theater

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The Kumble Theater for the Performing Arts at LIU Brooklyn is a dynamic, state-of-the-art performance venue serving one of the most diverse campuses and communities in the country. It is designed to nourish artistic exploration and development by students and other emerging artists while providing the entire community greater access to an exciting range of Broadway-quality, classical and cutting-edge professional performances.

Impeccably crafted for the dramatic and technical demands of dance, music and theatrical productions, this elegant, 320-seat theater provides finely tuned acoustics and top-tier lighting, projection and other electronic capabilities. With a stage featuring a "sprung" floor extending to the

seating area, the theater fosters an intimacy between performers and their audiences.

This extraordinary theater was made possible through the generosity of LIU Trustee Steven J. Kumble. It is part of an ambitious campus renovation that created an extensive performing arts complex also featuring a black box theater, dance studios and a glass-enclosed art gallery. Among other major supporters of the performing arts complex are the EAB/Citigroup Foundation, through LIU Board of Trustees Chair Edward Travaglianti, trustees Bruce C. Ratner and Donald H. Elliott, the City of New York and the Independence Community Foundation.

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## Steinberg Wellness Center

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This 112,000 square foot facility supports the Campus' 18 Division I Athletic teams, provides a state-of-the-art workout facility and swimming pool for the Campus Community, and offers a broad array of health and wellness services to our students, faculty, and administrators, as well as the members of the Brooklyn community at large.

Steinberg Wellness Center features a 2,500 seat arena, which hosts the Campus' Division I basketball and volleyball games, high school athletic events, and a variety of other special events. The fitness center includes state-of-the-art cardio and strength equipment, and a group exercise studio that includes free classes such as Pilates, yoga, hip hop dance, total body conditioning, Salsa, and abs-workout classes. The facility also includes a 25-yard, eight lane swimming pool and a rooftop track and tennis courts.

Steinberg Wellness Center encompasses the Health and Wellness Institute which provides activities and programs that promote good health and wellness behaviors that reduce health disparities and improve the quality of life for members of the Campus community and the community at large. The Health and Wellness Institute houses one of New York City's only state-of-the-art HydroWorx 2000 therapeutic pool, which includes an elevating floor to allow for easy access and varied water levels, an underwater treadmill with speeds up to 8.5 mph, underwater video camera and viewing monitors, body weight-support harness system, adjustable temperature control, and jets that propel water and can be used to resist movement and to challenge a person's balance.

The Harriet Rothkopf Heilbrunn Academic Nursing Center is also located in the cellar level of the Steinberg Wellness Center. The HRH Academic Nursing Center's mission is to reduce health disparities among high-risk populations by providing accessible and affordable, primary, secondary and tertiary prevention activities focusing on risk assessment, education, counseling, and referral for vulnerable, underserved populations in downtown Brooklyn including the students and employees of LIU

Brooklyn. The Center provides free health screenings, programs to monitor existing health conditions, Mammogram and HIV testing and counseling and support programs.

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## Lupus Cooperative of New York

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The Lupus Cooperative of New York (LCNY) has a local office at 9 Hanover Place. The LCNY is a program of the SLE Lupus Foundation and its goal is to improve care for people living with lupus. The LCNY helps in getting people with signs and symptoms of lupus diagnosed, properly treated, and supported both emotionally and practically for daily living with this chronic disease. It offers multilingual information and education about lupus. The LCNY also provides monthly support groups, one-to-one short-term counseling, assistance with accessing public programs and services for people with lupus. In addition, the LCNY help clients with referrals to find doctors and other health professionals and participates in community outreach in order to increase lupus awareness.

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## OFFICE OF STUDENT DEVELOPMENT AND RETENTION

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Phone: 718-488-1042      Email: [bkln-OSDR@liu.edu](mailto:bkln-OSDR@liu.edu)

The Office of Student Development and Retention is a unique collaboration of student support departments with a mission to assist LIU students in achieving their academic, professional and personal goals. Our dedication to students begins freshman year and continues through graduation. First Year Programs, Sophomore Year Programs, and Career Services & Senior Year Advising offer academic advising, career counseling, instruction, coaching and mentoring so that students can create a plan for success that is individually crafted to meet their specific needs. All Departments of the Office of Student Development and Retention are located in Pratt Room 510.

- First Year Programs: 718-488-3378
  - Sophomore Year Programs: 718-488-1605
  - Career Services and Senior Year Advising: 718-488-3311
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### First Year Programs

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The mission of First Year Programs is to provide all new students with a supportive community while helping them build a foundation for academic success and personal development. Through specialized advising, exploration communities, credit bearing courses, and orientation programs, First Year Programs offers new students personal support and guidance in discovering academic opportunities, developing life skills, exploring leadership opportunities, and forming meaningful relationships. It is our goal to help all new students acclimate to university life and ensure that they become an integral part of LIU Brooklyn while excelling academically.

First Year Programs include the following components.

#### Freshman Advising

Freshman Advisors help students achieve a full understanding of university core requirements as well as provide accurate information on institutional policies, procedures, resources, and programs.

#### Orientation

New Student, Out-of-State and Transfer Orientation have been designed to help all new students begin their college years with the class schedule, information, skills and personal relationships needed to create a successful first-year experience.

#### Plan for Academic Success

A special first-year initiative that offers its students personalized attention and one-on-one academic counseling.

#### Welcome Week

Kicking off Orientation Seminar I class, Welcome Week helps first-year students further explore the various activities, opportunities and assistance available to LIU students on the LIU Brooklyn campus.

#### Orientation Seminar I

All freshmen and transfer students with fewer than 24 credits register for this dynamic and interactive seminar designed to provide students with the information and skills needed to thrive academically, professionally and socially.

#### Learning Communities at LIU Brooklyn

The Learning Communities at LIU Brooklyn offer an engaging and fun opportunity for students to explore various core courses with specialized themes with a select group of first-year students. Students involved in the Learning Communities will work closely with their advisors and professors to cultivate a unique and fulfilling first year experience.

#### Peer Leader Program

Peer Leaders provide first-year students with the insights, advice and support necessary to achieve success in college.

#### Orientation Leader Program

Orientation Leaders provide personality and support in organizing and conducting new Student Orientation days throughout the summer.

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## Sophomore Year Programs

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Sophomore Year Programs develops students scholastically, professionally, and fiscally; while encouraging student potential and active participation in campus life. They facilitate the transition of students from their first year to their second, supports them throughout their sophomore year, and enables them to progress into their junior year with confidence and focus.

Sophomore Year Programs includes pre-professional program advising, undeclared major counseling, probationary student programming, major exploration workshops; personality, skills, interests, and values assessments; major selection and job prospect correlations, resume reviews, interviewing techniques, the COOP 1: Career Readiness course, and financial literacy workshops. Sophomore Year Programs fosters student leadership potential, promotes student engagement in campus activities, clubs, and events; and provides opportunities for community service.

As an essential component of Sophomore Year Programs, the Scholarship Assistance Program provides information, support and guidance through the scholarship search and application process. Working with the Sophomore Year Programs staff, students discover additional opportunities to finance their education. Sophomore Year Programs staff develop an individualized plan of action for each student, while encouraging students to become engaged in their studies, with their professors and within their campus community.

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## Career Services and Senior Year Advising

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Stephanie Steinberg, Assistant Dean

The Office of Career Services and Senior Year Advising provides a comprehensive array of services and programs to help LIU Brooklyn students navigate the career planning process. We help students to successfully and confidently formulate, prepare for and manage their professional careers and secure work opportunities while in school and after graduation, ensuring their effective transition to the workplace post-graduation.

You are encouraged to meet with your career counselor, who specializes in your major, each year, beginning Freshman year. Through one-on-one counseling, we will help you:

- Identify your skills and interests through the Strong Interest Inventory® and explore suitable career paths and industries
- Navigate our job bank/career management system, MyCareerKey
- Secure internships in your field of interest; connect you with classes such as Coop 1 and Coop 2 to satisfy internship credit if necessary
- Create resumes and other job-search tools that position you as a strong candidate in a competitive market
- Prepare for interviews and job fairs through mock interviews
- Conduct your degree audit, facilitating timely graduation

Through our Internship program, students have the opportunity to gain hands-on professional experience related to academic studies, participate in professional development programs and apply for department monetary awards.

The office also sponsors workshops on timely topics such as using social networking in job search. We sponsor recruitment events such as career fairs, employer spotlights and on-campus interviews, as well as opportunities to meet with and learn from seasoned professionals. We promote off-campus career events as well. Our Alumni Mentor program is another great resource for students as they explore different career options.

Two programs that offer students skill-building work experience include The America Reads/Counts Program, which is a federally funded work-study program where students tutor school age children, and the national JumpStart program, which pairs college students with preschool children to build their language, literacy and social skills.

Students may schedule an appointment by calling 718-488-1042 or meet with a career counselor during walk-in hours in Pratt 510. Please visit us online at: [www.liu.edu/brooklyn/careerservices](http://www.liu.edu/brooklyn/careerservices).

## POLICIES AND REGULATIONS AFFECTING STUDENTS

This section is provided for informational purposes. It should not be construed to be a comprehensive presentation of all policies and regulations that affect students of LIU Pharmacy but rather as a distillation of those policies and regulations of which every student should be aware.

### Standards of Professional and Ethical Behavior

#### Academic Ethics

Students are expected to conduct themselves in accordance with the highest academic standards of honesty and integrity. The acts of, or the intent to engage in the acts of, cheating, plagiarism, illegitimate possession and/or disposition of examinations, and similar acts, are grounds for suspension or dismissal from the University. Students are advised that plagiarism consists of any act involving the offering of the work of someone else as the student's own, including the use of work authored by a paid or volunteer person or organization contracted by the student. Students participating in experiential courses must adhere to all rules and regulations of the specific hospital, long-term care facility, industry site, etc.

### LIU Pharmacy Honor Code

#### I. Statement of Philosophy

As students enrolled in a professional program, pharmacy students of LIU Pharmacy represent the University, the College, and the profession of pharmacy. As such, it is imperative that students conduct themselves in a professional manner, both academically and in any other situation where they are viewed as representatives of the University, the College, and/or the profession. It is imperative that pharmacy students shall be of good moral character and recognize a responsibility to participate in activities contributing to an improved community. Pharmacy students caring for patients must not be harmful, dangerous or negligent to the welfare of the patient. Therefore, standards of professional and ethical behavior have been developed as a guide for students to prepare them to meet the standards of the profession of pharmacy.

With all professions, it is the responsibility of the individual to be aware of all applicable standards (including academic, professional, ethical, and legal) and to follow them to the best of his/her ability at all times. Not knowing these standards is considered to be unprofessional, and does not provide defense in the case of errors in practice or unprofessional behavior. Therefore, each pharmacy student is required to become

aware of and follow these standards, and adhere to the rules and regulations of the University, LIU Pharmacy, the experiential practice sites, and the profession of pharmacy. The elements of the professional commitment required of pharmacy students are outlined in the Pledge of Professionalism taken by pharmacy students, which reads as follows:

“As a student of pharmacy, I believe there is a need to build and reinforce a professional identity founded on integrity, ethical behavior, and honor. This development, a vital process in my education, will help ensure that I am true to the professional relationship I establish between myself and society as I become a member of the pharmacy community. Integrity must be an essential part of my everyday life and I must practice pharmacy with honesty and commitment to service.

To accomplish this goal of professional development, I as a student of pharmacy should:

**DEVELOP** a sense of loyalty and duty to the profession of pharmacy by being a builder of community, one able and willing to contribute to the well-being of others and one who enthusiastically accepts the responsibility and accountability for membership in the profession.

**FOSTER** professional competency through life-long learning. I must strive for high ideals, teamwork and unity within the profession in order to provide optimal patient care.

**SUPPORT** my colleagues by actively encouraging personal commitment to the Oath of Maimonides and a Code of Ethics as set forth by the profession

**INCORPORATE** into my life and practice, dedication to excellence. This will require an ongoing reassessment of personal and professional values.

**MAINTAIN** the highest ideals and professional attributes to ensure and facilitate the covenantal relationship required of the pharmaceutical care giver.

The profession of pharmacy is one that demands adherence to a set of rigid ethical standards. These high ideals are necessary to ensure the quality of care extended to the patients I serve. As a student of pharmacy, I believe this does not start with graduation; rather, it begins with my membership in this professional college community. Therefore, I must strive to uphold these standards as I advance toward full membership in the profession of pharmacy.”

The standards of academic conduct, outlined in the sections that follow, apply not only to students enrolled in the professional program, but also to students enrolled in any of LIU Pharmacy's graduate programs. As such, violations of the Code by students enrolled in these programs are handled in a manner similar to that of students enrolled in the professional program.

#### II. Academic Integrity

Students shall deal honestly with people, including colleagues, faculty, University representatives, patients, and health-care

providers. Students are expected to demonstrate honesty and integrity throughout all aspects of their education. Specifically, students are responsible for:

- Understanding the types of conduct that are deemed unacceptable and, therefore, are prohibited by this policy
  - Refraining from committing any act of cheating, plagiarizing, facilitating academic dishonesty, abusing academic materials, stealing, professional misconduct, or similar activities
  - Maintaining a “duty to report” every instance in which students may have knowledge that academic misconduct has occurred; the student must report any infraction of the Code to a faculty member or other appropriate authority (i.e., course coordinator, preceptor, etc.)
- Examples of academic dishonesty include, but are not limited to, the following:

#### *Cheating*

- Use of unauthorized assistance during recitation sessions, quizzes, examinations, or pharmacy practice experiences
- Dependence upon the aid of unauthorized sources in writing papers, solving problems or completing other assignments
- Acquisition or possession, without permission, of examinations or other academic material belonging to a member of the University faculty or staff
- Multiple submission of work by a student that has been used in an identical or similar form to fulfill any academic requirement at the University or any other practice site
- Provision of assistance to others who are participating in the behaviors or activities mentioned above

#### *Plagiarism/Copyright Infringement*

- Paraphrasing without properly crediting the author(s) with footnotes, citations, or bibliographical reference or direct quotation of the work of others without applying quotation marks, and fully and properly crediting the author(s) with footnotes, citations, or bibliographical reference
- Use of materials prepared in collaboration with others without release in writing from the collaborators
- Reproduction of copyright material (e.g., textbooks, handouts, examinations) without obtaining written permission from the copyright owner
- Web-casting/taping or e-mailing lectures without permission of the faculty member or instructor

For further information about what constitutes plagiarism, the student is referred to: [http://owl.english.purdue.edu/handouts/research/r\\_plagiar.html](http://owl.english.purdue.edu/handouts/research/r_plagiar.html).

## *Other*

- Falsification of signatures, transcripts, grade reports, attendance records or other official documents
- Provision of false information regarding a missed examination or assignment
- Providing a false statement to any instructor in an attempt to gain an advantage or exceptions
- Reusing, possessing, photocopying, selling, stealing, or soliciting, in its entirety or in part, of instructor-prepared examinations, lecture materials or assignments unauthorized for release to all students

## *Academic Dishonesty Related to Clinical Practice*

- Falsification of a patient's medical records or providing fabricated information regarding a patient's medical status or treatment presented either verbally or in writing
- Multiple submission of assignments from various practice sites

## *Abuse of Academic Materials*

- Destroying or making inaccessible academic resource materials. Examples include, but are not limited to the following:
- Destroying, hiding, or otherwise making unavailable for common use library, computer, personal digital assistants (PDAs), or other academic reference materials
- Destroying, hiding, or otherwise making unavailable, another's notes, experiments, computer programs, or other academic work

## *Representation*

A pharmacy student shall accurately represent himself/herself to others, including, but not limited to, colleagues, faculty and staff of the University, patients, preceptors, and other health-care providers.

## **III. Professional Integrity**

A student must not be harmful, dangerous, or negligent to the mental or physical health of patients, colleagues, faculty, or the public. Students must be familiar with and abide by the rules and regulations of their assigned experiential practice sites, as well as federal, state, and local laws pertaining to the practice of pharmacy.

## *Demeanor*

The student is expected to be thoughtful and professional when interacting with faculty, patients and their families, physicians, preceptors, other students, and other members of the health-care team. Likewise, students must be respectful of and adhere to LIU Pharmacy's rules and regulations.

Inappropriate behavior includes, but is not limited to:

- Absence from, or lateness to, required College professional activities
- Use of offensive language or gestures
- Intimidation or coercion of fellow students, faculty, staff, and patients

- Posting of offensive and/or unauthorized material on websites where the students are identified as being from LIU Pharmacy - the Arnold & Marie Schwartz College Pharmacy and Health Sciences of LIU

- Defacing University property

Members of LIU Pharmacy are expected to comply with the College policies regarding food and drink in the classroom or clinical setting.

Smoking is not permitted in any part of the LIU Pharmacy indoor facilities.

## *Appearance*

Students shall maintain a neat, clean appearance, and dress in attire that is appropriate for the setting. While in practice experiences and during official College professional events, students must be dressed in professional attire. For men, this includes a dress shirt, tie, and dress slacks or neat-appearing khaki pants. Women should be similarly appropriately and conservatively attired such as in a blouse with skirt or dress pants, or in a dress. Sneakers, open-toe shoes of any kind, work boots or shoes that look like work boots, T-shirts, shorts, and jeans of any color are examples of what is not permitted. In the classroom, students should be dressed in clothes that are clean and neat and are not considered offensive or embarrassing to the faculty or students. Additional/specific dress code requirements may be outlined in individual course syllabi.

## *Impairment*

The student will not use alcohol or drugs in ways that impair his/her ability to perform required work or result in compromised patient care. When a student uses a medication that may impair his/her ability to care for patients, it is his/her responsibility to discuss this with his/her adviser, faculty member, or preceptor at the College or experiential practice site. Students should protect the public from an impaired colleague and assist an impaired colleague in receiving appropriate help with his/her drug or alcohol problem. Students must also refer to the Alcohol Policy and Regulations, detailed in the LIU Brooklyn Student Handbook.

In addition to the Honor Code, students are expected to follow the policies and procedures for criminal background check and drug screening policies for LIU Pharmacy and, when applicable, the affiliated experiential practice site.

## **IV. Pledge of Honor**

All students are expected to sign the following Pledge of Honor upon matriculation to LIU Pharmacy:

"As a student of the Arnold & Marie Schwartz College of Pharmacy and Health Sciences of Long Island University, I will actively pursue behaviors that are consistent with professional conduct, as outlined in the College's Honor Code. I will maintain a professional relationship with faculty,

colleagues, other health care providers, and patients, and will maintain academic integrity, as outlined in the Code. I fully recognize that violation of any of the standards of the Code may result in disciplinary actions, including possible dismissal from the College."

Students are reminded that failure to sign this document does not relieve them from the professional and academic responsibilities set forth in the LIU Pharmacy Honor Code and/or other documents delineating student conduct and behavior.

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## **LIU Pharmacy Violations of Standards of Professional and Ethical Behavior and Academic Integrity**

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Students accused of violating the College's standards of professional and ethical behavior and academic integrity are subject, upon admission of the same, to disciplinary action. Disciplinary actions may include suspension or dismissal from LIU Pharmacy or specific forms of remediation, such as completion of a course on ethics, service requirements to the College or other not-for-profit or charitable organizations or agencies as the College may specify. In cases where the student denies the accusations a Disciplinary Committee consisting of members of the faculty and student representation will be convened to hear the accusations and hear defense on the part of the student. All parties involved may request the presence of other individuals with knowledge pertinent to the case to present evidence. The Disciplinary Committee will present its finding of fact and recommendations as to the disposition of the case to the Assistant Dean for Academic and Student Affairs (or the Associate Dean for students enrolled in the College's graduate programs). Students are advised that they may request the presence of counsel for said hearings only for purposes of observation and advisement. Counsel is not afforded the opportunity to question those appearing before the Committee or to advocate on behalf of the student. Decisions of the Disciplinary Committee and/or the Assistant Dean for Academic and Student Affairs (or the Associate Dean for students enrolled in the College's graduate programs) that the student believes may demonstrate arbitrary and capricious treatment or to be fundamentally unfair may be appealed, as a final step, to the Dean of LIU Pharmacy.

## **LIU Pharmacy Grievance and Disciplinary Procedure**

Students at LIU Pharmacy may expect a scrupulous regard for their rights as students and individuals and should expect to be treated fairly and with courtesy by all members of the academic community. In any matter in which students feel that their rights have been violated, or in matters of

serious dispute with members of the administration or faculty, students may avail themselves of the following formal grievance procedure:

1. The student will write out a clear statement of the grievance.
2. The student may submit this statement to the staff member involved. The student will be given a written response within a reasonable time.
3. If the student is not satisfied with the response, or initially, if preferred, the student may submit a statement to the appropriate division director or department head. The director will review the matter and provide the student with a written response within a reasonable period of time.
4. After a student receives a response from the Division Director, a disciplinary committee may be convened upon the request of the student, the faculty member or the administration. This committee advises either the Assistant Dean for Academic and Student Affairs (Doctor of Pharmacy students) or the Associate Dean (graduate students) regarding the matter; the respective dean's decision is then communicated to the concerned parties. The appropriate dean may initiate disciplinary proceedings upon request of a faculty member or Division Director.
5. If still not satisfied, the student may institute a formal complaint with the Dean of the College in which he or she is enrolled. The Dean will review the matter, hear the student and staff member where appropriate, and see that the proper action is taken.

This procedure shall be a formal grievance procedure for the resolution of all student grievances and disciplinary matters, including those alleging actions prohibited by legislation.

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## Policy for Student Complaints Relating to Accreditation Council for Pharmacy Education (ACPE) Standards, Policies and Procedures

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ACPE is required to demonstrate to the U.S. Secretary of Education its expectations regarding a program's recording and handling of student complaints. In addition, ACPE must demonstrate a link between its review of complaints and its evaluation of a program in the accreditation process. Therefore, ACPE has adopted the following policy: "The colleges and schools of pharmacy have an obligation to respond to any written complaints by students lodged against the college or school of pharmacy, or the pharmacy program that are related to the standards and the policies and procedures of ACPE. The college or school of pharmacy shall establish, implement and maintain a student complaint procedure that affords the complainant fundamental procedural

due process. The college or school of pharmacy should communicate the complaint policy to students. The college or school of pharmacy, or the pharmacy program, shall maintain a file that contains the written complaint, a written record of each step of the complaint procedure and the outcome, except as otherwise prohibited by state or federal law. The files shall be made available for inspection to ACPE on on-site evaluations, or otherwise at ACPE's written request. The findings of this inspection, and the resulting implication(s) to the accreditation of the professional program, shall be noted in the Evaluation Team Report." In order to comply with the ACPE policy regarding student complaints relating to ACPE standards, policies and procedures, the policy of LIU Pharmacy is to provide:

1. Student access to ACPE standards, policies and procedures
2. Communication of complaint policy to students
3. Procedure for student complaints

### Student Access, Posting and Communication of Policy

A copy of ACPE standards, policies and procedures and a copy of the LIU Pharmacy policy relating to this issue are available in the Office of the Dean. It is available for review by any student enrolled in LIU Pharmacy, but may not be removed from the Office of the Dean.

A copy of ACPE standards, policies and procedures is also available on the ACPE website, [www.acpe-accredit.org](http://www.acpe-accredit.org). The following shall serve as the notification to students of the complaint policy and the procedure for student complaints:

### Complaint Policy and Procedure for Student Complaints

The grievance procedure for students shall require a formal written complaint describing the specific violation of ACPE standards, policies or procedures. The written complaint should include a description of the ACPE standard, policy or procedure in question; grounds for appeal; a summary of the argument; and supporting evidence. This shall be delivered to the office of the Dean of LIU Pharmacy. Upon receipt of a written complaint, an ACPE Grievance Committee, composed of the Division Directors, Chairs of the Curriculum and Scholastic Committees, the Associate Dean for Academic and Student Affairs and a student representative, shall be convened to review the complaint. A formal, written reply to the student(s) from the Grievance Committee shall include an evaluation of the complaint, a description of any violations, and a proposal for any necessary corrective action. This process shall usually take no longer than 90 days. Decisions of the Grievance Committee that demonstrate arbitrary and capricious treatment or that are fundamentally unfair may be appealed, as a final step, to the Dean of LIU Pharmacy. This process is the sole avenue for student complaints regarding ACPE standards, policies and

procedures.

A record containing student complaints and written records of the complaint procedure and outcomes shall be maintained in the Office of the Dean of LIU Pharmacy, and shall be available for review by ACPE or its representatives upon written request or in the process of an on-site evaluation visit.

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## LIU Pharmacy Statement on Religious Diversity and the Academic Calendar

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Religious diversity has formed a part of LIU Pharmacy's curricular and extracurricular programs since its founding. In order to advance religious diversity the College makes reasonable accommodations for students whose religious holy days coincide with their work schedules and classroom assignments. The College neither promotes any particular form of religion nor discriminates against students on the basis of their religious viewpoints.

College holidays are not religious holy days, although a religious holy day may from time-to-time coincide with a College holiday. The College attempts to make reasonable accommodations in its work assignments, test schedules, and classroom attendance in ways that do not unfairly burden students.

Students who notify the faculty of a religious holy day conflict in a timely manner shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith. Where attendance is mandatory, students compelled by their religious convictions to refrain from attending class on specific days must notify their instructors no later than the third week or one week before the absence if a conflict occurs before that time.

Students who notify their instructors of a religious holy day conflict in a timely manner shall be permitted a reasonable amount of time to make up the material or activities covered in their absence, including examinations. Students who receive an exemption on religious grounds cannot be penalized for failing to attend class on the days exempted. The instructor may, however, appropriately respond if the student fails to satisfactorily complete any alternative assignment or examination.

In those cases where a request for an excused absence based upon a religious holy day conflict is denied by the instructor, a student may pursue a grievance under "LIU Pharmacy Grievance and Disciplinary Procedures" (posted above in Policies & Regulations affecting Students). Where a timely request is made but denied by the instructor, the grievance process shall be expedited as much as reasonably possible to ensure that a student pursuing a religious holy day accommodation is not unduly disadvantaged by the passage of time.

Students with attendance conflicts may be

required to notify an instructor in writing. An instructor who requires written notice must inform the class of this expectation in the class syllabus. An instructor may deny a student's request for an excused absence on the ground that the request was not made within a reasonable time period, that is, no later than the third week of class or one week before the absence if a conflict occurs before that time.

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### **LIU Pharmacy Official Correspondence**

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Every student is required to report his or her correct residential address to the LIU Brooklyn Office of the Registrar. This address must be the student's actual residing address while in attendance at LIU Pharmacy. Reporting the parent's address is not acceptable unless the student is currently in residence with the parent. Address changes should be submitted to the Office of the Registrar within three days of a change of residence.

Official correspondence from LIU Pharmacy that is intended for delivery by the United States Postal System by first class, third class or other classes of mail will be mailed to the address the student lists with the Office of the Registrar.

Official correspondence from the College is also regularly sent to students by electronic mail. Every student of LIU Pharmacy is considered to be on notice of the information contained in e-mail messages sent by the College to the student's official e-mail address. All students of LIU Pharmacy are assigned an official LIU e-mail alias (firstname.lastname.@my.liu.edu) that serves as the official LIU e-mail address. Official e-mail correspondence from LIU Pharmacy is sent to that address.

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### **LIU Pharmacy Picture Student Identification**

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All students of LIU Pharmacy are expected to obtain and retain an official LIU Brooklyn student identification card that bears their individual photograph. In addition to other uses on campus, students in the College are expected to present this form of identification at the start of most examinations administered by the College.

## PROFESSIONAL PROGRAM

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LIU Pharmacy — Arnold & Marie Schwartz College of Pharmacy and Health Sciences offers a six-year Doctor of Pharmacy (Pharm.D.) degree program to prepare students for entry-level pharmacy practice. The program consists of two years of preprofessional studies and four years of professional studies.

## PROFESSIONAL PROGRAM FOR THE SIX-YEAR DOCTOR OF PHARMACY

### Introduction

LIU Pharmacy offers a six-year curriculum leading to the entry-level degree of Doctor of Pharmacy (Pharm.D.). Students may enter the professional phase of the program in the Fall semester only.

The Doctor of Pharmacy program consists of four years of undergraduate-level study and two years of graduate-level study. Students completing the Doctor of Pharmacy program do not earn a baccalaureate degree after completing the program or prior to beginning the graduate-level phase of the program.

### Degree Requirements

*(For students entering the professional-phase (third-year) of the program beginning in Fall 2015 or after)*

Upon recommendation of the faculty, and approval by the Board of Trustees, the degree of Doctor of Pharmacy is conferred by Long Island University upon a candidate who has completed the required curriculum, containing a minimum of 218-219 academic credits (depending upon admission status). Matriculants must maintain a cumulative and a professional phase grade-point average of at least 2.33 to remain in good academic standing. In addition, all students of LIU Brooklyn, including pharmacy students, are required to demonstrate computer proficiency as a requirement towards the attainment of a degree. All entering freshmen students are encouraged to take the LIU Brooklyn proficiency examinations in computer literacy before registering. The examinations are administered by the LIU Brooklyn Testing Center and all students must successfully complete these examinations as part of the requirements for a degree. Transfer students are also required to pass these examinations or will be granted appropriate waivers at the time of the evaluation of their transfer credits.

All students of LIU Brooklyn must satisfy the requirements of the Writing Across the Curriculum Program (WAC). To fulfill the minimum WAC requirements, students must complete, in addition to English 16 and Core Seminar 50, at least one writing-intensive course in their discipline. The writing-intensive course for the Doctor of Pharmacy program is PHM 420 Principles of Health Behavior and Patient-provider Communication.

*(For students starting the professional-phase*

*(third year) of the program prior to Fall 2015.)*

Upon recommendation of the faculty, and approval by the Board of Trustees, the degree of Doctor of Pharmacy is conferred by LIU upon a candidate who has completed the required curriculum, containing a minimum of 212-214 academic credits (depending upon admission status). Matriculants must maintain a cumulative and a professional phase grade-point average of at least 2.330 to remain in good academic standing. In addition, all students of LIU Brooklyn, including pharmacy students, are required to demonstrate computer proficiency as a requirement towards the attainment of a degree. All entering freshmen students are encouraged to take the LIU Brooklyn proficiency examinations in computer literacy before registering. The examinations are administered by the LIU Brooklyn Testing Center and all students must successfully complete these examinations as part of the requirements for a degree. Transfer students are also required to pass these examinations or will be granted appropriate waivers at the time of the evaluation of their transfer credits.

All students of LIU Brooklyn must satisfy the requirements of the Writing Across the Curriculum Program (WAC). To fulfill the minimum WAC requirements, students must complete, in addition to English 16 and Core Seminar 50, at least one writing-intensive course in their discipline. The writing-intensive course for the Doctor of Pharmacy program is PH 200 Communication Skills in Pharmaceutical Care.

### The Profession of Pharmacy

Dramatic changes taking place in the health-care system are creating many new and exciting roles for pharmacists. The pharmacist is now not only responsible for the safe and effective distribution of prescription and nonprescription medication, but is also assuming the role of pharmaceutical therapy adviser and manager, having increasingly more patient-care responsibilities.

The entry-level pharmacist is expected to participate fully in the management of the patient, including the rendering of independent clinical judgments. The pharmacist must be proficient in the search for and retrieval of information from the scientific literature, utilization of complex pharmacokinetic models to determine appropriate doses, development of individualized pharmaceutical care plans, communication with patients and health professionals, documentation of pharmaceutical interventions taking into account patients' knowledge, beliefs, and behavior, pharmaco-economic analysis of alternative pharmaceutical interventions, and justification of services billed to managed health-care organizations and other payers.

### Curricular Endpoints

- A. Provide patient care in cooperation with patients, prescribers, and other members of an interprofessional health care team based upon sound therapeutic principles and evidence-based data, taking into account relevant legal, ethical, social, cultural, economic and professional issues, emerging technologies, and evolving biomedical, pharmaceutical, social, behavioral, administrative and clinical sciences that may impact therapeutic outcomes.
  1. *Provide patient-centered care through the ability to design, implement, monitor, evaluate, and adjust pharmacy care plans that are patient-specific, address health literacy, cultural diversity, and behavioral/psychosocial issues, and are evidence-based.*
    1. Gather and organize accurate and comprehensive patient information to identify ongoing or potential drug therapy problems.
    2. Interpret and evaluate patient and drug-related data needed to identify actual or potential drug therapy problems.
    3. Design, implement, and defend a course of treatment based on evidence that best addresses the patients' health needs.
    4. Prepare, dispense, and/or administer a pharmaceutical product for patient use based on professional practice guidelines.
    5. Counsel patients to ensure appropriate pharmaceutical care outcomes, and institute programs to maximize compliance to drug regimens.
    6. Educate patients about behaviors that promote health (including drug adherence), maintain wellness, prevent, and control disease.
    7. Monitor patients to optimize therapeutic efficacy and minimize side effects. Develop strategies to manage and minimize potential adverse events.
    8. Display respect and sensitivity for patient and family attitudes, behaviors and lifestyles, paying particular attention to cultural, ethnic and socioeconomic influences while incorporating cultural preferences, spiritual, and health beliefs and behaviors into the patient care plan.
  2. *Manage a successful patient-centered practice (including practice marketing, and ensuring appropriate compensation for medication therapy management and other patient care services)*
    1. Assess the healthcare needs of the patient population of a practice and identify risk factors that would adversely affect patient health.
    2. Design evidence-based disease management programs that incorporate outcome indicators, drug treatment protocols, risk reduction strategies, and education programs

- for health care providers and patients.
3. Develop a written plan for provision of informational and health preventive service and identify potential methods and/or plans to generate physical or financial support from internal and external sources.
  4. Identify the impact of the government and third-party payers on pharmacy operations and understand the basic principles/strategies for negotiating contracts with payers.
  5. Develop strategies for reimbursement of pharmacy services, such as medication therapy management and chronic illness plans.
- B. Manage and use resources of the health care system in cooperation with patients, prescribers, other health care providers, and administrative and supportive personnel to promote health, to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution in order to improve therapeutic outcomes of medication use.
1. *Manage human, physical, medical, informational, and technological resources through the ability to ensure efficient, cost-effective use of these resources in the provision of patient care.*
    1. Describe and demonstrate appropriate utilization of management principles and use of health care resources in the American health care system.
    2. Apply the principles of business planning to develop a business plan that supports the implementation and provision of pharmaceutical care services, identifies and acquires necessary resources, and assures financial success of the practice.
    3. Apply the principles of human resource management to recruit and supervise pharmacy personnel.
    4. Evaluate the quality, effectiveness (including cost-effectiveness), and outcomes from institutional and community-based interventions designed to improve health.
    5. Based on results of continuous assessment, recommend strategies to amend and improve resource utilization.
  2. *Manage medication use systems through the ability to apply patient- and population-specific data, quality improvement strategies, medication safety and error-reduction programs, and research processes to minimize drug misadventures and optimize patient outcomes; to participate in the development of drug use and health policy; and to help design pharmacy benefits.*
    1. Identify and report medication errors and adverse drug reactions to appropriate individuals and organizations
    2. Evaluate information obtained from adverse drug reaction and medication error reporting systems to identify preventable causes.
    3. Recommend and implement actions to minimize the occurrence of adverse drug reactions and medication errors in a health-care system.
4. Apply population-specific data and quality improvement strategies to develop policies that minimize drug misadventure (including medication errors, overdose, and poisoning).
5. Participate as part of a multidisciplinary team in the pharmaceutical care system's process for conducting medication use evaluations.
  6. Identify strategies to assure that all relevant members of a patient population receive needed services (reduce health disparity).
- C. Promote health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk populations, and other members of an interprofessional team of health-care providers.
1. *Provide population care through the ability to develop and implement population-specific evidence-based disease management programs and protocols based upon analysis of epidemiologic and pharmaco-economic data, medication use criteria, medication use review, and risk-reduction strategies.*
    1. Apply population-specific data to identify at-risk populations, factors that determine health status and those that influence the use of health services.
    2. Provide clinical preventive services (based on pharmacists practice activity domains) to improve outcomes and quality of life.
    3. Identify the needs for patient follow-up and referral to other health and disease prevention programs and be able to provide the follow-up and referral when necessary.
    4. Assess and monitor at-risk populations to identify and report health problems, and to prioritize interventions in collaboration with patients, other health professionals, members of the community, and policy makers.
    5. Identify the roles pharmacists play in emergency preparedness (e.g., bioterrorism and chemical terrorism, natural disasters) and response (e.g., medication dispensing, information provision, vaccination response teams, and medical reserve corps) on community and national levels, and ensure that they have the ability to participate in such activities when needed.
  2. *Promote the availability of effective health and disease prevention services and health policy through the ability to apply population-specific data, quality improvement strategies, informatics, and research processes to identify and solve public health problems, and to help develop health policy*
    1. Collaborate with pertinent local and state organizations, health-care providers and policy makers responsible for the development of public health initiatives/policy and identify methods to stimulate their support.
2. Evaluate the outcomes of the program/intervention and recommend improvement strategies.
  3. Continually advocate for improved policies that increase access to health services and reduce health risks.
- D. Develop skills necessary to maintain competency and become self-directed lifelong learners.
1. *Communicate and collaborate with patients, care givers, physicians, nurses, other health-care providers, policy makers, members of the community and administrative and support personnel to engender a team approach to patient care.*
  2. *Retrieve, analyze, and interpret the professional, lay, and scientific literature to provide drug information and counseling to patients, their families or care givers, as well as other health-care providers.*
  3. *Demonstrate expertise in informatics*
  4. *Carry out duties in accordance with legal, ethical, social, economic, and professional guidelines.*
  5. *Maintain professional competence by identifying and analyzing emerging issues, products, and services.*
- As reflected in these endpoints, LIU Pharmacy has defined the general educational and professional outcomes and abilities expected of today's graduates. The curriculum was designed to prepare students for an entry-level position in any aspect of the profession— e.g., community practice, hospital practice, long-term care, managed care and the pharmaceutical industry. Moreover, the curriculum prepares students to continue their education through the pursuit of a graduate degree or by participating in residency and/or fellowship programs. The development of higher-level thinking, active learning, and life-long learning skills are liberally sprinkled throughout the curriculum, particularly in recitation sections, laboratories, and the introductory and advanced practice experiences. Students are afforded the opportunity to register for elective didactic as well as elective experiential (selective) courses in order to help them pursue personal career paths.
- The curriculum begins with a minimum of two years of studies in the liberal arts and sciences. Studies in the physical and biological sciences and mathematics in the preprofessional years prepare the student for studies in the pharmaceutical and biomedical sciences in the professional phase of the curriculum. Studies in the humanities and social sciences provide that common and universally accepted body of knowledge all educated men and women are expected to acquire, irrespective of vocational or professional objectives. Thus, the curriculum offers students the opportunity to develop an understanding of the relationships among the arts and sciences and to apply that understanding to human concerns in their professional and personal lives.
- The professional phase of the curriculum

consists of studies in the pharmaceutical and biomedical sciences that are of such depth, scope, timeliness, quality, sequence and emphasis as to provide the foundation for and support of the intellectual and clinical objectives of the professional program. Most of the courses in the biomedical and pharmaceutical sciences are part of a sequence and, as such, are coordinated within a lock-step approach, i.e., students master a given topic after which additional material is presented to bring the student to a higher level. Within each discipline, the courses are vertically and horizontally integrated and coordinated to ensure that the curricular endpoints and specific course objectives are met. Studies in the behavioral, social and administrative pharmacy sciences provide the basis for understanding and influencing human behavior in health and disease, in the management process of pharmacy, and in pharmacy's interrelationships with health-care systems. Courses in these sciences provide the knowledge, skills, abilities, attitudes and values necessary for the efficient and effective management of patient-centered practice.

Studies in pharmacy practice develop the understanding of important disease states and rational therapeutics of these conditions. The coursework is designed to develop the abilities of students to utilize pathophysiologic, pharmacotherapeutic and pharmacoeconomic principles to formulate pharmaceutical care plans for patient management. Development of pharmaceutical care plans includes problem identification, data collection and evaluation, implementation of appropriate therapy, and monitoring patient outcomes based upon the patient's biopsychosocial needs. Additionally, studies in pharmacy practice prepare the student to effectively utilize pharmaceutical information sources and data bases that are necessary, in the course of pharmacy practice, to physically assess patients who are about to receive or are receiving medications, and to administer medications via various routes such as injection and inhalation.

The experiential education components of the professional program are of such intensity, breadth and duration as to support the achievement of the curricular endpoints. Experiential education begins virtually the first day the student enters the professional program and continues until graduation. Introductory pharmacy practice experiences are offered during the early sequencing of the curriculum for purposes of providing transitional experiential activities and active learning. The introductory practice experience begins with a visitation program in the students' first professional semester and provides an orientation to the practice of pharmacy and the provision of pharmaceutical care in a number of environments. In the second professional year the introductory clerkship offers students the opportunity to develop pharmaceutical care plans for patients, counsel patients about prescription and nonprescription items, interact with health-

care professionals and assist in the dispensing of prescriptions. The advanced pharmacy practice experiences in the final year of the professional curriculum provide students with active participation and in-depth experiences to acquire practice skills and judgment to develop the level of confidence and responsibility needed for independent and collaborative pharmacy practice.

These experiences serve as a capstone and require students to utilize all knowledge, skills, attitudes and behaviors previously learned. A wide range of advanced practice experiences is offered. The core experiences ensure that students have developed the competency to participate in the drug use decision making process, to select the correct medication and dosage for a given situation, to interact with health-care professionals and peers, to communicate with patients and/or care-givers, to solve issues related to the rational use of medications and document them, to utilize drug information skills to respond to queries, to assist pharmacists in dispensing commercially available as well as extemporaneously prepared medications, and to develop in-depth pharmaceutical care plans. The elective advanced practice experiences continue this process, yet allow students to fulfill individual professional needs.

### Preprofessional Phase Course of Study

The preprofessional phase of the program, offered through Richard L. Conolly College, consists of a minimum of four semesters of coursework in the liberal arts and sciences. Successful completion of two years of preprofessional study (P-1 and P-2) provides the foundation for admission to the professional pharmacy curriculum. The course sequence for the preprofessional phase is listed below. For course descriptions, please refer to the LIU Brooklyn undergraduate bulletin.

Credentials of students attending other colleges for the preprofessional phase of the program will be evaluated on an individual course basis, and transfer credit will be granted for those courses meeting the requirements of LIU Pharmacy. Only those preprofessional students who meet the progression requirements, as outlined under the heading of Admission, will be admitted to the first professional year of study in LIU Pharmacy.

While the preprofessional phase of the program is designed to be completed in two academic years, students requiring proficiency and skills courses may have a lengthened course of study.

The preprofessional pharmacy curriculum consists of the following course of study:

#### Preprofessional Studies

(For students entering the professional-phase (third-year) of the program beginning in Fall 2015 or after)

#### (Four Semesters)

<i>First Semester</i>	
General and Inorganic Chemistry (CHM 3)	4
General Biology (BIO 1)	4
English Composition (ENG 16*)	3
Introduction to Psychology (PSY 3)	3
The University: Discovery and Change (Orientation Seminar) (OS 1)	<u>1</u>
	15
<i>Second Semester</i>	
General and Inorganic Chemistry (CHM 4)	4
General Biology (BIO 2)	4
Idea of the Human (Core Seminar) (COS 50)	3
Calculus I (MTH 40**)	4
Economics (ECO 1 or 2)	<u>3</u>
	18
<i>Third Semester</i>	
Organic Chemistry (CHM 121)	4
Physics for Pharmacy (PHY 27)	4
English Literature (ENG 61, 62, 63 or 64***)	3
Philosophy or History (PHI 61 or HIS 1****)	3
Physiology/Anatomy I (lecture and lab)	4
Pharmacy Orientation Seminar (PHM 1)	<u>0</u>
	18
<i>Fourth Semester</i>	
Organic Chemistry (CHM 122)	4
Physiology/Anatomy II (lecture and lab)	4
English Literature (ENG 61, 62, 63 or 64***)	3

Philosophy or History (PHI 62 or HIS 2****)	3
Microbiology (BIO 101)	<u>4</u>
	18

**Preprofessional Studies**

*(For students entering the professional-phase  
(third-year) prior to Fall 2015)*

**(Four Semesters)**

*First Semester*

Chemistry 3 (General Chemistry I)	4
Biology 3 (General Biology I)	4
English 16* (English Composition)	3
Mathematics 30** (Precalculus)	4
The University: Discovery and Change (Orientation Seminar) (OS 1)	<u>1</u>
	16

*Second Semester*

Chemistry 4 (General Chemistry II)	4
Biology 4 (General Biology II)	4
Core Seminar 50	3
Mathematics 40	4
Speech 3	<u>3</u>
	18

*Third Semester*

Chemistry 121(Organic Chemistry I)	4
Physics 27 (Physics for Pharmacy)	4
English 61-64 *** (English Literature)	3
History 1 or Philosophy 61 ****	3
Psychology 3 (General Psychology)	3
Pharmacy Orientation Seminar 1	<u>1</u>
	18

*Fourth Semester*

Chemistry 122 (Organic Chemistry II)	4
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Biology 131 (Human Anatomy)	4
Economics 1 or 2 (Micro- or Macro- economics)	3
English 61-64*** (English Literature)	3
History 2 or Philosophy 62 ****	<u>4</u>
	18

*\* Students are admitted into English 16 by  
placement examination or exemption from English  
13, 14.*

*\*\* Mathematics placement examinations are  
required to determine prerequisites, if any.*

*\*\*\* All Pharmacy students must successfully  
complete two courses from the English 61, 62, 63,  
64 sequence.*

*\*\*\*\*All Pharmacy students must successfully  
complete both Philosophy 61 and 62 or History 1  
and 2. Students may not select one course from the  
Philosophy sequence and one course from the  
History Sequence. LIU Pharmacy strongly  
encourages Pharmacy students to complete the  
Philosophy 61 and 62 sequence.*

**Professional Phase Course of  
Study**

The professional segment of the Doctor of Pharmacy program consists of six semesters of didactic and early experiential coursework and an extramural sixth year of 37.5 weeks of advanced practice experiences, which students complete in hospital, community and other pharmacy practice settings. The professional program provides the specialized education necessary to develop expertise in the ever-broadening field of pharmacy and prepares the student for professional licensure examinations.

All professional courses must be taken in residence. There is no transfer credit for any professional-level course.

All students enrolled in pharmacy courses with an experiential component are required to have satisfactory yearly physical examination reports. A completed health form must be submitted to the Office of Experiential Education by the deadline dates established for each academic term. It is the responsibility of each student to visit a physician and to obtain a physical examination, specific laboratory tests and immunizations at the student's own expense. Students must show proof of quantitative positive titers for rubella, rubeola, mumps, varicella and hepatitis B; proof of vaccination and/or qualitative reports are not acceptable to practice sites. Proof of having received appropriate booster doses of diphtheria and tetanus (or Tdap). Students need to obtain a meningococcal vaccination or sign a form to indicate that they are waiving this requirement.

Students need to obtain a test for exposure to tuberculosis – e.g., a PPD (or Mantoux tuberculin test) or a QuantiFeron – immediately before and then every six months during experiential education. If a PPD is performed, a 2-step test is required annually; other assessments during the year may be with a 1-step procedure. A positive Mantoux (PPD) test will require that the student get a chest x-ray and be assessed for the presence of tuberculosis. The decision to treat the student needs to be discussed with the individual physician. In addition, all students are to be tested for syphilis before commencing an experiential course. Students are also required to obtain an influenza vaccine each year (usually due in October).

The College reserves the right to require additional medical tests or documentation it determines are necessary for protecting the health of the student, other health-care providers and patients. Individual sites affiliated with the pharmacy program may require additional medical information from students, and may require that students submit various forms directly to the experiential site prior to beginning an experiential course.

It is the student's responsibility to fulfill these requirements in order to participate in experiential courses. Failure to submit required reports within the specific time limit automatically results in a monetary fine and may deny admittance of students to pharmacy courses with experiential components. Students must prove that they are knowledgeable of the Health Insurance Portability and Accountability Act (HIPAA) as it relates to pharmacy and complete appropriate OSHA training. As such, students will complete College-sponsored HIPAA and OSHA training programs and might need to complete additional training at individual practice sites.

Prior to beginning introductory and advanced pharmacy practice experiences, each student needs to submit proof of being a U.S. citizen or non-citizen national, is a lawfully admitted immigrant for permanent residence, or is a temporary visitor lawfully admitted for educational study. In addition, students are required to complete a criminal background check, and undergo a toxicology screen to identify drug use. Many sites reserve the right to repeat background checks and drug screens prior to or during an experiential course.

In compliance with the U.S. Public Health Service requirements, it is recommended that pregnant students not enroll in Human Anatomy, Physical Assessment and Drug Administration, or other courses in which students may come into contact with tissue and/or pathogens, or to engage in experiential courses where there are patients/clients with infectious diseases, unless first receiving written permission from their physicians.

**Doctor of Pharmacy Degree Requirements  
(For Students Beginning the Professional  
Phase Fall 2015 and After)**

218-219 Minimum Total Credits Required  
(depending on admission status; see notes for  
courses OS 1 and PH 1) for the Doctor of  
Pharmacy Degree

**Pharmacy Preprofessional Studies**

**Preprofessional Science Course Requirements**  
(All courses [39 credits] from the following table  
are required.)

BIO	1	General Biology	4.00
BIO	2	General Biology	4.00
BIO	101	Microbiology	3.00
BIO	TBD	Anatomy and Physiology I	4.00
BIO	TBD	Anatomy and Physiology II	4.00
CHM	3	General and Inorganic Chemistry	4.00
CHM	4	General and Inorganic Chemistry	4.00
CHM	121	Organic Chemistry	4.00
CHM	122	Organic Chemistry	4.00
PHY	27	Physics for Pharmacy	4.00

**Preprofessional Mathematics Course  
Requirements**

(One course [4 credits] from the following table is  
required.)

MTH	40	Calculus I	4.00
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**Preprofessional English Composition Course  
Requirements**

(Both courses [6 credits] from the following table  
are required.)

COS	50	Idea Of The Human	3.00
ENG	16	English Composition	3.00

**Preprofessional English Literature Course  
Requirements**

(Two courses [6 credits] from the following table  
are required.)

ENG	61	European Literatures I	3.00
ENG	62	European Literatures II	3.00
ENG	63	American Literatures	3.00
ENG	64	Non-Western Literatures	3.00

**Preprofessional Philosophy OR History Course  
Requirements**

(Two courses [6 credits] are required. Both courses  
must be in the same discipline.)

**Philosophy**

PHI	61	Philosophical Explorations I	3.00
PHI	62	Philosophical Explorations II	3.00

**History**

HIS	1	History of Civilizations to 1500	3.00
HIS	2	History of Civilizations Since 1500	3.00

**Preprofessional Economics Course  
Requirement**

(One course [3 credits] from the following table is  
required.)

ECO	1	Introduction to Economics	3.00
ECO	2	Introduction to Economics	3.00

**Preprofessional Psychology Course  
Requirement**

PSY	3	General Psychology	3.00
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**Orientation Seminar**

(This is required of all incoming students entering  
the University with fewer than 24 credits.)

OS	1	The University: Discovery and Change	1.00
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**Preprofessional Pharmacy Orientation Course  
Requirement**

(This course is not required for students  
transferring into the first professional year of the  
Doctor of Pharmacy degree program.)

PHM	1	Pharmacy Orientation Seminar	0.00
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**Professional Grade Point Average**

A 2.330 or above G.P.A. is required in all  
professional coursework in the Doctor of  
Pharmacy degree program.

**Pharmacy Professional Studies Required  
Courses**

**3rd Year Professional Phase**

(All courses in the following table are required.)

PHM	310	Pathophysiology/Immunol ogy	3.00
PHM	311	Pharmaceutics I	2.00
PHM	312	Pharmaceutics II	2.00
PHM	313	Biochemistry	3.00
PHM	314	Pharmacy Profession and the Health Care System	3.00
PHM	315	Pharmacy and Society	2.00
PHM	320	Molecular Biology	2.00
PHM	321	Principles of Pharmacology/Medicinal Chemistry/Toxicology	2.50
PHM	322	Introduction to Pharmacy Law and the Integrated Pharmaceutical Care Lab	1.00
PHM	323	Pharmaceutics III	3.00
PHM	324	Biostatistics	2.00

PHM	325	Introduction to Pharmacy Practice	3.00
PHM	326	Principles of Physical Assessment and Medication Administration	2.00
PHM	300	P-3 Introductory Pharmacy Practice Experience	0.50

**4th Year Professional Phase**

(All courses in the following table are required.)

PHM	410	Human Genetics	2.00
PHM	411	Modular Organ Systems Therapeutics I	3.00
PHM	412	Modular Organ Systems Therapeutics II	3.00
PHM	413	Modular Organ Systems Therapeutics III	2.50
PHM	414	Drug Information and Literature Evaluation	3.00
PHM	420	Principles of Health Behavior and Patient- provider Communication	3.00
PHM	421	Pharmaceutics IV	3.00
PHM	422	Compounding Laboratory I	1.00
PHM	423	Pharmacy Practice Laboratory I	1.00
PHM	424	Modular Organ Systems Therapeutics IV	2.50
PHM	425	Modular Organ Systems Therapeutics V	3.50
PHM	400	Community Practice Introductory Pharmacy Practice Experience	4.00
PHM	401	Acute Care Introductory Pharmacy Practice Experience	1.00

**5th Year Professional Phase**

(All courses in the following table are required.)

PHM	510	Health Care Informatics	2.00
PHM	511	Pharmaceutics V	3.00
PHM	512	Compounding Laboratory II	1.00
PHM	513	Pharmacy Practice Laboratory II	1.00
PHM	514	Practical Application of Biological Sciences	1.00
PHM	515	Pharmacoeconomics and Pharmacoepidemiology	2.00
PHM	516	Modular Organ Systems Therapeutics VI	2.50
PHM	517	Modular Organ Systems Therapeutics VII	2.50
PHM	521	Practice Management	2.00
PHM	522	Public Health & Patient Safety	3.00
PHM	523	Pharmacogenomics	2.00
PHM	524	Clinical Pharmacokinetics	2.00
PHM	525	Pharmacy Law and Ethics	3.00

PHM	528	Modular Organ Systems Therapeutics VIII	3.50
PHM	529	Modular Organ Systems Therapeutics IX	3.00
PHM	500	Institutional Practice Introductory Pharmacy Practice Experience	4.00

**6th Year Professional Phase (Required Advanced Pharmacy Practice Experiences)**

(All courses in the following table are required.)

PHM	610	Acute Care Advanced Pharmacy Practice Experience	5.00
PHM	611	Ambulatory Care Advanced Pharmacy Practice Experience	5.00
PHM	612	Community Practice Advanced Pharmacy Practice Experience	2.50
PHM	613	Institutional Practice Advanced Pharmacy Practice Experience	5.00
PHM	614	Internal Medicine Advanced Pharmacy Practice Experience	5.00
PHM	615	Senior Seminar	0.00

**Professional Electives**

Three courses (9 credits) of professional didactic elective courses are required.

Three courses (15 credits) of elective Advanced Pharmacy Practice Experiences are required.

**Additional Requirement**

Completion of the LIU Brooklyn computer literacy requirement.

**Doctor of Pharmacy Degree Requirements (For Students Beginning the Professional Phase Prior to Fall 2015)**

212-214 Minimum Total Credits Required (depending on admission status; see notes for courses OS 1 and PH 1) for the Doctor of Pharmacy Degree

**Pharmacy Preprofessional Studies**

**Preprofessional Science Course Requirements**  
(All courses [32 credits] from the following table are required.)

BIO	3	Life: Its Origin, Maintenance and Future	4.00
BIO	4	Life: Its Origin, Maintenance and Future	4.00
BIO	131	Human Anatomy	4.00
CHM	3	General and Inorganic Chemistry	4.00
CHM	4	General and Inorganic Chemistry	4.00
CHM	121	Organic Chemistry	4.00
CHM	122	Organic Chemistry	4.00
PHY	27	Physics for Pharmacy	4.00

**Preprofessional Mathematics Course**

**Requirements**

(Both courses [8 credits] from the following table are required.)

MTH	30	Pre-Calculus Mathematics	4.00
MTH	40	Calculus I	4.00

**Preprofessional English Composition Course**

**Requirements**

(Both courses [6 credits] from the following table are required.)

COS	50	Idea Of The Human	3.00
ENG	16	English Composition	3.00

**Preprofessional English Literature Course**

**Requirements**

(Two courses [6 credits] from the following table are required.)

ENG	61	European Literatures I	3.00
ENG	62	European Literatures II	3.00
ENG	63	American Literatures	3.00
ENG	64	Non-Western Literatures	3.00

**Preprofessional Philosophy OR History Course Requirements**

(Two courses [6 credits] are required. Both courses must be in the same discipline.)

**Philosophy**

PHI	61	Philosophical Explorations I	3.00
PHI	62	Philosophical Explorations II	3.00

**History**

HIS	1	History of Civilizations to 1500	3.00
HIS	2	History of Civilizations Since 1500	3.00

**Preprofessional Economics Course**

**Requirement**

(One course [3 credits] from the following table is required.)

ECO	1	Introduction to Economics	3.00
ECO	2	Introduction to Economics	3.00

**Preprofessional Speech Course Requirement**

SPE	3	Oral Communication	3.00
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**Preprofessional Psychology Course**

**Requirement**

PSY	3	General Psychology	3.00
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**Orientation Seminar**

(This is required of all incoming students entering the University with fewer than 24 credits.)

OS	1	The University: Discovery and Change	1.00
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**Preprofessional Pharmacy Orientation Course Requirement**

(This course is not required for students transferring into the first professional year of the Doctor of Pharmacy degree program.)

PH	1	Pharmacy Orientation Seminar	1.00
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**Professional Grade Point Average**

A 2.330 or above G.P.A. is required in all professional coursework in the Doctor of Pharmacy degree program.

**Pharmacy Professional Studies Required Courses**

**3rd Year Professional Phase**

(All courses in the following table are required.)

PH	100	Pharmaceutical Care/Health Care	3.00
PH	101	Social Behavioral Aspects of Pharmaceutical Care/Ethics	2.00
PH	102	Public Health in Pharmacy Practice	3.00
PH	111	Pharmacotherapeutics I	4.00
PH	120	Pharmaceutics I	3.00
PH	121	Pharmaceutics II	3.00
PH	130	Medical Physiology and Pathophysiology	5.00
PH	131	Biochemical Foundations of Therapeutics	4.00
PH	132	Medical Microbiology/Immunology	3.00
PH	133	Pharmacology/Medicinal Chemistry I	4.00
PH	300	Visitation Introductory Pharmacy Practice Experience	0.50

**4th Year Professional Phase**

(All courses in the following table are required.)

PH	200	Communication Skills in Pharmaceutical Care	2.00
PH	201	Pharmacy Law and Ethics	3.00
PH	210	Pharmacotherapeutics II	4.00
PH	211	Physical Assessment and Drug Administration	2.00
PH	212	Pharmacotherapeutics III	4.00
PH	220	Pharmaceutics III	4.00
PH	221	Pharmaceutics IV	4.00
PH	230	Pharmacology/Medicinal Chemistry II	4.00

PH	231	Pharmacology/Medicinal Chemistry II / Pharmacotherapeutics II Recitation	0.00
PH	232	Pharmacology/Medicinal Chemistry III	3.00
PH	311	Institutional Introductory Pharmacy Practice Experience	2.00
PH	312	Community Pharmacy Introductory Pharmacy Practice Experience	5.00

**5th Year Professional Phase**

(All courses in the following table are required.)

PH	400	Practice Management/ Pharmacoeconomics	3.00
PH	410	Pharmacotherapeutics IV	4.00
PH	412	Clinical Pharmacokinetics	3.00
PH	413	Pharmacotherapeutics V	4.00
PH	414	Drug Information and Literature Evaluation	4.00
PH	420	Pharmaceutics V	3.00
PH	421	Self Care	3.00
PH	430	Iatrogenic Diseases	3.00

**6th Year Professional Phase (Required**

**Advanced Pharmacy Practice Experiences)**

(All courses in the following table are required.)

PH	600	Community Pharmacy Advanced Pharmacy Practice Experience	5.00
PH	602	Ambulatory Advanced Pharmacy Practice Experience	5.00
PH	603	Drug Information Advanced Pharmacy Practice Experience	2.50
PH	604	Internal Medicine Advanced Pharmacy Practice Experience	5.00
PH	606	Institutional Practice Advanced Pharmacy Practice Experience	5.00
PH	607	Pharmacy Grand Rounds	0.00
PH	608	Acute Care Advanced Pharmacy Practice Experience	5.00

**Professional Electives**

Three courses (9 credits) of didactic elective courses selected from courses ranging in the PH 240-270 series, PH 440-470 series and/or PH 599 are required.

Two courses (10 credits) of elective Advanced Pharmacy Practice Experiences selected from courses ranging in the PH 620-699 series are required.

**Additional Requirement**

Completion of the LIU Brooklyn computer

literacy requirement.

## PROFESSIONAL COURSE DESCRIPTIONS

### For Students Beginning the Professional Phase Fall 2015 and After.

#### **PHM 300 P-3 Introductory Pharmacy Practice Experience**

The student pharmacist will be expected to "visit" a variety of off-campus locations to observe the practice of pharmacy. More specifically, the student will be assigned to spend one 4-hour afternoon period at each of the following locations: a community pharmacy, a hospital, a long-term care facility, and at a service learning exercise organized by a community pharmacist. Additional sites may be assigned as well. The student also will observe the manner in which complementary and alternative therapies are sold in locations without a pharmacist being available to assist patients.

Following the site visits, each student will need to complete an assignment (which in many cases includes a reflective essay) and participate in a reflective session on campus with a facilitator.

*Credits: 0.50*

*Every Fall*

#### **PHM 311 Pathophysiology/Immunology**

This course covers the fundamental mechanisms, etiology, pathogenesis, and manifestations of common diseases seen in today's world. Students will become familiar with the predisposing factors and pathological processes that lead to disease at the molecular, cellular, organ, and whole body levels. Topics include an introduction to the immune system in health and disease, concepts of microbial pathogenesis and the responses of the host to infection; allergy and hypersensitivity; tissue graft rejection, clinical immunosuppression, the immune system vs. cancer, autoimmune diseases, and congenital and acquired immuno-deficiencies. Students are also exposed to the basic morphologic and functional changes of major disease processes in cardiovascular, respiratory, renal, digestive and endocrine, neurologic, and musculoskeletal systems. Throughout the course, students will be developing critical thinking, problem solving, and life-long learning skills needed in pharmacy practice. At the end of this course, students will be able to describe and explain the pathophysiological mechanisms of major human diseases, and apply this knowledge when learning about the pharmacotherapy of major disease states.

*Credits: 3*

*Every Fall*

#### **PHM311 Pharmaceutics I: Pharmaceutical Calculations**

This course is designed to enable students to perform calculations requisite for the study and practice of pharmacy. The course also provides a basic understanding of statistics necessary for the

student's understanding of pharmaceutical and medical literature. After completing the course students will be able to interpret prescription orders and perform all calculations necessary for the preparation of stock solutions and extemporaneous products. The course format consists of lecture and recitation. The students are also provided with problem sheets and text assignments that they must work through on their own. It is believed that diligent and persistent practice is the best way to achieve proficiency and mastery in problem solving. Recitation sessions provide the students with an opportunity to meet in small groups in order to solve more practice problems and understand the material in depth. The recitation periods allow the students to enhance their skills working with other student to solve problems while still allowing ample opportunity for individual work and development. Following completion of this course, students will be able to interpret prescription orders, and perform all calculations necessary for the compounding of prescriptions.

*Credits: 2*

*Every Fall*

#### **PHM312 Pharmaceutics II: Basic Theories in Pharmaceutics**

This course is designed to provide the students with the basic principles and application of physical chemistry in pharmacy. It provides the bases for understanding the chemical and physical phenomenon that govern the in vivo and in vitro actions of pharmaceutical products. This course serves as the foundation for the later study of pharmaceutical manufacturing, dispensing, and biopharmaceutics and pharmacokinetics. Following completion of this course, students will be able to discuss the principles of physical chemistry such as solution theory, diffusion and dissolution, rheology, and kinetics as applied to pharmaceutical systems.

*Credits: 2*

*Every Fall*

#### **PHM313 Biochemistry**

This course provides the biochemical foundation necessary for students to understand the basis of pharmacotherapeutics. Topics include the structure and function of macromolecules, membrane structure and receptor signaling, biomolecular interactions, and the mechanisms of enzyme action. This is followed by the metabolism of carbohydrates, lipids, amino acids, nutrition, nucleotides, and the control of metabolic processes. Clinical correlations are provided throughout the course, and each student will be developing critical thinking, problem solving, and life-long learning skills needed in pharmacy practice due to the use of various active learning techniques.

After completing this course, the student will be able to apply the biochemical principles that are requisite to the understanding of immunology, medicinal chemistry, and pharmacotherapy.

*Credits: 3*

*Every Fall*

#### **PHM314 Pharmacy Profession and Health Care System**

Over the past few decades, pharmacy as a profession has evolved dramatically. This evolution of the pharmacist's role in healthcare has been in sync with several other changes in the health care system. This 3 credit course introduces the student to the dynamic and complex changes that have occurred in the US health care system with an emphasis on the evolution of pharmacists' roles in the provision of health care products and services and pharmacy's relationships with other healthcare providers in the health care system. It will detail the role of the other healthcare professionals and various healthcare settings in which pharmacists provide care currently and may be positioned to provide in the future.

Each class session will require students to think critically and communicate in small as well as large group settings to discuss the evolving nature of the pharmacist's role and the way in which future pharmacists can make a contribution to improving a patient's quality of life and safety.

Following completion of this course, students will be able to critically evaluate and discuss orally and in writing the historical development of the pharmacy profession and how it currently fits in the healthcare system and plays an important role in improving patient safety and patients' quality of life. Students will be able to advocate the professional contributions that pharmacists make in reducing healthcare costs, improving patients' quality of life and patient safety.

*Credits: 3*

*Every Fall*

#### **PHM315 Pharmacy and Society**

Today's pharmacists practice in an increasingly competitive social, political and economic environment, with a vast array of issues affecting their ability to develop, manage, market and get reimbursed for services provided to improve patients' quality of life and patient safety. This course adopts principles from the disciplines of marketing, economics, management, sociology and pharmaceutical policy to provide students with an understanding of the societal and market context in which pharmacists services are provided. An emphasis is placed on the most common programs that pay for pharmacist-provided patient care services. Throughout the course, students will be developing their critical thinking and problem-solving skills so that they are well prepared for developing, managing, marketing and getting reimbursed for their services.

In-class active learning strategies and homework assignments will be utilized to stimulate student critical thinking, decision-making and managerial capabilities.

Following completion of this course, students will be able to describe the pharmacists provided programs and services that are economically viable

and recognized by payers in the healthcare system. Students will be able to identify the societal, political and financial challenges associated with providing quality care to patients and will be able to provide recommendations and solutions to overcome these challenges.

*Credits: 2*

*Every Fall*

### **PHM320 Molecular Biology**

The biological sciences play a growing role in our understanding of disease and the manner in which they should be treated to ensure optimal outcomes for the patient. The goal of this course is to ensure that students have a broad understanding of the basic principles of gene expression, gene replication, and molecular interactions important to biological processes. Topics include mechanisms of DNA/RNA/protein synthesis and function, gene transcription and translation, gene expression and regulation, cell cycle regulation, and molecular biology of bacteria and viruses. Students are also introduced to genetic recombination, DNA biotechnology, and diagnostic molecular biology techniques utilized in the clinical laboratory. Throughout the course, students will be developing critical thinking, problem solving, and life-long learning skills needed in pharmacy practice.

Upon completion of this course, students will be able to explain the principles behind DNA, RNA, and proteins synthesis and regulation. Students also will be able to identify the patient care implications of their new-found knowledge. Student will be able to educate other health care professionals and patients about the importance of DNA sequencing and profiling in improving patient outcomes.

*Credits: 2*

*Every Spring*

### **PHM321 Principles of Pharmacology, Medicinal Chemistry and Toxicology**

This course introduces students to many of the basic principles surrounding biological science disciplines such as pharmacology, medicinal chemistry, and toxicology. Students will, for example, begin to develop competencies in such areas as pharmacokinetics, pharmacodynamics, the theory of structure activity relationships, and toxicology. The overall course goal is to have the students develop an understanding of the scientific concepts needed to understand and ultimately provide rational drug therapy for individual patients.

Topics include basic pharmacokinetic parameters and concepts, drug metabolism and drug-drug interactions; dose-response relations; toxicity of chemical and pharmacological agents. Students are also introduced to the physiologic and pathophysiologic factors involved in drug absorption, distribution, metabolism and elimination, determinants of variability in drug responses, inter- and intra-patient variability in pharmacokinetics/ pharmacodynamics, and drug interactions. By the end of the course, students will

be able to use basic pharmacokinetic parameters to begin to determine appropriate doses and dosages, and develop/assess dose-response curves to determine relative efficacies and potencies. Student will also be able to explain the rationale for the development of adverse events seen in patients based on an understanding of toxic metabolites and drug-drug interactions. Throughout the course, students will be developing critical thinking, problem solving, and life-long learning skills needed in pharmacy practice by the use of case studies, responses to questions posed by faculty members, and other active learning techniques.

*Credits: 2.50*

*Every Spring*

### **PHM322 Introduction to Pharmacy Law and the Integrated Pharmaceutical Care Laboratory**

Designed to prepare students for their introductory pharmacy practice experiences, this course provides students with an introduction to the principles of and skills required for contemporary pharmacy practice. Specifically, it reviews the various components of the prescription dispensing process, including the initial patient encounter, the patient profile review, preparing and checking the dispensed medication, and counseling the patient. An emphasis will be placed on the laws and regulations that govern this process (e.g., elements required on the prescription and pharmacy label, electronic prescribing, controlled substance laws, patient counseling requirements).

Small group teaching methods are employed to inform and prepare students for the simulated pharmacy practice scenarios to be held in the Integrated Pharmaceutical Care Laboratory. Laboratory sessions will allow students to develop a structured operational approach to the technical and legal aspects of pharmacy practice by accurately accepting, processing, and checking prescriptions to meet a patient's needs, gathering pertinent patient information, and providing information to a patient about prescription medications or products available over-the-counter.

*Credits: 1*

*Every Spring*

### **PHM323 Pharmaceutics III: Biopharmaceutics and Pharmacokinetics**

A number of chemical biological and physical processes govern the in vivo fate of an administered medication. In order for a medication to be therapeutically useful it must enter the circulation (generally through an absorption process), distribute to the appropriate site of action and finally be eliminated by a chemical or physical process. This course is intended to provide the student with an understanding of the factors involved in these processes and to characterize drug disposition mathematically. In doing so, this course serves to supply the student with a fundamental background in pharmacokinetic principles. Following completion of this course, students will be able to determine the optimal dosage form for a

specific situation, determine an appropriate dosage regimen, counsel patients more appropriately and monitor patients as well. The tools and principles gained from this course will be used in the practice of pharmaceutical care.

*Credits: 3*

*Every Spring*

### **PHM324 Biostatistics**

Statistics plays a vital role in almost all branches of sciences, including pharmaceutical science and clinical science. Statistical methods are commonly used for analyzing clinical results, testing their significance. In clinical research, researchers and practitioners need to compare the release time of different dosage forms, the pharmacological effects of two chemical or biological entities, the clinical performance of a new drug with a gold standard treatment, the risk of adverse effects between different racial groups, the odds of receiving generic medications between private-insured patients and Medicaid patients, etc. Statistics help researchers and decision makers to identify real effects and differences by chance. With sound knowledge of statistics, pharmacists can carry out simple statistical test and interpret clinical studies correctly. Making decisions based upon evidence requires that students can understand, explain and apply descriptive and inferential statistics used in scientific research.

After completing the course students will be able to select the appropriate statistical procedure to answer research questions and explain why they made that decision based upon the scale of their outcomes variables and research questions. They will be able to use a computer statistical package, SPSS, Statistical Package for the Social Sciences, in solving problems and interpreting output. They will be able to explain what the results of the statistical tests mean and explain their decisions.

*Credits: 2*

*Every Spring*

### **PHM325 Introduction to Pharmacy Practice**

This course is designed to introduce the entry-level student to the concepts and skills that serve as the foundation for delivering patient-centered pharmacy care. As such, this course will prepare students for higher-level courses (such as the Modular Organ Systems Therapeutics Sequence and Drug Information and Literature Evaluation). The course begins with an overview of evidence-based medicine and information resources available to the practicing pharmacist. It continues with an in-depth review of laboratory tests commonly used when monitoring a patient. Students are later introduced to various diagnostic procedures and devices that may be seen in practice, components of a medical record, principles of adverse drug reactions and drug interactions, and the concepts of therapeutic drug monitoring, medication reconciliation, and documentation used in the provision of direct patient care services. The course concludes with a discussion of principles related to

self-care and complementary and alternative medicine, including assessment of a patient seeking nonprescription medications. Recitation sessions provide the students with an opportunity to meet in small groups as well as individually in order to use various active learning techniques to apply concepts discussed during lecture.

Following completion of this course students will be able to select the appropriate drug information reference to answer a specific question, extract pertinent information within a medical record and interpret the findings (e.g., laboratory test results), describe the principles of drug interactions and adverse drug reactions, prepare rudimentary pharmaceutical care plans and FARM notes, and assess whether a patient is an appropriate self-care candidate.

*Credits: 3*

*Every Spring*

### **PHM326 Principles of Physical Assessment and Medication Administration**

This course covers topics fundamental to patient care including the provision of collaborative drug therapy management, pharmacists as immunizers, and other expanded patient-care roles that pharmacists play in today's health care system. An emphasis is placed on the skills required to engage in medication therapy management services. These skills include the collection of objective data such as is required during physical assessment for therapeutic monitoring, screening for drug induced diseases, the evaluation of adverse events, and the administration of pharmaceuticals and vaccines. Laboratory sessions provide students with an opportunity to work individually and in small groups to engage in simulated performances of physical assessment and medication administration. After completing the lecture and skills laboratory components of this course the student will be able to obtain medical histories, screen patients for common medical problems such as hypertension, diabetes and a variety of oncological disorders, detect adverse drug reactions and monitor a patient's therapies through a review of systems and physical examination. Students will also become familiar with administering intramuscular and subcutaneous injections and counseling patients on the correct technique for administration of ophthalmological and otic preparations, inhaler devices, and devices for nebulization.

*Credits: 2*

*Every Spring*

### **PHM400 Community Practice Introductory Pharmacy Practice Experience**

This introductory experience course will expose the student to the patient care, administrative, distributive, and overall practice of a contemporary community pharmacy. The student pharmacist will observe and participate with pharmacists, perhaps other pharmacy students, and other health care professionals in providing direct patient care. The student will become familiar with key elements

involved with dispensing prescriptions (such as interpreting a patient profile, taking an oral prescription, preparing a product label, and counseling a patient, in order to assist the pharmacist in dispensing prescriptions. The student pharmacist also will observe/participate in assisting patients to select nonprescription agents, monitoring devices, and durable medical equipment. Finally, the student will gain experience in developing care plans for ambulatory patients.

*Credits: 4*

*Every Summer*

### **PHM401 Acute Care Introductory Pharmacy Practice Experience**

This Introductory Pharmacy Practice Experience, IPPE, will provide the student with his or her first opportunity to provide direct patient care in a hospital/medical center. Utilizing the knowledge and skills learned in the curriculum to date, the student pharmacist will observe (to a small degree) and participate with pharmacists, other student pharmacists, perhaps pharmacy residents, and other health care professionals/students in providing patient care to the extent permitted by law and the student's level of expertise. During this IPPE, the student will develop care plans, participate in clinical rounds with a medical team, and interact with patients. Direct patient care activities will include taking medication histories and/or providing patient counseling under the supervision of a pharmacist preceptor. The student will have ample opportunity to perform interventions that are meaningful and valuable to the health care team and patients while becoming familiar with the role of the hospital pharmacist. Opportunity might exist for the student to participate in a special project.

*Credits: 1*

*Every Fall and Spring*

### **PHM410 Human Genetics**

The goal of this course is to ensure that students acquire the fundamental knowledge and, to a limited extent, the skills that will be used in higher-level courses (such as the MOST series) to provide individualized pharmacotherapy for patients. Students will be able to apply various genetic and genomic tools in their patient practice. The course covers the historical developments that led to the era of genetics and genomics, and the fundamental principles of inheritance (DNA, genes, and chromosomes). Topics include the following: the human genome, mutations and polymorphisms, and mitochondrial genetics; gene interactions, multiple-factor inheritance and chromosomal inheritance; concepts and methodologies in genetic analysis. The roles of mutation, selection, and migration are investigated to determine the genetic composition of different populations, as well as discussions of simple vs. complex traits, cloning, DNA sequencing, and genetic and physical mapping. Throughout the course, students will be developing critical thinking, problem solving, and life-long learning skills needed in pharmacy practice

through the use of various active learning strategies such as concept maps.

Upon completion of this course, students will be able to describe the principles of inheritance and the role of polymorphisms in human diseases, and will be able to apply the concept of genetically determined populations to most aspects of pharmacotherapeutics in order to provide patient-specific care.

*Credits: 2*

*Every Fall*

### **PHM411 Modular Organ Systems Therapeutics Sequence (MOST I)**

This is the first of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and, eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

The first course in the sequence includes discussion of common anemias, fluid and electrolyte abnormalities, renal failure, and acid base disorders.

*Credits: 3*

*Every Fall*

### **PHM412 Modular Organ Systems Therapeutics Sequence (MOST II)**

This is the second of a 9-course sequence combines

the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and, eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

This course focuses on cardiovascular disorders and their rational treatment.

*Credits: 3*

*Every Fall*

**PHM413 Modular Organ Systems Therapeutics Sequence (MOST III)**

This is the third of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and, eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

This course focuses on hypothalamic and pituitary disorders, diabetes mellitus, thyroid disorders, osteoporosis, and female health.

*Credits: 2.50*

*Every Fall*

**PHM414 Drug Information and Literature Evaluation**

This course is designed to introduce students to the concepts involved in responding to drug information requests including, analysis of the question, conducting a systematic search, and formulating and communicating a response. A significant portion of the course will focus on ways to evaluate the biomedical literature with respect to trial design, methodology, statistical analysis of results, and clinical relevance of findings. The course concludes with clinical applications of drug information skills that require students to judge the merit of various types of biomedical literature so as to arrive at an evidence-based pharmacotherapy decision. The critical thinking and problem solving skills of students will be developed as they are challenged with various active-learning strategies in lecture and recitation/small-group learning sessions that focus on the application of drug information and literature evaluation skills in the delivery of patient-focused care.

After completing this course students will be able to retrieve, analyze, and interpret the professional, lay, and scientific literature to provide drug information and counseling to patients, their families or care givers, as well as other health care providers.

*Credits: 3*

*Every Fall*

**PHM420 Principles of Health Behavior and Patient-provider Communication**

To deliver pharmaceutical care effectively, pharmacists need to understand patient behaviors

and communicate with patients and other members of the health care professionals through different modalities, e.g., verbal, written, graphic, and electronic. In order to conform to OBRA '90 (federal regulation that has implications for pharmacists), and more recent regulations regarding pharmacy practice, requiring consultation with patients in a variety of specific situations, pharmacists must also possess the ability to address (both in writing and verbally) patients, community, senior, educational and religious groups who desire medication and health information, as well as share information, ideas and solutions with other pharmacists and health professionals. This course is designed to help students achieve competencies in the areas of understanding, influencing and modifying patient behaviors, effective verbal and written communication and engaging in professional behaviors that help improve patient quality of life and patient safety. This course is also the designated Writing Intensive (WI) course and involves students writing and presenting papers on topics related to effect of patient-provider communication on patient health outcomes.

Recitation sessions provide the students with an opportunity to counsel patients while utilizing sound principles of communicating with patients in a variety of context. The recitation periods allow the students to enhance their communication and patient management skills by conducting one-on-one counseling sessions and get feedback from peers.

Following completion of this course, students will be able to effectively communicate (written and oral) and create patient care plans for improving compliance and healthy behaviors.

*Credits: 3*

*Every Spring*

**PHM421 Pharmaceutics IV: Dosage Forms and Principles of Extemporaneous Compounding**

An important component of drug therapy is the selection of the dosage form. Some of the factors considered in the selection process include patient factors, (e.g., age, weight, gender), the route of administration, design of the dosage form, socio-economic factors, concurrent drug administration, and disease state. This course deals with the basic and applied scientific principles used in the design, preparation, storage, packaging, stability, incompatibilities, dispensing and use of polyphasic systems, including suspensions, and emulsions, of sterile parenteral, otic and nasal products and of total parenteral nutrition are necessary considerations of dosage form selection.

The laboratory component emphasizes the interpretation and dispensing of prescriptions and medication orders, and extemporaneous compounding of liquid dosage forms. Special emphasis is given to sterile product preparations including IV and TPN.

Following completion of this course, students will be able to interpret prescription orders, perform all calculations necessary for the compounding of

prescriptions, and compounding the prescription.

*Credits: 3*

*Every Spring*

#### **PHM422 Compounding Laboratory I**

This is the first of a two course sequence consisting of two to three hour laboratories of hands-on practice in compounding prescriptions of products not commercially available. Students will gain expertise in compounding extemporaneous dosage forms such as syrups, elixirs, emulsions, suspensions, lotions ophthalmic and nasal solutions, intravenous preparations and TPN preparations. The course also introduces the students to the concepts of home infusion therapy and gives them an opportunity to practice preparing total parenteral nutrition admixtures. The objective of the course is to provide pharmacy students with a unique opportunity to become competent in preparing extemporaneous products and to practice their chosen time-honored profession. As compounding pharmacy continues to grow, it will provide additional pharmacists with the opportunity to use their innovative skills to solve patient problems. Laboratory hours will ensure that students properly interpret prescriptions, and employ actives and excipients that are appropriate for any given dosage form. The course will allow students to become cognizant of the quality of drugs, excipients and other additives in terms of their stability, compatibility and, when necessary, sterility. Students will be fully exposed and competent in the compounding techniques commensurate to the complexities of 21st century compounding.

*Credits: 1*

*Every Spring*

#### **PHM423 Pharmacy Practice Laboratory I**

This is the first of a two-part laboratory sequence that will provide students with the opportunity to apply information and skills learned in prior coursework in a simulated patient-oriented pharmacy practice setting. Students will gain ample practice in the prescription dispensing process, such as accepting a prescription, reviewing it along with the patient profile for potential medication errors, processing the prescription, preparing/compounding the medication, checking the final product, and ultimately counseling the patient. Additionally, students will practice other activities that occur on a day-to-day basis in a typical pharmacy, such as communicating with health-care professionals to resolve issues, performing basic patient assessment, counseling patients on over-the-counter products and durable medical equipment, and managing inventory and staff.

*Credits: 1*

*Every Spring*

#### **PHM424 Modular Organ Systems Therapeutics Sequence (MOST IV)**

This is the fourth of a 9-course sequence combines the disciplines of pharmacology, medicinal

chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and, eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

This course focuses on gastrointestinal disorders, cough/cold/allergy, asthma and chronic obstructive pulmonary disease, and behavioral aspects of smoking cessation.

*Credits: 2.50*

*Every Spring*

#### **PHM425 Modular Organ Systems Therapeutics Sequence (MOST V)**

This is the fifth of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and,

eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

This course focuses on sleeping disorders, seizure disorders, alcohol and drug abuse, psychiatric disorders, Alzheimer's disease, and Parkinson's Disease.

*Credits: 3.50*

*Every Spring*

#### **PHM500 Institutional Practice Introductory Pharmacy Practice Experience**

This Introductory Pharmacy Practice Experience, IPPE, will provide the student with his or her first opportunity to practice pharmacy in a hospital/medical center setting. Utilizing the knowledge and skills obtained in the didactic and laboratory setting at the College, the student pharmacist will participate in the drug distribution aspects of a contemporary institution and may be given the opportunity to participate in administrative projects pertaining to managing a hospital pharmacy. Specifically, the student will participate in the unit dose distribution system (using manual and/or a robotic system), prepare intravenous admixtures, respond to queries posed by health care professionals, utilize the patient profile and other computerized systems in the hospital/medical center, perform interventions, and become familiar with policies and procedures unique to hospital practice. The student may have an opportunity to attend hospital or department meetings, and get involved in hospital projects such as nursing unit inspections and medication utilization reviews.

*Credits: 4*

*Every Summer*

#### **PHM510 Health Care Informatics**

Informatics is commonly defined as the use of computers to manage data and information. Medical informatics, also known as health

informatics, is a more specific application of these tools and techniques toward endeavors related to the infrastructure, development and delivery of optimal healthcare. Pharmacy informatics is the nexus between improving the medication use process through informatics, and this topic has taken on unprecedented importance in today's contemporary pharmacy practice. Taken together, we come up with the term health care informatics. Thus it is important that pharmacy students possess and conceptualize within the framework of the medication use process the knowledge and skills of healthcare informatics.

This course will provide a primer on the use of automation systems (e.g., electronic health records, robotics) that support the medication use process. Students will gain an understanding of how biomedical data are acquired, stored and used, as well as the ethical considerations that accompany this process. An emphasis will be placed on the role of informatics in assisting clinicians in assuring, through decision support technologies, optimal medication use and quality.

Students will develop their critical thinking and problem solving skills as they engage in active learning exercises designed to prepare them for developing, evaluating, using, and maintaining health care information systems.

*Credits: 2*  
*Every Fall*

**PHM511 Pharmaceutics V: Dosage Forms and Principles of Extemporaneous Compounding**

An important component of drug therapy is the selection of the dosage form. Some of the factors considered in the selection process include patient factors, (e.g., age, weight, gender), the route of administration, the design of the dosage form, socio-economic factors, concurrent drug administration, and the disease state. The course deals with the basic and applied scientific principles used in the design, preparation, storage, packaging, stability, incompatibilities, dispensing and use of polyphasic systems, including dermal and transdermal products, powders and granules, capsules, tablets, suppositories, metered dose aerosols, dry powder inhalers, nebulizers, rate-controlled and targeted drug delivery systems, and biotechnology and new drug delivery systems are necessary considerations of dosage form selection. The laboratory component emphasizes the interpretation and dispensing of prescriptions and medication orders, and extemporaneous compounding of semi solid and solid dosage forms. Special emphasis is given to sterile product preparations including IV and TPN. Following completion of this course, students will be able to interpret prescription orders, perform all calculations necessary for the compounding of prescriptions, and compounding the prescription.

*Credits: 3*  
*Every Fall*

**PHM512 Compounding Laboratory II**

This is the second of a two course sequence consisting of two to three hour laboratories of hands-on practice in compounding prescriptions of products not commercially available. Students will gain expertise in compounding extemporaneous dosage forms such as syrups, elixirs, emulsions, suspensions, lotions ophthalmic and nasal solutions, intravenous preparations and TPN preparations. The course also introduces the students to the concepts of home infusion therapy and gives them an opportunity to practice preparing total parenteral nutrition admixtures. The objective of the course is to provide pharmacy students with a unique opportunity to become competent in preparing extemporaneous products and to practice their chosen time-honored profession. As compounding pharmacy continues to grow, it will provide additional pharmacists with the opportunity to use their innovative skills to solve patient problems. Laboratory hours will ensure that students properly interpret prescriptions, and employ actives and excipients that are appropriate for any given dosage form. The course will allow students to become cognizant of the quality of drugs, excipients and other additives in terms of their stability, compatibility and, when necessary, sterility. Students will be fully exposed and competent in the compounding techniques commensurate to the complexities of 21st century compounding.

*Credits: 1*  
*Every Fall*

**PHM 513 Pharmacy Practice Laboratory II**

This two-part laboratory sequence will provide students with the opportunity to apply information and skills learned in prior coursework in a simulated patient-oriented pharmacy practice setting. Students will gain ample practice in the prescription dispensing process, such as accepting a prescription, reviewing it along with the patient profile for potential medication errors, processing the prescription, preparing/compounding the medication, checking the final product, and ultimately counseling the patient.

*Credits: 1*  
*Every Fall*

**PHM514 Practical Applications of the Biological Sciences**

The biological sciences recitation combines the disciplines of pathophysiology, biochemistry, molecular biology, genetics, and the principles of medicinal chemistry/pharmacology/toxicology to provide students with an integrated approach to understanding the physiological, biochemical, and molecular mechanisms of disease and inheritance, as well as the therapeutic and toxic effects of medications on the human body. By working in teams and individually, students will utilize a variety of active learning strategies such as evaluating case studies, developing concept maps, and debating a variety of issues to solve complex problems, hone

their skills and enhance their critical thinking, problem solving, and life-long learning skills. Following completion of these recitations, students will be able to apply knowledge acquired in the basic sciences to direct patient care.

*Credits: 1*  
*Every Fall*

**PHM515 Pharmacoeconomics and Pharmacoepidemiology**

In the past decade, pharmacists have come to be known as the medication experts of the health care system. Pharmacoepidemiology and pharmacoeconomics are research fields that address the effects of medication use in populations. Naturally, it is expected that pharmacists have the requisite knowledge of the principles of pharmacoepidemiology and pharmacoeconomics. This course is designed to teach students about the different study designs and ratios used in different pharmacoepidemiology studies, confounders and biases affecting these studies and their results and how to conduct high-quality epidemiologic research that directly addresses both methodological and substantive questions. Students will also gain an understanding and expertise in utilizing various pharmacoeconomic formulas and ratios to make decisions about which drugs to be included in the formulary. Active learning strategies will be utilized. Following completion of this course, students will be able to critically evaluate pharmacoepidemiological and pharmacoeconomic studies and make decisions about adapting the results of these studies in their practice. Students will be able to calculate ratios utilized in pharmacoepidemiological and pharmacoeconomic studies and provide recommendations related to medication use in populations.

*Credits: 2*  
*Every Fall*

**PHM516 Modular Organ Systems Therapeutics Sequence (MOST VI)**

This is the sixth of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and, eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps,

and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

This course focuses on infectious diseases.

*Credits: 2.50*

*Every Fall*

#### **PHM 517 Modular Organ Systems Therapeutics Sequence (MOST VII)**

This is the seventh of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development. Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

*Credits: 2.50*

*Every Fall*

#### **PHM521 Practice Management**

The healthcare system in the United States is changing rapidly. Pharmacists and their role in the healthcare system are at the epicenter of this change. Thus, it is imperative that future pharmacists learn how to handle the change in this rapidly evolving healthcare system. This course will help students acquire knowledge and skills required to excel in the areas of entrepreneurship, resource management, and business operations pertaining to pharmacy practice and change management. Principles from the managerial sciences such as business management, human resource management etc., will be applied to pharmacy business operations and patient care services. Emphasis is placed on the use of active learning strategies rather than passive listening and will require students to write mission and vision statements, create business plans, conduct SWOT Analysis, develop staffing plans and tools and analyze financial reports.

At the end of the course, students will be able to develop plans for financially sound patient care services, identify staffing requirements and apply human resource management tools to resolve issues, and conduct an in-depth analysis of the financial viability of a pharmacy business.

*Credits: 2*

*Every Spring*

#### **PHM522 Public Health and Patient Safety**

Increasingly, members of the health professions, health policymakers and the American public appreciate the importance of disease prevention and improvement of population health. The release of the document, Healthy People 2010 and national events such as the September 11 attack and the hurricane Katrina disaster have brought to public attention the need for a network of different health care professionals who can effectively respond to public health threats and improve population health. Pharmacists are one of the most accessible health care professionals to the public and therefore, can significantly affect population health. Therefore, in addition to their conventional role of delivering optimal pharmacotherapy to individual patients, it is important for pharmacists to develop skills to become effective public health providers and improve population health. The role of the pharmacist in public health is to be able to assess the health needs of populations and to promote health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk populations and other members of an interprofessional team of health care providers. At the completion of this course, students will be able to design and evaluate initiatives to promote public health such as: (1) improve access to health care and reduce health disparities, (2) increase the quality of community based programs, (3) use communication strategies to improve health, (4) ensure the safe and effective use of medical products, (5) promote health and

reduce chronic disease associated with diet and weight, (6) improve health, fitness and quality of life through promoting daily physical activity, (7) reduce substance abuse, and (8) reduce illness, disability and death related to tobacco use and exposure to secondhand smoke. Additionally, students will be trained in improving patient safety using a systems perspective. Students will be introduced to error reporting systems and techniques to identify, categorize and reduce medication errors.

The course includes lectures as well as recitation sessions. During the recitation, students will work on designing, implementing and evaluating a community based public health program.

*Credits: 3*

*Every Semester*

#### **PHM523 Pharmacogenomics**

This course exposes students to the genetic basis of diseases as related to mechanisms of action/toxicities, and inter-individual differences in response to medications and drugs. The focus is on personalized medicine and is based on molecular markers of diseases, medication effectiveness, and adverse events. An emphasis is placed on the most important genetic and genomic technologies involved in genotyping drug metabolizing enzymes, transporters, and other targets. Students are given opportunities to review and discuss current case studies of pharmacogenomics and individual variations in response to medications and drugs. The course ends with a discussion of ethical issues involving genetic testing, patient stratification and clinical trials, and the role of the FDA in pharmacogenomics and personalized medicine. The course consists of lectures and student-led case discussions. Throughout the course, students will be developing critical thinking, problem solving, and life-long learning skills needed in pharmacy practice.

Upon completion of this course, students will be able to describe the major genetic determinants involved in human diseases and their relation to variations in response to medications/drugs. Students also will be able to apply the concept of genetically determined populations to most aspects of pharmacotherapeutics, and will have the knowledge to educate other health care professionals and patients about the availability and importance of genetic testing in order to provide personalized patient care.

*Credits: 2*

*Every Spring*

#### **PHM524 Clinical Pharmacokinetics**

Clinical pharmacokinetics is the process of using drug concentrations, pharmacokinetic principles, and pharmacodynamics criteria to personalize drug therapy. Class time includes traditional lectures coupled with active learning exercises (e.g. case studies).

Following the completion of this course, students will be able to describe the way in which the

pharmacokinetics of certain medications may be altered in specific patient populations (e.g., geriatrics, patients with renal or hepatic impairment). Students will also be able to describe the pharmacokinetics of specific medications (e.g., antiepileptics) their usual therapeutic concentration range, the relationships between concentration and pharmacodynamics effects, and factors affecting these relationships. Using knowledge regarding the pharmacokinetic characteristics of each medication, students will be able to individualize therapy for a given patient.

*Credits: 2*

*Every Spring*

**PHM525 Pharmacy Law and Ethics**

Like all professionals, pharmacists can be held legally accountable for the consequences of their personal conduct while providing care to their patients. This course is designed to provide students with an insight into the legal aspects of their practice. Students will be introduced to federal and state laws, statutes and professional ethics chartered by pharmacy professional associations. The course will cover both federal and state laws that impact and regulate the practice of pharmacy. Topics including the federal regulation of medications, regulation of controlled substances, and federal and state regulation of pharmacy practice will be discussed using case studies. Detailed evaluation of the New York State laws and the relevant federal regulations pertaining to pharmacy may help the students in preparing for their Multistate Pharmacy Jurisprudence Exam (MPJE), and in understanding the diverse legal issues impacting future professional practice. Using an active learning strategy, students will be asked to critically think and provide rational and moral arguments on issues that pose legal, ethical and moral challenges.

Following completion of this course, students will be able to distinguish between moral, ethical and legal behaviors, construct arguments on issues pertaining to legal and ethical conduct in pharmacy practice, and demonstrate a working knowledge of laws under which pharmacists and pharmacies operate.

*Credits: 3*

*Every Spring*

**PHM 528 Modular Organ Systems Therapeutics Sequence (MOST VIII)**

This is the eighth of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. Recitation sessions provide the students with an opportunity to meet in small

groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development. Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

*Credits: 3.50*

*Every Spring*

**PHM529 Modular Organ Systems Therapeutics Sequence (MOST IX)**

This is the ninth of a 9-course sequence combines the disciplines of pharmacology, medicinal chemistry, and pharmacotherapy in order to provide the student with an integrated approach to understanding the molecular mechanisms of drug action, the effects of medications on the body, and rational therapeutic approaches to important disease states. An emphasis is placed on the most common conditions for which pharmacists and student pharmacists are exposed to when providing patient care. In general, the students learn pharmacologic principles first and then learn rational pharmacotherapeutics. Throughout the sequence, students will be developing their critical thinking and problem-solving skills so that they are well prepared for experiential education and, eventually, pharmacy practice.

Recitation sessions provide the students with an opportunity to meet in small groups in order to use various active learning techniques such as evaluating case studies, developing concept maps, and debating a variety of issues. The recitation periods allow the students to enhance their skills working with other student health care professionals to solve complex problems while still allowing ample opportunity for individual work and development.

Following completion of these courses, students will be able to describe the chemical basis of drug metabolism, structure activity relationships, and the reasons that medications may cause adverse events in patients. Students will be able to identify the appropriate prescription or nonprescription medication to use in a specific situation, and will be able to make recommendations to other health care professionals as well as patients about these therapies. Overall, students will be able to utilize pharmacologic, pathophysiologic, and

pharmacotherapeutic principles in order to formulate patient care plans and provide patient-focused care.

The final course in the MOST series, a potpourri of topics are covered such as glaucoma, an introduction to geriatrics, veterinary medicine, enteral and parenteral nutrition, and managing the patient with hypovolemic and septic shock.

*Credits: 3*

*Every Spring*

**PHM 610 Acute Care Advanced Pharmacy Practice Experience**

This Advanced Pharmacy Practice Experience may take place on any service in a hospital or medical center – including internal medicine, emergency medicine, pediatrics, infectious diseases, and critical care. Students participate in interdisciplinary team rounds and are responsible for developing patient-specific care plans, meeting the drug information needs of the other members of the team, and interacting with patients.

*Credits: 5*

*Every Fall, Spring and Summer*

**PHM 611 Ambulatory Care Advanced Pharmacy Practice Experience**

Students practice alongside prescribers and other health care professionals to provide direct patient care in an ambulatory environment – usually a hospital clinic. Students participate in the decision-making process at the point that a medication is selected and are then charged with implementing practices that will enhance adherence to the agreed-upon regimen. Communicating with patients is emphasized in this experience.

*Credits: 5*

*Every Fall, Spring and Summer*

**PHM 612 Community Practice Advanced Pharmacy Practice Experience**

Students are asked to provide direct patient care in a community pharmacy setting. Students are expected to dispense medications under the supervision of a pharmacist and to intervene with prescribers when the situation arises. Students also become competent in recommending nonprescription and alternative therapies, and spend considerable time counseling patients. Students are involved with key administrative duties such as maintaining records and interacting with pharmacists and support personnel.

*Credits: 5*

*Every Fall, Spring and Summer*

**PHM 613 Institutional Practice Advanced Pharmacy Practice Experience**

Students are exposed to all elements of a modern hospital medication distribution system, and the policies, procedures, and committee structure required in an institutional setting. Students are expected to be involved with various institutional committees and participate in administrative assignments. Students provide patient-specific interventions and hone their skills in

communicating with other health care professionals including nurses and physicians.

*Credits: 5*

*Every Fall, Spring and Summer*

**PHM 614 Internal Medicine Advanced Pharmacy Practice Experience**

This Advanced Pharmacy Practice Experience takes place in a hospital or medical center. During this experience, student pharmacists participate on interdisciplinary medical rounds and contribute to the provision of patient care. Students are expected to enhance their critical thinking and problem-solving skills by resolving drug-related problems and by selecting the most appropriate therapy for a given patient care situation. Students also develop care plans, prepare notes suitable for inclusion in a medical record, provide drug information to other members of the health care team, and counsel patients.

*Credits: 5*

*Every Fall, Spring and Summer*

**PHM 615 Senior Seminar**

Attendance at live convocations and participation in distance learning throughout the academic year is required. Subject matter is topical and timely.

*Credits: 0*

*Every Fall, Spring and Summer*

## PROFESSIONAL COURSE DESCRIPTIONS

### For Students Beginning the Professional Phase Prior to Fall 2015.

#### PH 1 Pharmacy Orientation Seminar

This course is designed as an introduction for the preprofessional student to the possibilities and processes of professional life in pharmacy. Utilizing a social/historical approach, the seminar provides a survey of the development of pharmacy practice since the emergence of scientific medicine through the current pharmaceutical-care movement. Pharmacy's position in the socioeconomic and cultural framework of healthcare delivery is defined through an exploration of the major societal, political, philosophical, economic and ethical issues affecting the profession. The various roles and career pathways of pharmacists within this framework are examined. The seminar also provides a support system for the preprofessional student and a source of information about the requirements, responsibilities and attitudes necessary for success in the professional phase of the program. After completing this course, the student will be able to cogently discuss the basic philosophy and goals of pharmaceutical care and to formulate soundly based positions on major issues affecting the profession of pharmacy. Additionally, the student will be able to initiate informed and rational decisions about potential career goals. One lecture hour.

*In order to register for PH 1 the student must be a Pharmacy major.*

*Credits: 1*

*Every Fall and Spring*

#### PH 100 Pharmaceutical Care/Health Care

Students will learn how various healthcare professionals interact to provide care in hospitals, long-term care facilities, ambulatory and managed-care institutions. Students will learn the role of government as payer and provider of healthcare, the effect of managed-care systems on quality and access to health care, and the mechanisms by which health policy is formulated, and apply this knowledge to explain the roles of pharmacists in providing pharmaceutical care to patients. After completing this course, the student will have developed a foundation for applying knowledge in the pharmaceutical and clinical sciences to the provision of patient-focused care. Three lecture hours and periodic site visits.

*The pre-requisites or co-requisites of PH 101, 120, 130 and 131 are required as well as being a Third year Pharmacy major.*

*Credits: 3*

*Every Fall*

#### PH 101 Social and Behavioral Aspects of Pharmaceutical Care/Ethics

This course surveys the behavioral and social aspects of pharmaceutical care such as the health-belief model, psychosocial aspects of illness, including illness behavior, psychosociological aspects of the use of pharmaceuticals, compliance behavior, and the cultural constructs of professionalism and the professionalization of pharmacists. Additionally, this course examines value judgments in the provision of pharmaceutical care. Utilitarian, rights-based, and other major ethical approaches are considered in relation to such topics as patients' rights, truth-telling, informed consent, and the right to health care. After completing this course students should be able to demonstrate sensitivity to and facility with personal and societal values, beliefs and ethical principles in the interpersonal and decision-making processes associated with the provision of pharmaceutical care to culturally diverse populations. Two lecture hours and one recitation hour.

*The pre-requisites or co-requisites of PH 100, 120, 130 and 131 are required as well as being a Third year Pharmacy major.*

*Credits: 2*

*Every Fall*

#### PH 102 Public Health in Pharmacy Practice

The role of the pharmacist in Public Health is to be able to assess the health needs of populations and to promote health improvement, wellness and disease prevention in cooperation with patients, communities, at-risk populations and other members of an interprofessional team of health care providers. At the completion of this course, students should be able to design and evaluate initiatives to promote public health such as: (1) improve access to health care and reduce health disparities, (2) increase the quality of community-based programs, (3) use communication strategies to improve health, (4) ensure the safe and effective use of medical products, (5) promote health and reduce chronic diseases associated with diet and weight, (6) improve health, fitness and quality of life through promoting daily physical activity, (7) reduce substance abuse, and (8) reduce illness, disability and death related to tobacco use and exposure to secondhand smoke.

*The pre-requisites of PH 100 and 101 are required. The co-requisite of PH 102R is required.*

*Credits: 3*

*Every Spring*

#### PH 111 Pharmacotherapeutics I

This is the first course in the pharmacotherapeutics series. It is designed to introduce the entry-level student to the therapeutic aspects of pharmaceutical care. Students will also be introduced to standard and specialized biomedical resources including computerized databases, textbooks, indexing systems, the Internet, and

primary literature. After completing this course, this student will be able to do the following: use a medical record to find pertinent information needed to develop a pharmaceutical care plan, describe the most important laboratory tests needed to monitor a patient with a given disease state or to monitor a patient receiving a given medication, differentiate among the various routes of drug administration, and delineate the principles of drug interactions and adverse drug reactions. In addition, the student will demonstrate proficiency in conducting an information search and in critical-thinking skills via the evaluation of case-study scenarios during recitation periods. Four lecture hours and one recitation hour.

*The pre-requisite of PH 130 is required.*

*The co-requisite of PH 111R is required.*

*Credits: 4*

*Every Spring*

#### PH 120 Pharmaceutics I

This course is designed to enable students to perform calculations requisite to the practice of pharmacy. The student will learn to interpret prescription orders, and perform all calculations necessary for the compounding of prescriptions. The course is taught using a series of problem sets and includes, but is not limited to, the following: pharmaceutical units and conversions; calculation of errors; calculation of doses; using concentration terms of diluting (or concentrating) stock solutions; manufacturing isotonic solutions; calculations involving parenteral solutions and rudiments of statistics and data interpretation. Three lecture hours.

*The pre-requisites or co-requisites of PH 100, 101, 130 and 131 are required as well as being a Third year Pharmacy major.*

*Credits: 3*

*Every Fall*

#### PH 121 Pharmaceutics II

(This is the first course in a three-course sequence in pharmaceutics) In this sequence of courses students will use basic and applied scientific principles to design, optimize and prepare pharmaceutical dosage forms. In Pharmaceutics II, topics include the discussion of states of matter, thermodynamics, kinetics, solution theory, diffusion and dissolution principles, and rheology. The application of these subject areas to the preparation of liquid dosage forms will also be discussed. In Pharmaceutics III the principles of biopharmaceutics and bioavailability, interfacial phenomena, and coarse dispersions will be discussed and applied to the design of polyphasic dispersions (suspensions, emulsions, magmas and gels), sterile preparations (parenterals, ophthalmics), and nasal and optic products. In Pharmaceutics IV the science, art and technology of dermal and transdermal products, powders and granules, capsules, tablets, suppositories and aerosols will be discussed. Additionally, rate-controlled and targeted drug-delivery systems and biotechnology drug

products will be discussed in Pharmaceutics IV. Laboratories in Pharmaceutics III and IV will stress all aspects of interpreting and dispensing prescriptions and medication orders pertaining to the dosage forms discussed in the courses. Students will perform necessary calculations, extemporaneously prepare products for pharmaceutical use, and simulate counseling patients and other healthcare professionals. Three lecture hours.

*The pre-requisite of PH 120 is required.*

*Credits: 3*

*Every Spring*

### **PH 130 Medical Physiology and Pathophysiology**

This course is designed to discuss the relationship of normal body functioning to the physiologic changes that participate in disease production, as well as the body's remarkable ability to compensate for these changes. A complete study of human physiology that integrates all aspects of the individual cells and organs of the human body into a functional whole will be presented. This information will provide the basis that can be used to explain the pathophysiological aspects of altered health. The content of this course will focus on the health-illness continuum: (1) control of normal body function; (2) pathophysiology, or alterations in body function; and (3) system or organ failure, regardless of pathologic state (e.g., heart failure and renal failure). The didactic material will emphasize the basics of organ system pathophysiology, "bridging" these concepts to pharmaceutical care through clinical case studies that strengthen the student's grasp of the scientific basis of disease. This course will lay the foundation for further advanced study in the basic health, clinical and pharmaceutical sciences. After completing this course, the student will be able to describe the various physiological mechanisms of disease processes which are vital for the drug use decision-making process. The student will acquire the scientific knowledge essential for the application of pharmaceutical care. Five lecture hours and one recitation hour.

*The pre-requisites or co-requisites of PH 100, 101, 120 and 131 are required as well as being a Third year Pharmacy major.*

*Credits: 5*

*Every Fall*

### **PH 131 Biochemical Foundations of Therapeutics**

This course is designed to provide the molecular and biochemical foundations necessary for understanding the basis of pharmacotherapeutics. The course involves the study of biomolecular interactions, macromolecular structure and functions, cellular catabolic and anabolic pathways, DNA metabolism, gene expression and biochemical bases of diseases. After completing this course, students will be able to apply biochemical principles that are requisite to the understanding of higher-level courses in medical microbiology, immunology, pharmacology and medicinal chemistry. Four

lecture hours.

*The pre-requisite or co-requisite of PH 100, 101, 120 and 130 are required as well as being a Third year Pharmacy major.*

*Credits: 4*

*Every Fall*

### **PH 132 Medical Microbiology/Immunology**

This course provides an in-depth study of the microbial world with emphasis on the nature and behavior of microorganisms, the interrelationships that operate between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease. Pathological and immunological changes induced by bacteria, viruses, fungi, parasites, helminths, chlamydiae, rickettsiae, mycoplasma, L-forms, and prions and the way these organisms are affected by antimicrobials will be discussed. Basic and advanced mechanisms involved in infection and immunity encompassing natural and induced modes of host defense will be emphasized. Topics in immunology will also include vaccination strategies, immune-related diseases and transplantation immunology. Biotechnology and the use of microorganisms in the production of biopharmaceuticals will be discussed. After completing this course students will be able to identify microorganisms and characterize the infectious disease process. Three lecture hours.

*The pre-requisites of PH 130, 131 are required.*

*Credits: 3*

*Every Spring*

### **PH 133 Pharmacology/Medicinal Chemistry I**

(This is the first course in a three-course sequence in pharmacology/medicinal chemistry.) The pharmacology/medicinal chemistry series of courses is an integrated approach to the understanding of the molecular mechanisms of drug action and their effects on the human body. Students will obtain expertise in the principles of drug action including receptor theory and membrane permeation, and will be introduced to basic pharmacokinetic principles. Following completion of the sequence, students will be able to explain and predict the chemical basis of drug metabolism and structure activity relationships. These courses will cover pharmacological agents, utilizing an integrated approach relating chemical structure to therapeutic and adverse effects. Students will be expected to understand the pharmacological activities of agents affecting the autonomic nervous system (cholinergic and adrenergic pharmacology), central nervous system (anesthetics, antipsychotics, antiepileptics, etc.), the cardiovascular system and hormonal systems. In addition, students will master the pharmacological and medicinal chemical properties of anticancer, anti-microbial and anti-viral agents. Recitations will provide students with an opportunity to meet in small groups to evaluate case studies and work problems. Students will develop problem-solving and critical thinking skills during the recitation sessions. The recitation

session in the second course of the sequence will be integrated with Pharmacotherapeutics II (PH 210). Four lecture hours and one recitation hour.

*The pre-requisites of PH 130, 131 are required.*

*Credits: 4*

*Every Spring*

### **PH 200 Communication Skills in Pharmaceutical Care**

Students will learn to apply basic communication skills, such as empathic listening, conflict management and assertiveness to affect, in a positive manner, their interprofessional relationships, the clinical, economic and humanistic outcomes of patients, the productivity of technical personnel, and their success as pharmacists. The course is divided into one hour of the lecture and one hour of recitation per week. The recitation component will consist of role playing, presentation, and writing exercises that will account for a significant portion of the course grade. After completing the course, the student will be able to apply knowledge from the pharmaceutical and clinical sciences in order to counsel patients regarding the use of their medications. One lecture hour and two recitation hours.

*The pre-requisite of PH 102 is required.*

*Credits: 2*

*Every Fall and Spring*

### **PH 201 Pharmacy Law and Ethics**

This course introduces the student to the legal environment of pharmacy specifically, national and New York State statutes, regulations and legal decisions. In addition, the course includes legal issues with ethical implications. After completing the course students will possess the knowledge, skills and integrity to practice pharmacy within accepted legal and professional standards of conduct, with a sense of service and responsibility to the community. Three lecture hours.

*The pre-requisite of PH 102 is required.*

*Credits: 3*

*Every Spring*

### **PH 210 Pharmacotherapeutics II**

(The first of four courses.) These four courses, the second, third, fourth and fifth courses in the pharmacotherapeutics series, stress the understanding of important disease states and rational therapeutics of these conditions. The disease states are presented with emphasis on developing critical thinking and problem-solving skills. After completing these courses, students will be able to utilize pathophysiologic, pharmacotherapeutic and pharmacoeconomic principles to formulate pharmaceutical care plans for patient management. Development of pharmaceutical care plans includes problem identification, data collection and evaluation, implementation of appropriate therapy, and monitoring patient outcomes. Case studies and problem-based learning will be incorporated

throughout the courses.

*The pre-requisites of PH 111 and 133 are required.*

*The co-requisite of PH 231 is required.*

*Credits: 4*

*Every Fall*

**PH 211 Physical Assessment and Drug Administration**

After completing the components of this course, students will be able to obtain medical histories; screen patients for common medical problems such as hypertension, diabetes and a variety of cancers; measure and evaluate vital signs; detect adverse drug reactions and monitor patients' therapies through a review of systems and physical examination. Students will also learn drug administration techniques and will become competent in administering intramuscular and subcutaneous injections in addition to eye and ear preparations, and medications via the use of inhalers and nebulizers. Various administration devices will also be reviewed and demonstrated. Students will be encouraged to complete their mandatory cardiopulmonary resuscitation module during this course. One lecture hour and two laboratory hours.

*The pre-requisite of PH 111 is required.*

*Credits: 2*

*Every Fall*

**PH 212 Pharmacotherapeutics III**

(The second of four courses.) These four courses, the second, third, fourth and fifth courses in the pharmacotherapeutics series, stress the understanding of important disease states and rational therapeutics of these conditions. The disease states are presented with emphasis on developing critical thinking and problem-solving skills. After completing these courses, students will be able to utilize pathophysiologic, pharmacotherapeutic and pharmacoeconomic principles to formulate pharmaceutical care plans for patient management. Development of pharmaceutical care plans includes problem identification, data collection and evaluation, implementation of appropriate therapy, and monitoring patient outcomes. Case studies and problem-based learning will be incorporated throughout the courses. Four lecture hours and one recitation hour.

*The pre-requisites of PH 111 and 230 are required.*

*The co-requisite of PH 212R is required.*

*Credits: 4*

*Every Spring*

**PH 220 Pharmaceutics III**

(This is the second course in a three-course sequence in pharmaceutics) In this sequence of courses students will use basic and applied scientific principles to design, optimize and prepare pharmaceutical dosage forms. In Pharmaceutics II, topics include the discussion of states of matter, thermodynamics, kinetics, solution theory, diffusion and dissolution principles, and rheology.

The application of these subject areas to the preparation of liquid dosage forms will also be discussed. In Pharmaceutics III the principles of biopharmaceutics and bioavailability, interfacial phenomena, and coarse dispersions will be discussed and applied to the design of polyphasic dispersions (suspensions, emulsions, magmas and gels), sterile preparations (parenterals, ophthalmics), and nasal and optic products. In Pharmaceutics IV the science, art and technology of dermal and transdermal products, powders and granules, capsules, tablets, suppositories and aerosols will be discussed. Additionally, rate-controlled and targeted drug-delivery systems and biotechnology drug products will be discussed in Pharmaceutics IV. Laboratories in Pharmaceutics III and IV will stress all aspects of interpreting and dispensing prescriptions and medication orders pertaining to the dosage forms discussed in the courses. Students will perform necessary calculations, extemporaneously prepare products for pharmaceutical use, and simulate counseling patients and other healthcare professionals. Three lecture hours and three laboratory hours.

*The pre-requisite of PH 121 is required.*

*Credits: 4*

*Every Fall*

**PH 221 Pharmaceutics IV**

(This is the third course in a three-course sequence in pharmaceutics) In this sequence of courses students will use basic and applied scientific principles to design, optimize and prepare pharmaceutical dosage forms. In Pharmaceutics II, topics include the discussion of states of matter, thermodynamics, kinetics, solution theory, diffusion and dissolution principles, and rheology. The application of these subject areas to the preparation of liquid dosage forms will also be discussed. In Pharmaceutics III the principles of biopharmaceutics and bioavailability, interfacial phenomena, and coarse dispersions will be discussed and applied to the design of polyphasic dispersions (suspensions, emulsions, magmas and gels), sterile preparations (parenterals, ophthalmics), and nasal and optic products. In Pharmaceutics IV the science, art and technology of dermal and transdermal products, powders and granules, capsules, tablets, suppositories and aerosols will be discussed. Additionally, rate-controlled and targeted drug-delivery systems and biotechnology drug products will be discussed in Pharmaceutics IV. Laboratories in Pharmaceutics III and IV will stress all aspects of interpreting and dispensing prescriptions and medication orders pertaining to the dosage forms discussed in the courses. Students will perform necessary calculations, extemporaneously prepare products for pharmaceutical use, and simulate counseling patients and other healthcare professionals. Three lecture hours and three laboratory hours.

*The pre-requisite of PH 220 is required.*

*The co-requisite of PH 221R is required.*

*Credits: 4*

*Every Spring*

**PH 230 Pharmacology/Medicinal Chemistry II**

(This is the second course in a three-course sequence in pharmacology/medicinal chemistry.) The pharmacology/medicinal chemistry series of courses is an integrated approach to the understanding of the molecular mechanisms of drug action and their effects on the human body. Students will obtain expertise in the principles of drug action including receptor theory and membrane permeation, and will be introduced to basic pharmacokinetic principles. Following completion of the sequence, students will be able to explain and predict the chemical basis of drug metabolism and structure activity relationships. These courses will cover pharmacological agents, utilizing an integrated approach relating chemical structure to therapeutic and adverse effects. Students will be expected to understand the pharmacological activities of agents affecting the autonomic nervous system (cholinergic and adrenergic pharmacology), central nervous system (anesthetics, antipsychotics, antiepileptics, etc.), the cardiovascular system and hormonal systems. In addition, students will master the pharmacological and medicinal chemical properties of anticancer, antimicrobial and anti-viral agents. Recitations will provide students with an opportunity to meet in small groups to evaluate case studies and work problems. Students will develop problem-solving and critical thinking skills during the recitation sessions. The recitation session in the second course of the sequence will be integrated with Pharmacotherapeutics II (PH 210). Four lecture hours.

*The pre-requisites of PH 132, 133 are required.*

*The co-requisite of PH 231 is required.*

*Credits: 4*

*Every Fall*

**PH 231 Pharmacology/Medicinal Chemistry II/Pharmacotherapeutics II Recitation**

Integrated recitation of Pharmacology/Medicinal Chemistry II (PH 230) and Pharmacotherapeutics II (PH 410). Required of all students taking either one or both courses. May be repeated.

*The co-requisites of PH 210 and 230 are required.*

*Credits: 0*

*Every Fall*

**PH 232 Pharmacology/Medicinal Chemistry III**

(This is the third course in a three-course sequence in pharmacology/medicinal chemistry.) The pharmacology/medicinal chemistry series of courses is an integrated approach to the understanding of the molecular mechanisms of drug action and their effects on the human body. Students will obtain expertise in the principles of drug action including receptor theory and membrane permeation, and will be introduced to basic pharmacokinetic principles. Following completion of the sequence, students will be able to explain and predict the chemical basis of drug metabolism and structure

activity relationships. These courses will cover pharmacological agents, utilizing an integrated approach relating chemical structure to therapeutic and adverse effects. Students will be expected to understand the pharmacological activities of agents affecting the autonomic nervous system (cholinergic and adrenergic pharmacology), central nervous system (anesthetics, antipsychotics, antiepileptics, etc.), the cardiovascular system and hormonal systems. In addition, students will master the pharmacological and medicinal chemical properties of anticancer, antimicrobial and anti-viral agents. Recitations will provide students with an opportunity to meet in small groups to evaluate case studies and work problems. Students will develop problem-solving and critical thinking skills during the recitation sessions.

*The pre-requisites of PH 132, 133 are required.*

*The co-requisite of PH 232R is required.*

*Credits: 3*

*Every Spring*

#### **PH 240 Introduction to Complementary and Alternative Medicine**

The course is an overview of micro and macro perspectives of alternative medicine. Students will search and evaluate information on alternative medicines and make cost/benefit decisions about the use of a particular alternative medicine for a patient, supporting their decision with evidence and evaluating the validity of the evidence. They will also evaluate the use of alternative medicines in a societal context from perspectives of the health professions, biological and behavioral sciences, business and industry, practitioners and users.

*The pre-requisite of PH 102 is required.*

*Credits: 3*

*On Occasion*

#### **PH 241 Pharmaceutical Marketing and Advertising Procedures**

The course will give students insight into the strategies and tactics employed in marketing pharmaceuticals to physicians, other healthcare professionals, and consumers.

*The pre-requisite of PH 102 is required.*

*Credits: 3*

*On Occasion*

#### **PH 250 Issues in Women's Health I**

The course is designed to develop the pharmacy student's competency in a number of key issues in healthcare for women, including conditions or diseases unique to women, more prevalent or more serious in women, or for which the risk factors or interventions are different for women. Differences due to healthcare considerations, including the availability, affordability and appropriateness of healthcare services for women will also be covered. The recitation sessions will provide the students with an opportunity for developing problem-solving and critical-thinking skills via the evaluation of case studies. Two lecture hours and one recitation hour.

*The pre-requisite of PH 102 is required.*

*Credits: 3*

*On Occasion*

#### **PH 260 Survey Design and Analysis for Pharmacist**

Surveys are a common tool in both market research and academic research projects. Learning how to develop and analyze surveys will help pharmacists from all sectors. This class will help students learn skills required to conduct survey based projects. Skills taught in this course will include: identifying specific survey objectives, designing surveys by utilizing good question writing principles, establishing a good research protocol to conduct the surveys, examining and improving psychometric properties of survey instruments and conducting analysis using data obtained from surveys.

*Credits: 3*

*On Occasion*

#### **PH 270 Pharmaceutical Biotechnology**

This course is designed to introduce students to the use of biotechnology and biotechnology-related techniques in the development of pharmacotherapeutic agents. It is aimed at students who are interested in an in-depth study of biotechnology-related products. Students will obtain expertise in the basic concepts of molecular biotechnology, the biochemical analysis of recombinant molecules, peptide chemistry and peptidomimetics (peptide drugs), antisense therapy, monoclonal antibody-based pharmaceuticals and the synthesis of cytokines (interferons, interleukins, etc.) and growth factors by recombinant techniques. After completing this course, students will be able to explain the procedures involved in the development of biotechnology-related pharmaceuticals and be familiar with the spectrum of pharmacotherapeutic agents that are produced using biotechnology and biotechnology-related techniques. The course will involve the use of problem-based learning, video presentations and experimental demonstrations to reinforce key concepts about the preparation and applications of biotechnology-derived products in the treatment of serious diseases.

*The pre-requisites of PH 130 and 131 are required.*

*Credits: 3*

*On Occasion*

#### **PH 271 Advanced Medical Microbiology**

A combination of laboratory principles along with some of the modern methodologies will be emphasized in this curriculum. The primary goal will be to expose students to these avenues from a practical angle with a clinical blend. Laboratory skills and practices (such as laboratory safety, aseptic technique, environmental growth conditions, microscopy, differential staining, media preparation and characteristics, classification of microorganisms, filtration and sterilization, operation and maintenance of basic laboratory equipment, sample collection and processing,

biochemical and morphological identification of microbes etc.) mastered in this elective when integrated with knowledge obtained through medical Microbiology and Immunology will significantly enhance the understanding of diagnosis, prevention and treatment of infectious diseases. Experience gained in this course will help immensely during subsequent years of the program (clerkship/hospital rotation) and during professional pharmacy practice.

*The pre-requisite of PH 132 is required.*

*Credits: 3*

*On Occasion*

#### **PH 272 Advanced Topics in Cardiovascular Pathophysiology**

The course provides students with the opportunity for in-depth study of cardiovascular disorders and their treatment. It focuses on the molecular mechanisms, symptoms, complications and consequences of hypertension, heart failure, ischemic heart disease, valve and congenital heart disorders, and arrhythmia. Students will have the opportunity to research and present information on a cardiovascular disease, and will utilize case studies and research articles to gain in-depth knowledge of the various cardiovascular disorders.

*The pre-requisites of PH 130 and 131 are required.*

*Credits: 3*

*On Occasion*

#### **PH 273 Advanced Molecular Immunology and Immunopathology**

This course is designed to provide a thorough understanding of the following: (1) humoral and cellular immune processes that guard against pathogens and other exogenous agents; (2) the molecular basis of the production of a repertoire of antibodies and T-cell receptors against all possible antigens by the B- and T-cells respectively by rearrangement of the respective genes; (3) hierarchy in the expression of the immunoglobulin genes, immunoglobulin isotype succession, membrane-bound and secretory antibodies; (4) major histocompatibility determinants etc.; (5) immune-mediated disorders including autoimmune disorders stemming from the four types of hyperimmune processes, transplantation immunology; (6) cancer of the immune system, acquired and inborn immunodeficiency disorders; (7) immunization strategies; (8) immunology-based approach to therapeutics; (9) immunotechniques used for clinical and diagnostic purposes; and (10) recent trends in the pharmacological application of genomics.

*The pre-requisites of PH 132 is required.*

*Credits: 3*

*On Occasion*

#### **PH 300 Visitation Introductory Pharmacy Practice Experience**

The student pharmacist will be expected to "visit" a variety of off-campus locations to observe the practice of pharmacy. More specifically, the student

will be assigned to spend one 4-hour afternoon period at each of the following locations: a community pharmacy, a hospital, a long-term care facility, and at a service learning exercise organized by a community pharmacist. Additional sites may be assigned as well. The student will also observe the manner in which complementary and alternative therapies are sold in locations without a pharmacist being available to assist patients. Following the site visits, each student will need to complete an assignment (which in many cases includes a reflective essay) and participate in a reflective session on campus with a facilitator.

Pass/Fail.

*Credits: 0.50*

*Every Fall*

### **PH 311 Institutional Introductory Pharmacy Practice Experience**

This IPPE will expose the students to the practice and the administrative/distributive aspects of providing direct patient care in a hospital/medical center. The student pharmacist will observe (to a small degree) and participate with pharmacists, pharmacy students, and other health care professionals/students in providing patient care. During the "acute care" portion of the experience, the student will develop rudimentary care plans, will participate in "rounds" with a medical team, and will interact with patients. During the "distributive/administrative" portion of the experience, the student pharmacist will gain competencies in various areas such as unit dose dispensing and the preparation of intravenous admixtures. The student will have ample opportunity to perform interventions that are meaningful and valuable to the health care team while becoming familiar with the role of the hospital pharmacist. Opportunity might exist for the student to participate in special projects.

*The pre-requisites of PH 100, 101, 102, 111, 121, 132 and 133 are required. The co-requisite or pre-requisite of PH 200 is required.*

*Credits: 2*

*Every Fall and Spring*

### **PH 312 Community Pharmacy Introductory Pharmacy Practice Experience**

This introductory experience course will expose the student to the patient care, administrative, distributive, and overall practice of a contemporary community pharmacy. The student pharmacist will observe and participate with pharmacists, perhaps other pharmacy students, and other health care professionals in providing direct patient care. The student will become familiar with key elements involved with dispensing prescriptions (such as interpreting a patient profile, taking an oral prescription, preparing a product label, and counseling a patient, in order to assist the pharmacist in dispensing prescriptions). The student pharmacist also will observe/participate in assisting patients to select nonprescription agents, monitoring devices, and durable medical

equipment. Finally, the student will gain experience in developing care plans for ambulatory patients.

Pass/Fail only.

*The pre-requisites of PH 100, 101, 111, 121, 132, 133, 210 and 232 are required.*

*Credits: 5*

*Every Summer*

### **PH 400 Practice Management/Pharmacoeconomics**

The course introduces students to a variety of management concepts and practices in order to prepare them for the practice of pharmacy. This course includes a survey of criteria that facilitate the effective management of community, institutional and managed-care pharmacy. Students will apply principles of accounting, advertising, human resources management, marketing, pharmacoeconomics, and quality assurance simultaneously to optimize patient care, professional esteem and profit. The course will be devoted to issues centered around the development of innovative practices across various settings. Issues include the use of software and automation technology, disease management, education/consultation, documentation, drug-utilization evaluation, decision analysis, and maintaining financial and patient health data.

*The pre-requisites of PH 100 and 201 are required.*

*Credits: 3*

*Every Fall*

### **PH 410 Pharmacotherapeutics IV**

(The third of four courses.) These four courses, the second, third, fourth and fifth courses in the pharmacotherapeutics series, stress the understanding of important disease states and rational therapeutics of these conditions. The disease states are presented with emphasis on developing critical thinking and problem-solving skills. After completing these courses, students will be able to utilize pathophysiologic, pharmacotherapeutic and pharmacoeconomic principles to formulate pharmaceutical care plans for patient management. Development of pharmaceutical care plans includes problem identification, data collection and evaluation, implementation of appropriate therapy, and monitoring patient outcomes. Case studies and problem-based learning will be incorporated throughout the courses. Four lecture hours and one recitation hour.

*The pre-requisites of PH 111, 210, 230 and 232 are required.*

*Credits: 4*

*Every Fall*

### **PH 412 Clinical Pharmacokinetics**

This course focuses on the utilization and application of pharmacokinetic principles in developing a pharmaceutical care plan for a given patient. After completing this course, students will be able to dose and monitor drug therapy for those particular drugs with narrow therapeutic indices

utilizing their knowledge regarding the influence of age, disease and drug interactions on drug disposition.

*The pre-requisites of PH 420 is required.*

*Credits: 3*

*Every Spring*

### **PH 413 Pharmacotherapeutics V**

(The fourth of four courses.) These four courses, the second, third, fourth and fifth courses in the pharmacotherapeutics series, stress the understanding of important disease states and rational therapeutics of these conditions. The disease states are presented with emphasis on developing critical thinking and problem-solving skills. After completing these courses, students will be able to utilize pathophysiologic, pharmacotherapeutic and pharmacoeconomic principles to formulate pharmaceutical care plans for patient management. Development of pharmaceutical care plans includes problem identification, data collection and evaluation, implementation of appropriate therapy, and monitoring patient outcomes. Case studies and problem-based learning will be incorporated throughout the courses. Four lecture hours and one recitation hour.

*The pre-requisites of PH 210, 212, 410 and 421 are required. The co-requisite of PH 413R is required.*

*Credits: 4*

*Every Spring*

### **PH 414 Drug Information and Literature Evaluation**

This course is designed to introduce the student to the concepts involved in responding to drug information requests including analysis of the question, the systematic search of the literature, and ways to formulate and communicate a response. In addition, the student will learn how to evaluate biomedical literature with respect to the trial design, methodology, implementation, statistical analysis of results, and justification for the conclusion. Students will learn to interpret conflicting or contradictory findings in the literature. Overall, the student will be able to judge the merit of a published trial and determine to what extent the results can be extrapolated to a typical clinical practice setting.

*The pre-requisite of PH 201 is required.*

*Credits: 4*

*Every Spring*

### **PH 420 Pharmaceutics V**

This course focuses on the study of factors that influence the in vivo disposition of drugs, e.g., absorption, distribution, metabolism and excretion. The application of the principles of biopharmaceutics and pharmacokinetics to dosing and bioavailability is discussed. Mathematical models are generated to distinguish between various methods of drug input and output. There is also a brief examination of the analytical methods used to measure drug concentrations in various

body fluids. Finally, the relationship between pharmacokinetics and pharmacodynamics is explored, using a number of drug examples. Three lecture hours.

*The pre-requisite of PH 221 is required.*

*Credits: 3*

*Every Fall*

#### **PH 421 Self Care**

This course is designed to introduce the student to commonly used non-prescription products, vitamins, health foods and other nutritional supplements, home diagnostic kits, alternative medicine options and prescription accessories. It emphasizes the need for pharmacists to be proactive and interactive with patients in recommending and in using nonprescription products and to ensure their correct and safe usage. After completing this course, students will be able to perform the following tasks: assist patients in selecting the appropriate dosage form for self care and advising patients on correct use of selected non-prescription drugs; counsel patients concerning self care; monitor patients for unwanted drug effects and possible drug interaction; monitor patients' progress with regard to therapeutic objectives to maximize compliance and improve outcomes of therapy; counsel patients regarding the use of home diagnostic devices, health foods and vitamins, contraception and family planning; advise patients on the appropriateness of alternative medicine, diets, food and exercise. Students will have the opportunity to develop critical thinking skills through evaluation of case studies. Three lecture hours.

*The pre-requisite of PH 212 is required.*

*Credits: 3*

*Every Fall*

#### **PH 430 Iatrogenic Diseases**

This course is designed to discuss unfavorable or deleterious effects of a therapeutic or diagnostic regimen. The main focus of the course is to discuss drug-induced adverse reactions and their mechanisms at biochemical, cellular and molecular levels on various systems and functions of the patients undergoing treatment. In addition, the course will include discussion of unwanted responses that follow multiple drug therapy (drug interactions), and diagnostic procedure and/or use of any diagnostic agent. After completing this course, the student will be able to utilize this knowledge in counseling patients about expected adverse effects of their medications and/or diagnostic regimen. The didactic material will be supplemented by case reports from the literature. The reading assignments will include, but not be limited to, researching of overdose treatment protocols and other iatrogenic scenarios from the medical literature. Three lecture hours.

*The pre-requisites of PH 133, 210, 212, 230, 232 and 410 are required.*

*Credits: 3*

*Every Spring*

#### **PH 440 Health Promotion: Planning and Evaluating Pharmaceutical Care Programs**

The development, implementation and evaluation of a successful pharmaceutical care program depend on the critical application of several educational and behavioral principles and theories. To properly assess the value of pharmaceutical care programs, pharmacists need to be aware of appropriate methodological designs for developing and evaluating their pharmaceutical care programs. Programs that are better designed can yield more meaningful data as to which pharmaceutical care programs will most likely have the greatest impact on patient care. This course will help pharmacy students understand the basic steps and principles necessary to design, implement and evaluate a pharmaceutical care program. The course will also prepare students in writing a brief project proposal, develop brief methods to assess selected outcomes of a program, develop promotional items to market a pharmaceutical care program, and prepare a presentation about a program they have developed. Three lecture hours.

*The pre-requisites of PH 102, 210, 212 are required.*

*Credits: 3*

*On Occasion*

#### **PH 450 Patient Education**

This course is designed to help pharmacists who are not skilled in patient education but need to know how to design, implement and evaluate planned programs of educational activities to help improve patients' health behaviors and/or health status. This is a course on behavior, not drug information. Three lecture hours.

*The pre-requisite of PH 102 is required.*

*Credits: 3*

*On Occasion*

#### **PH 451 Pharmaceuticals in Nature**

With the growing popularity of natural drugs, new challenges are facing pharmacists in providing pharmaceutical care. It is the responsibility of practicing pharmacists to have an understanding of all the pharmaceutically active products their patients are using. This course will combine didactic classroom study with weekly field trips to search for and identify pharmaceuticals in their indigenous environment. Scientific research with specific product information on thirty of the most popular clinically relevant herbal products (focusing on those found in the local environment) will be presented. The side effect profile for each herbal medicine will be clearly delineated and potential interactions and contraindications will be addressed. To enhance the formulation of pharmaceutical care plans for patient management these products will be critically compared to more conventional medications used for similar indications. Concepts in the arena of alternative medicine such as naturopathic medicine and homeopathy will be discussed. Field trips will

account for approximately one-half of the time allotment of this course. Proximate to the New York metropolitan area, Gateway National Recreation Area offers the perfect field laboratory to study naturally occurring useful plants indigenous to this vast complex natural resource. Factors responsible for the accelerating decline and depletion of these vital coastal areas will be considered. Recognizing the need for protection and conservation of this delicate ecosystem will lead to a discussion of political issues relative to this habitat at risk. In addition, a rudimentary understanding of the natural wildlife that impacts on the environment that sustains these natural products will lead to discussion of the shore birds that are a part of the delicate ecosystem that is under study.

*Credits: 3*

*On Occasion*

#### **PH 460 Drug Metabolism and Disposition**

This course will discuss and detail the major pathways that contribute to drug metabolism and disposition: biotransformation enzyme processes and membrane transport systems. The first part of the course will focus on the various enzyme systems that are responsible for biotransformation (e.g., cytochrome P-450 and glucuronyl transferase). Topics to be discussed include classification of these systems and their distribution in the body, phenotype/genotype issues, and clinical implications. The second part of the course will cover the numerous membrane transport systems that have been identified in four organ systems that are of primary importance for drug disposition and activity: gastrointestinal, hepatobiliary, renal, and central nervous systems. A focus of this material will be the strategies used to modulate these transport systems to improve bioavailability, distribution and, consequently, efficacy. Three lecture hours.

*The pre-requisites of PH 121, 131, 220 and 221 are required.*

*Credits: 3*

*On Occasion*

#### **PH 462 Applied Pharmacokinetics**

This course consists of lecture and computer classroom instruction. The course has a practical goal and students will work with data sets from recent literature to perform the required statistical and pharmacokinetic analysis. The course will provide students with hands-on practice with professional pharmacokinetic software packages. The course consists of an introductory overview of biostatistical topics such as elementary probability theory, hypothesis testing, analysis of variance, regression and correlation, and non-parametric methods. All these concepts will be explained with examples pertinent to pharmacokinetic analysis. Then the students will be exposed to the principles of clinical study design including bioavailability and bioequivalence studies according to FDA guidelines. Primary clinical literature will be

analyzed and used as a source of data for in-class analysis. The basic compartmental and non-compartmental pharmacokinetic models will be reviewed. The students will learn how to use nonlinear regression programs (winnonlin and/or ADAPT II) to perform nonlinear regression analysis on pharmacokinetic data. A detailed discussion of the computer output will permit the selection of the most appropriate model and parameters describing the data based on sound statistical principles.

*The pre-requisites of PH 121, 220 and 221 are required.*

*Credits: 3*

*On Occasion*

#### **PH 463 Sterile Products**

This course will explain in detail the various procedures necessary to prepare, dispense and label sterile products, to validate methods of sterilization and aseptic processes, and to assure the quality and control of environmental conditions for aseptic operations. Aseptic techniques, incompatibilities, finished product release testing, storage and expiration dating will also be presented. Students will gain practical experience in laboratories in compounding, dispensing, reading and interpreting prescriptions.

*The pre-requisite of PH 220 is required.*

*Credits: 3*

*On Occasion*

#### **PH 464 Prescription Accessories**

This course will discuss the importance of the prescription accessory department as a part of the ambulatory pharmacist's practice. Prescription accessories will be categorized with respect to the pharmacist's participation as a member of the healthcare team. Topics to be covered include: thermometers, home pregnancy tests, pregnancy preventatives, enemas, feminine syringes, pessaries, rectal and vaginal dilators, nasal aspirators, diabetic monitors and accessories, male impotency pumps, SIDS monitors, enuretic devices, vaporizers, humidifiers, nebulizers, atomizers, wound care, tissue trauma, bandages and surgical dressings, ostomy supplies and devices, durable medical equipment, and types of orthotics and fitting procedures for such accessories. Issues related to third party reimbursement policies for prescription accessories will also be discussed.

*The pre-requisites of PH 201 and 211 are required.*

*Credits: 3*

*On Occasion*

#### **PH 465 Contemporary Compounding**

This course is designed to educate pharmacy students in the compounding of extemporaneous dosage forms such as capsules, suppositories, suspensions, ophthalmic solutions, lip balms, ointments, etc. It also introduces the students to the concepts of home infusion therapy and gives them an opportunity to practice the preparation of total parenteral admixtures. The objective of the

course is to provide pharmacy students with a hands-on opportunity to practice their chosen profession. As compounding pharmacy continues to grow, it will provide more pharmacists with the opportunity to use their innovative skills to solve patient problems. In this course, students will be trained to assess and be aware of the requirements for and the uniqueness of formulating a specific drug product for a specific patient. This service constitutes an important component in providing pharmaceutical care. Reference materials used in this course will familiarize the student with the facilities, equipment and supplies necessary for extemporaneous compounding; records and record-keeping; stability of compounded products, pharmaceutical compounding calculations, quality control, etc. Laboratory hours will ensure that students properly interpret prescriptions, employ actives and excipients that are appropriate for any given dosage form. It will also make students cognizant of the quality of drugs, excipients, and other additives in terms of their stability, compatibility and, when necessary, sterility. Students will be exposed to compounding techniques commensurate with 21st century compounding.

*The pre-requisites of PH 220 and 221 are required.*

*Credits: 3*

*On Occasion*

#### **PH 466 Theory and Design of Controlled-Release Dosage Forms**

This course will cover the theoretical aspects of currently utilized dosage forms designed for controlling the release of drugs to the human body. A wide variety of drug delivery system designs will be analyzed in this course. Students taking this course will study the mechanisms and kinetics of drug release from these systems, structure and properties of fabrication materials, principles of molecular diffusion across polymer barriers and transport across biological interfaces.

*The pre-requisites of PH 121, 220 and 221 are required.*

*Credits: 3*

*On Occasion*

#### **PH 467 Industrial Pharmacy**

This course is designed to introduce the professional program pharmacy student to processes such as formulation, scale up, production, and stability-testing utilized in the manufacturing of pharmaceutical dosage forms. The methodologies and technologies used in these processes to produce various dosage forms such as tablets, ointments, creams, capsules, suspensions and sterile products will be presented. The different techniques used to formulate dosage forms possessing unique properties such as sustained or delayed release dosage forms will also be examined.

*The pre-requisites of PH 220 and 221 are required.*

*Credits: 3*

*On Occasion*

#### **PH 470 Biochemical Cofactors and Nutritional Supplements**

This course is designed to introduce students to the basic biochemistry of vitamins, cofactors, and other nutritional supplements. It is aimed at students who are interested in gaining an in-depth knowledge of these agents. Students will obtain expertise in the mechanism of action of all the major vitamins, the role of metals and other cofactors in augmenting the action of various enzymes, and their importance in key metabolic pathways. They will also explore the biochemical basis for the possible benefits of other nutritional supplements. Students will review current scientific data on nutritional supplements to assess the validity of anecdotal claims in the prevention or cure of diseases. After completing this course, students will be able to explain the mechanism of action of vitamins and nutritional supplements, assess the validity of claims by manufacturers and counsel patients and consumers on any special precautions and effective uses of these agents. The course will involve the use of problem-based learning, reviews of current scientific literature, and video presentations to reinforce key concepts and issues concerning the use of vitamins and other nutritional supplements.

*The pre-requisites of PH 131 and PH 232 are required.*

*Credits: 3*

*On Occasion*

#### **PH 471 Pharmacogenomics and Personalized Medicine**

This course will cover an introduction to the history of pharmacogenetics and pharmacogenomics, including a basic review of mechanisms of gene expression and gene regulation along with basic genetic concepts. Other topics that will be presented include genomic technologies including DNA sequencing, microarrays, and the quantitative polymerase chain reaction (QPCR). These technologies will be discussed in the specific context of drug discovery and development, and in human genotyping of genes involved in drug metabolism and transport. Students will be given the opportunity to review current case studies or examples of pharmacogenomics and drug responses.

*Credits: 3*

*On Occasion*

#### **PH 599 Special Projects**

This elective provides students with an opportunity to pursue their specific areas of interest in pharmacy, through working with one of the faculty members on a special project. As most of these independent studies and projects are research oriented, this course will provide students opportunities to develop critical thinking and problem-solving skills by doing one or more of the following: developing a study hypothesis, designing a study, researching a topic, collecting data, and analyzing as well as presenting the data. Through

working with faculty members in their area of interest, students also are able to explore in greater depth the knowledge base in that particular area of pharmacy. Students will choose to work with a faculty member in developing, implementing and completing a pharmacy project. The faculty member must be willing to mentor and work with the student to develop a project and guide him/her to completion. Once a student identifies a faculty member, the student will discuss and develop a hypothesis for a mutually agreed-upon project. A project proposal must be developed and signed off on by the faculty and the division director. The student must submit this signed-off proposal to the Assistant Dean for Academic and Student Affairs in order to be enrolled in the course.

*Credits: 3*

*On Occasion*

#### **PH 600 Community Pharmacy Advanced Pharmacy Practice Experience**

This experiential program will expose the student to the practice of pharmaceutical care in a community setting. Specifically, the student will develop a clear understanding of the role of the community practitioner and will understand the rationale for using prescription and nonprescription products. After completing this course the student will have the competencies to perform the functions of a registered pharmacist, such as dispensing a prescription, compounding an extemporaneous product, counseling patients appropriately, maintaining appropriate records, and advising physicians, dentists, nurses and other healthcare professionals about the use of prescription and nonprescription products. In addition, the student will be able to prepare and monitor healthcare plans for a variety of disease states such as asthma, diabetes mellitus, hypercholesterolemia and hypertension. The student's oral and written communication skills will be honed via interactions with other healthcare professionals.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*All Sessions*

#### **PH 602 Ambulatory Advanced Pharmacy Practice Experience**

This required advanced pharmacy practice experience (APPE) is designed to offer the student the opportunity to apply knowledge previously acquired from didactic courses in an ambulatory setting (usually, a hospital clinic). The student will sharpen his/her skills in verbal and written communication, patient data collection and evaluation, medication consultation, and medication therapy management. In this APPE the student will interact with health care providers in the out-patient setting to deliver patient centered care, provide drug information to patients and health care professionals, and participate in patient counseling sessions with an emphasis on adherence management. Participation in this APPE will afford

the student pharmacist an opportunity to be involved in the evaluation of educational material for ambulatory patients and the documentation of pharmaceutical interventions that benefit the patient.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*All Sessions*

#### **PH 603 Drug Information Advanced Pharmacy Practice Experience**

This advanced practice experience is designed to provide students with hands-on skills and expertise to retrieve drug information, evaluate the literature and communicate a drug-information response.

This clerkship is also designed to provide the student with more experience using computerized database retrieval systems. Students learn to apply a systematic approach to answering drug information requests. Students will be expected to use various types of reference sources, full-text databases, indexing/abstracting services, and Internet-based drug information to answer information requests.

In addition, students will evaluate literature, review monographs, write abstracts, write a drug monograph for formulary review, and/or write a column for publication.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 2.50*

*All Sessions*

#### **PH 604 Internal Medicine Advanced Pharmacy Practice Experience**

These experiences are designed to allow students the opportunity to develop skills based on the knowledge acquired in previous courses with an emphasis on formulating patient-specific pharmaceutical care plans. As an integral member of the healthcare team, the student will participate in medical rounds at a designated affiliate hospital/medical center. The student will, after completion of the clerkship, be able to demonstrate proficiency in critical thinking skills through the resolution of drug-related problems encountered during the rotations. The student shall be able to evaluate, criticize and modify patient-specific care plans, review and discuss treatment modalities, and provide monitoring parameters for therapeutic regimens and/or various disease states. Students will have ample opportunity to develop and demonstrate adequate communication skills and perform patient counseling.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*All Sessions*

#### **PH 606 Institutional Practice Advanced Pharmacy Practice Experience**

This advanced practice experience is designed to familiarize the student with various aspects of institutional pharmacy practice by rotating through

various areas within the pharmacy service of a hospital or medical center. Students will be exposed to various modern distributive systems, administrative functions, medication use evaluations, hospital committees, as well as the institution's policies and procedures. After completion of the clerkship, the student will have developed skills needed to make decisions involving the selection, storage and distribution of various pharmaceuticals, will be proficient in compounding, packaging and labeling practices of the institution, will be proficient in aseptic technique involving sterile products, will be able to decide which dosage forms and routes of administration are preferable for patient specific needs, and will gain valuable experience in counseling patients about their pharmacotherapy. Additionally, the student will have the opportunity to develop his/her sense of ethics and professionalism. Pass-Fail only.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*All Sessions*

#### **PH 607 Pharmacy Grand Rounds**

Monthly rounds are held in residence at LIU Pharmacy during the senior experiential phase of the professional program. Students are required to attend the rounds which will focus on new and recent developments in pharmacy and the provision of pharmaceutical care. Presentations and discussions may include issues of pharmacotherapeutics, pharmacoeconomics, pharmacy law, current professional concerns and initiatives, and innovative career pathways. Course may be repeated. Monthly rounds. Pass-Fail only.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 0*

*All Sessions*

#### **PH 608 Acute Care Advanced Pharmacy Practice Experience**

This required advanced pharmacy practice experience (APPE) provides an opportunity for the senior student to apply his or her knowledge in the patient care arena. In this APPE, the student pharmacist will be interacting with health care professionals and patients in one or more acute care settings. The student pharmacist will participate in medical rounds, develop treatment plans for patients, interview and counsel patients, perform interventions on a patient's behalf when needed, and, in general, gain exposure to one or more specialty areas in a hospital or medical center. By the completion of the APPE, the student pharmacist will have improved his or her critical thinking skills, taken responsibility for the provision of patient care, and developed important skills and abilities needed for life-long learning.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

## All Sessions

**PH 621 Drug Information in Health Care Publishing Advanced Pharmacy Practice Experience**

This advanced pharmacy practice experience (APPE) elective consists of five weeks at Physicians' Desk Reference (PDR), during which time the student will learn the manner in which drug information is compiled and disseminated to health care professionals and, perhaps, the general public. The student will have the opportunity to create concise drug information monographs and/or articles based on FDA-approved labeling and will participate in planning and creation of publications for the health care marketplace. Students will develop familiarity with creative aspects of drug information publication and further improve their medical/scientific writing and literature evaluation skills. Depending on the time of the year, students may get the opportunity to gain experience with one or more publications including the following: PDR main edition; PDR for Nonprescription Drugs, Dietary Supplements, and Herbs; PDR Nurse's Drug Handbook; Red Book; and PDR Monthly Prescribing Guide.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 622 University Hospital-Based Drug Information Advanced Pharmacy Practice Experience**

The University Hospital-Based Drug Information advanced pharmacy practice experience allows the student to develop a wide base of pharmacotherapeutic knowledge in all areas relating to pharmacy practice. The student will enhance his/her skills in drug information retrieval and evaluation of the material, as well as the source from which it came. These skills will be integrated into the students' overall experience through written and verbal communication with members of the healthcare community. Students will gain practical experience by responding to drug information inquiries from healthcare professionals, both through the drug information center and at multi-disciplinary meetings; preparing written documents to disseminate drug information; participating in pharmacy journal clubs; and becoming familiar with the administrative activities within a hospital-based Drug Information Center. Professional conduct with phone and written communication will be emphasized. This advanced drug information elective clerkship will provide the student not only with a reinforcement of skills learned in the drug information clerkship, but will expose the student to administrative activities of a drug information specialist in a university hospital. Career options as a drug information specialist will be thoroughly discussed.

*The pre-requisites of PH 300, 311, 312 and 413 are*

*required.*

*Credits: 5*

*On Occasion*

**PH 623 Advanced Drug Information University-Based Advanced Pharmacy Practice Experience**

Today's pharmacists participate in all aspects of patient care. Comprehensive delivery of pharmaceutical care requires that pharmacists effectively access, interpret, organize, and provide pertinent information. Pharmacists who provide such information readily to patients and members of the health care team will be recognized for this expertise. Requests for drug information are frequent and require rapid follow up. Referrals to drug information specialists may not be possible because of time constraints. Furthermore, many organizations do not have such specialists. Therefore, pharmacists directly responsible for patient care must be skilled in drug information retrieval and evaluation. This elective drug information advanced pharmacy practice experience (APPE) will help develop and improve the student's skills in providing drug information. The APPE consists of five weeks at the International Drug Information Center (IDIC). Advanced training will enhance the student's competency and expertise in retrieving and disseminating drug information to health care professionals. In addition, students will develop familiarity with various resource materials and further improve their scientific writing skills.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 624 Extended Internal Medicine Advanced Pharmacy Practice Experience**

The Extended Internal Medicine experience is designed to allow the student the opportunity to develop and use skills based on the knowledge acquired in previous courses with emphasis on formulating patient-specific care plans. The student must attain these skills to be prepared to practice pharmacy independently. As an integral member of the health care team, the student will participate in daily work and attending rounds in an in-patient setting. This will incorporate rounding on an internal medicine floor and, to some extent, perhaps in a pharmacy specialty area at a designated hospital or medical center. The student will be afforded the opportunity to develop critical thinking skills by collecting relevant data, evaluating the data, formulating a judgment from the information presented, formulating an opinion, and lastly making a decision. While making clinical decisions, this APPE will further develop the student's skills in critical thinking, problem solving, literature evaluation, and written and oral communication.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 625 IV Admixture/Home Infusion Advanced Pharmacy Practice Experience**

One of the fastest growing fields in pharmacy is that of home infusion preparations. Due to the high cost of hospitalization, more and more insurance companies and physicians are requiring patients to be treated at home, in nursing homes and in hospices whenever feasible. This very often requires the use of IV and TPN therapy to be administered by a nurse or qualified home attendant. A number of specialized pharmacies are now providing these preparations and the need for pharmacists particularly skilled in the preparation of the products is steadily growing. This elective advanced pharmacy practice experience focuses on this skill and allows the student to become totally proficient in all aspects of home infusion therapy. The student will become proficient in aseptic technique and compounding parenteral products. Students also learn proper procedures for safely preparing chemotherapeutic agents and will have the opportunity to reinforce their ability to perform pharmaceutical calculations. In some instances, the student may have input into the selection and proper dosage of medication. Finally, the student will have the opportunity to learn about the administrative aspects of this specialized area.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 626 Hospital Pharmacy Administration Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience (APPE) provides opportunities for the student to work with the director of pharmacy and other administrative personnel to develop skills necessary to manage the day-to-day activities involved with a department of pharmacy in a hospital. Students will learn the process involved in evaluating the appropriateness of drug therapy or effectiveness of drug delivery activities. They will also have the opportunity to work with other health-care disciplines to ensure the safe and effective use of medications and prevent/minimize drug-related problems. Examples of course activities include attending administrative meetings, developing drug utilization evaluation criteria, writing a drug monograph for presentation to the Pharmacy and Therapeutics Committee, and reporting adverse drug reactions.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 627 Treatment of Substance Abuse Advanced Pharmacy Practice Experience**

Patients who abuse controlled substances may now be followed and treated through a continuum of care that starts with detoxification, is followed by a

rehabilitation program, and continues with visits to outpatient facilities that support the patient's education and psycho-social needs. The pharmacist must be aware of the special problems related to the care of these patients, particularly in regard to their specific pharmacotherapeutic needs. This elective advanced pharmacy practice experience (APPE) provides the student with the opportunity to provide direct patient care for patients with issues related to the abuse of controlled substances. Upon the completion of this APPE, the students will be able to do the following: identify, evaluate, ameliorate, and recommend solutions to the drug related problems; monitor the outcomes of the patient's pharmacotherapy; evaluate the literature on substance-abuse treatment programs.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 628 Pharmacy Ambulatory Compounding Advanced Pharmacy Practice Experience**

A select number of pharmacists and pharmacies have specialized in compounding extemporaneous products. They have acquired the expertise, equipment and the ingredients necessary to prepare the oral and topical medication specific to the individual patient's requirements. There is a need for pharmacists to be able to perform compounding functions in a pharmacy also described as "secundum artum." This elective advanced pharmacy practice experience is designed to allow the student, who is interested in this limited but growing field of pharmacy, an opportunity to develop compounding skills as well as to allow the student to perfect his/her counseling and general prescription dispensing skills.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 629 Ambulatory Care Elective Advanced Pharmacy Practice Experience**

This is a 5-week elective APPE in community pharmacy. This experience will prepare students to practice patient-centered care in the community setting. Students will have the opportunity to develop and participate in various patient care activities such as disease state management, medication therapy management, and health screenings/wellness programs. Students will provide comprehensive patient counseling in a variety of areas including nonprescription, herbal, and prescription medications, and home health devices. Additionally, students will gain experience with MTM, and communicating recommendations to other health care providers including pharmacists, physicians, and nurses. The students will also participate in dispensing activities, specialty compounding, and other patient services for the advancement of patient care in the community pharmacy.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 630 Cardiovascular Pharmacotherapy Advanced Pharmacy Practice Experience**

The cardiovascular pharmacotherapy elective advanced pharmacy practice experience (APPE) provides opportunities for students to develop an in-depth understanding of the pathophysiology and pharmacotherapy of cardiovascular disease states, and most importantly, allows students to deliver pharmaceutical care to patients suffering from these diseases. After completing this APPE, the students will be able to do the following: identify, evaluate, resolve, and prevent drug-related problems; implement appropriate pharmacotherapy; monitor patient outcomes; critically evaluate literature dealing with cardiovascular disease.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 632 Critical Care Pharmacotherapy Advanced Pharmacy Practice Experience**

Through observation and practice, this elective advanced pharmacy practice experience allows the student to develop his/her role as the pharmacist on the ICU team. Expansion of the student's knowledge of pharmacotherapy in the critically ill patient, specifically, general medicine, neurologic, pulmonary, cardiovascular, peripheral vascular, and trauma surgery patients is expected. Emphasis will be placed on prospective drug therapy management that involves the monitoring of efficacy and toxicity of regimens related to areas such as sedation, pain management, infectious disease, cardiology, neurology, renal and hepatic disease, nutrition and preventative medicine (e.g., stress ulcer prophylaxis, deep vein thrombosis prophylaxis). While making clinical decisions, this elective will refine the student's skills in critical thinking, problem solving, literature evaluation, and written and oral communication.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 633 Emergency Medicine Pharmacotherapy Advanced Pharmacy Practice Experience**

The Emergency Medicine elective advanced pharmacy practice experience allows the student to develop a wide base of knowledge in the patient assessment and management of various undifferentiated conditions as they present to the Emergency Department. The student will learn the three dimensions of the emergency medicine model of practice, all of which are interrelated. For example the student will become familiar with the patient acuity (low level, emergent, and critical), tasks that must be completed by the healthcare

team, including pharmacotherapy and the vast number of conditions that may be observed. The student will have the opportunity to provide patient care to all locations of the ED, such as "fast track", resuscitation, observation unit, and pediatric emergency department with an emphasis on surveillance for drug related problems, assuring appropriate pharmacotherapeutic interventions, conformance with hospital formulary and medication guidelines, facilitating expedient medication procurement (supervised), monitoring to assure achievement of desired endpoints and discharge plans. An emphasis will be placed on patient counseling and communication with health care providers for the acute stabilization of patients and for transfer of the patient to other services within the hospital such as internal medicine, cardiology, and trauma service and those who may be released from the ED. Students will gain practical experience by participation in multidisciplinary activities that may include daily attending rounds, weekly grand rounds, pharmacy journal club, and pharmacotherapeutic care plan preparation for a variety of patients. Acute stabilization, identifying drug related-ED admissions, reporting of out-of-hospital adverse drug events, as well as in-hospital adverse drug events will be emphasized, and surveillance for patients at risk with medications administered to the patient while in the ED.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 634 Geriatric Advanced Pharmacy Practice Experience**

This geriatric elective advanced pharmacy practice experience provides opportunities for students to develop an in-depth understanding of the pathophysiology and pharmacotherapy of common disease states, as well as pertinent social and psychological issues involved in providing pharmaceutical care to geriatric patients. This APPE also allows students to deliver pharmaceutical care to patients/residents residing in nursing homes or similar environments. After completing this APPE, the student will be able to do the following: identify, evaluate, resolve, and prevent drug-related problems, implement appropriate pharmacotherapy, monitor patient outcomes, and critically evaluate literature in geriatric medicine.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 635 Nephrology Pharmacotherapy Advanced Pharmacy Practice Experience**

During this 5 week Advanced Pharmacy Practice Experience, students will be able to learn how to manage patients with various types of kidney problems and how to adjust patient's pharmacologic therapies to improve functioning

and prevent disease progression as well as recognize the potential nephrotoxicity of various therapeutic and diagnostic agents. Students will be part of a multidisciplinary team working with various health care professional to improve care of patients with renal disorders.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 636 Infectious Disease Pharmacotherapy Advanced Pharmacy Practice Experience**

Infectious diseases are major causes of human morbidity and mortality worldwide. This elective advanced pharmacy practice experience provides opportunities for students to develop a greater understanding of the pathophysiology and pharmacotherapy of infectious diseases. Experience will be gained in the collection, interpretation and application of patient specific data, which are used to assist with the design and implementation of therapeutic antimicrobial regimens. Further, this APPE is intended to provide the student with the opportunity to learn to ensure the safe, appropriate and economical use of antimicrobial agents in patients through the application of specialized skills, knowledge and functions.

*The pre-requisite of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 637 Pediatric Pharmacotherapeutics Advanced Pharmacy Practice Experience**

The pediatric pharmacotherapy elective advanced pharmacy practice experience provides opportunities for the student to develop an in-depth understanding of the pathophysiology and pharmacotherapy of commonly encountered pediatric disease states. The clerkship also allows the student to provide patient specific care to pediatric patients. A primary emphasis of this clerkship experience is to develop problem solving skills in pediatric pharmacotherapy. The student will gain practical clinical experience by actively participating in a variety of multidisciplinary activities including: daily service and attending rounds, pediatric grand rounds, pediatric chiefs rounds, and pediatric pharmacy journal club. The student will receive individualized attention by the preceptor on a daily basis. Daily pharmacotherapy rounds with the preceptor will emphasize the principles of patient specific care plan development for pediatric diseases.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 638 Psychiatric Pharmacotherapy Advanced Pharmacy Practice Experience**

In this elective advanced pharmacy practice experience students will round with the

multidisciplinary psychiatric team on a psychiatric closed unit and partake in activities with the other members of the team which ultimately result in improved patient outcomes. Disease state management from the student's standpoint includes educating patients, reviewing therapies, making recommendations, monitoring patient progress, and documenting services and outcomes.

Additionally, the student will apply critical thinking skills specific to the area of psychiatry, through the resolution of drug-related problems encountered during the rotation. After completing this clerkship, the student will be able to do the following relative to patients with psychiatric illnesses: identify, evaluate, resolve, and prevent drug-related problems; implement appropriate pharmacotherapy; monitor patient outcomes, and evaluate psychiatric literature.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 639 Neonatal Intensive Care Pharmacotherapy Advanced Pharmacy Practice Experience**

The neonatal intensive care pharmacotherapy elective advanced practice experience provides opportunities for students to develop an in-depth understanding of the pathophysiology and pharmacotherapy of various disease states, and allows students to deliver patient-specific care to patients suffering from these disorders. Through observation and practice, the student will develop his/her role as the pharmacotherapy expert on an interdisciplinary NICU team. With the multitude of pharmacotherapeutic interventions needed in these critically ill patients, students have a unique opportunity to recommend appropriate drug therapy and parenteral nutritional support. After completing this clerkship, the student will have an expanded expertise in the management of pre-term patients. Emphasis is placed on prospective pharmacotherapy and nutrition - including antibiotics, methylxanthines, surfactant, vaccines, total parenteral nutrition (TPN), and the rational selection of IV fluids.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 640 Long Term Care Advanced Pharmacy Practice Experience**

The long-term care APPE provides opportunities for students to develop an in-depth understanding of the pathophysiology and pharmacotherapy of common disease states as well as pertinent social and psychological issues involved in providing pharmaceutical care to long-term care patients. This APPE allows students to deliver patient care to long-term care residents. The students also will gain perspective into the unique administration aspects of managing pharmacy services in long-term care

facilities (e.g., external vendors, pharmacy consultants, modified unit dose distribution systems, and ward stock system). After completing this APPE, the students will be able to do the following: identify, evaluate, resolve, and prevent drug-related problems, implement appropriate pharmacotherapy, monitor patient outcomes, and critically evaluate literature in long-term care medicine.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 641 Managed Care Pharmacy/PBM Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience allows the student to develop skills and competencies that apply to the population and evidence-based pharmaceutical care. Students will receive an understanding and exposure to a managed care pharmacy practice setting, including plan design and benefit management "tools," and participate in a service that provides information to pharmacists and/or other health care professionals; and will participate in specific projects on contemporary pharmacy practice issues.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

#### **PH 642 Medication Policy Development Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience (APPE) provides opportunities for the student to work with other health-care disciplines to ensure the safe and effective use of medications and prevent/minimize drug-related problems. Medication management is often an important component in the treatment of many diseases and conditions. A well-planned and implemented medication management system supports patient safety and improves the quality of care. Unfortunately, adverse drug events and medication errors occur daily in all health care environments. Many patients are injured or die in hospitals each year as a result of adverse drug events, and medication errors are frequently implicated as causes for these events. A "medication error" results from an error in the process of prescribing, dispensing, and/or administering a medication. An "adverse drug reaction" is any response to a drug that is noxious and unintended, and which occurs at doses normally used in humans for prophylaxis, diagnosis or therapy of disease, or for the modification of physiological function. A safe medication management system addresses all steps of a medication use process, including selection and procurement, storage, ordering and transcribing, preparing and dispensing, administration and monitoring. In order to implement and sustain an effective system, pharmacists practicing in a health care setting must proactively identify safety risks at

each step of the medication use process and develop/implement policies to reduce/prevent adverse drug events. Examples of activities include participating in the development or modification of policies, conducting drug use evaluations, and tracking and trending adverse drug reaction and medication error data.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 643 Medical Communications in the Pharmaceutical Industry Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience consists of five weeks at a medical information department within a pharmaceutical company. This experience will enhance the student's communication, presentation, and writing skills and enhance the student's competency in retrieving and disseminating medical information to consumers and health care professionals while helping the department meet company goals and objectives. The student will gain experience responding to specific medical information requests and will participate in departmental projects related to the provision of medical information.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 644 Medical Writing for a Pharmacy Periodical Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience (APPE) consists of five weeks at Drug Topics News Magazine, during which time the student will learn the manner in which drug information and other relevant pharmacy practice information is compiled and disseminated to pharmacists. The student will have the opportunity to create articles on new drugs, guidelines, and other newsworthy topics based on FDA-approved labeling, news releases, and interviews with key opinion leaders and will participate in the planning and creation of the biweekly publication, Drug Topics. Students will develop familiarity with creative aspects of magazine publication procedures and further improve their medical/scientific writing and literature evaluation skills.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 645 Medical Education/Communication Advanced Pharmacy Practice Experience**

Students in this elective advanced pharmacy practice experience will be assigned to a medical education company for a 5-week period. The goal of this experience is to enhance the student's knowledge, skills, and experiences in medical

education/communications by immersing him/her in the development and delivery of educational programming and innovative means of providing healthcare information. The APPE helps students gain practical experience in educational program development, needs assessment research, educational outcomes evaluation, educational content development and validation, and CME activity planning and development. All students receive training on the CME industry, which includes ACCME and other association guidelines. *The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 646 Medical Communications and Marketing Advanced Pharmacy Practice Experience**

This advanced pharmacy practice experience helps students gain practical experience in the communication and marketing sectors of the healthcare industry. The students will be involved in developing marketing strategies and program solutions. This experience will provide them with an opportunity to participate in the creation of communication and/or marketing projects directed to healthcare professionals and/or patients. This 5-week experience will afford the student a glimpse into this alternative career pathway and expose and enhance the student's knowledge, skills, and experiences in medical communications and marketing through hands-on participation in development-to-delivery of agency projects.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 650 Corporate Management Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience will serve to expose a pharmacy student to alternative career opportunities, provide insight into business decision making process, and define the skill sets necessary for management positions. Students are provided hands on training in the areas of human resources, store operations, loss prevention, field operations and management, regulatory affairs, and professional and college relations.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 651 Health Outcomes Research Advanced Pharmacy Practice Experience**

With the rapid changes in the health-care environment, the roles of pharmacists have also become more diversified. Health outcomes research and software development is one such role. Pharmacists possess knowledge in pharmacotherapy, pharmacoeconomics, patient outcomes, and disease-state management that allow

us to be valuable consultants to pharmaceutical companies, other health-care industry companies, and patients. This elective advanced pharmacy practice experience (APPE) will serve to expose pharmacy students to this stimulating alternative career opportunity. The student will be introduced to the operations of a Health Outcomes Research and Software Development Firm. The student will learn and actively participate in business activities by acquiring skills in writing business proposals, performing market research, and attending new business presentations. A short-term written project, with presentation to staff and/or client, will be assigned to the student to evaluate his/her ability to perform literature searches, and exhibit his/her writing skills and oral presentation ability.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 652 Information Technology in Healthcare Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience (APPE) will expose the student to the complex world of pharmacy informatics allowing him/her to learn the various development and implementation techniques used by information technology pharmacists to benefit healthcare provided in the facility. In addition, the student will learn how to evaluate the strengths and limitations of the current systems and develop methods to improve them.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 654 Clinical Education Consultant - Field Based Industry Advanced Pharmacy Practice Experience**

In order to provide direct patient care, pharmacists need to develop critical thinking and communication skills so as to apply their extensive pharmaceutical and therapeutic knowledge effectively in a health care environment. This elective advanced pharmacy practice experience (APPE) will provide an opportunity for students to explore diverse roles and challenges faced by pharmacists in the changing face of the health care system within the United States. This APPE offers an opportunity to provide pharmacy consultative services to various health care "customers" including hospitals, long-term and skilled care providers, and managed care organizations. By spending five weeks in the field with the Pfizer Medical Outcomes Specialist, the student will gain a better understanding of this career opportunity.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 655 Medication Safety Advanced Pharmacy Practice Experience**

This selective advanced practice experience provides opportunities for the student to learn and participate alongside various persons responsible for improving medication safety in the hospital/medical center. These persons may include the director of medication safety, the director of pharmacy, and other administrative and clinical personnel. Students will have an opportunity to learn about different types of medication errors, factors that contribute to those errors, the severity of the errors, and the steps that go into their prevention. Students also will gain experience in collecting data on medication errors, analyzing the findings, communication with other health care professionals and administrators through a reporting mechanism, and tracking and trending an area of failure and success. Students will share the information obtained through various means such as a hospital-wide performance improvement initiative. Students may also have the opportunity to attend pharmacy and therapeutics committee meetings, interdepartmental performance improvement meetings, and monthly hospital-wide medication error rate reporting discussions.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 656 Pharmacovigilance Advanced Pharmacy Practice Experience**

This advanced pharmacy practice experience (APPE) consists of five weeks in a pharmacovigilance department within a pharmaceutical company. This experience will enhance the student's communication, presentation, and competency in screening for trends that can affect the safety and efficacy of a product. The student will be assigned to a specific therapeutic area and will work with the assigned therapeutic team. The student will be assigned a formal project to complete during the five-week period. The projects will involve researching special interest topics, conducting drug/disease therapy evaluations (DTE), and providing formal and informal presentations. The students will also participate in daily triage activity. Skills that will be developed throughout this APPE (depending on the specific projects that come along) may include technical proficiency with Microsoft PowerPoint, Microsoft Excel, Clintrace (safety database), presentation abilities, data analysis, drug information source retrieval, technical writing, communication skills and general problem solving/critical thinking. Students will be able to meet and attend department meetings and become familiar with other departments within the company.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 657 Medication Therapy Management Advanced Pharmacy Practice Experience**

The Medication Therapy Management Advanced Pharmacy Practice Experience is designed to provide the student pharmacist with the opportunity to develop and use skills based on the knowledge acquired in previous courses, with an emphasis on identifying and resolving medication-related problems. Following the MTM service model, the student will learn safe and effective medication use and the patient-centered process of assessing and evaluating a medication regimen, while collaborating with physicians and other healthcare professionals.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 680 Traumatic Brain Injury Rehabilitative Advanced Pharmacy Practice Experience**

The rehabilitative process in patients who are traumatic brain injured (TBI) is complicated and requires a dedicated interdisciplinary staff to achieve success. Medications as well as non-pharmacological therapies are a significant part of this process. The need for frequent medication changes and dosage adjustments make this an ideal setting for a pharmacist, and thus offers a unique experience for pharmacy students. This elective advanced pharmacy practice experience will prepare the student for an entry-level position helping to treat patients with traumatic brain injuries.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 681 Oncology Pharmacotherapy Advanced Pharmacy Practice Experience**

This elective advanced pharmacy practice experience (APPE) provides opportunities for students to develop an understanding of the pathophysiology and pharmacotherapy of oncological diseases with an emphasis on commonly occurring tumors such as breast, lung, colon, and lymphomas and leukemias, in an inpatient and/or outpatient setting. Experience will be gained in the collection, interpretation and application of patient specific data as well as data from the published literature, which are used to assist with the design and implementation of therapeutic chemotherapeutic regimens as well as supportive care treatment approaches. This APPE will prepare the student for an entry-level position helping to treat patients with various forms of cancer.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 683 Nuclear Pharmacy Elective Advanced Pharmacy Practice Experience**

The nuclear pharmacy elective advanced pharmacy practice experience (APPE) provides opportunities for students to develop an in-depth understanding of nuclear pharmacy as a specialty and practice same under the tutelage of a practicing nuclear pharmacist. The student also will gain a perspective into the unique regulatory aspects of radiation safety in nuclear pharmacy and external customers. After completing this experience, the student will be able to do the following: identify, evaluate, resolve, and provide clinical support to external customers in relation to patient care.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 688 Literature Evaluation in Peer Reviewed Medical Publishing Advanced Pharmacy Practice Experience**

This advanced practice experience consists of five weeks at Excerpta Medica, during which time the student will learn the peer review process for the journals Clinical Therapeutics and Current Therapeutic Research, and will have an opportunity to practice these learned skills. The student will review critiques prepared by outside reviewers, will perform critical evaluations of manuscripts submitted for publication, and will provide constructive criticism to the original authors. The student will communicate to the authors all the recommended changes in a professional, respectful but direct and clear manner. The student will review revised manuscripts to determine if the authors have responded appropriately to the reviewer's recommendations for changes to the manuscript and will then make a recommendation to publish or reject the revised manuscript. Students will develop familiarity with management and editorial aspects of the journals.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 696 International Pharmacy Practice and Public Health Advanced Pharmacy Practice Experience**

Students in the APPE will be provided with an opportunity to learn and experience first-hand public health, health policy, health system, healthcare delivery and health programs in various international locales by interacting with healthworkers, students and faculty. The goal of this APPE is to enhance the student's knowledge, skills, and experiences of delivering pharmaceutical care in challenging and traditionally underserved environments and to develop an appreciation of the workings of national-international partnerships in addressing specific health problems such as malaria and maternal/child health in developing countries.

Permission of Instructor required.

*Credits: 2.50*

*On Occasion*

**PH 697 Pharmaceutical Drug Analysis and Research Advanced Pharmacy Practice Experience**

This APPE will provide an opportunity for the student to participate in several aspects of the daily activities of a research pharmacy. Through interaction with research pharmacists and other professionals, the student will gain an initial exposure to the drug preparation process and/or pharmaceutical assessment research in general. The student will learn various experimental techniques commonly employed in his/her assigned research area. Working under the direction of research pharmacist, the student will be introduced to various research issues such as Current Good Manufacturing Practice (CGMP) guidelines, maintaining a laboratory book and data analysis techniques. Pass/Fail.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

**PH 698 Advanced Pharmacy Practice Experience - Research**

Throughout this five week elective APPE the pharmacy student will be taking an active role in ongoing research as directed by a faculty member or non-faculty member preceptor. The specific area of research may or may not be a traditional career path in pharmacy. Students will learn what is involved in the research process including the proper methods or technique required to conduct research. This APPE provides a unique opportunity for students to learn about the research process while being able to explore in greater depth a particular area of interest. Pass/Fail.

*The pre-requisites of PH 300, 311, 312 and 413 are required.*

*Credits: 5*

*On Occasion*

## ADMISSION

Admission to the LIU Pharmacy program is offered to men and women of scientific aptitude whose prior academic performance indicates that they are capable of successfully completing a challenging profession-oriented curriculum.

Admission to the pre-professional program (P-1, P-2) does not constitute acceptance to the professional program (P-3) Acceptance to the professional phase of the program is competitive Qualified candidates from the pre-professional phase who start as freshmen, who have a minimum cumulative 3.000 G.P.A. overall and in the required math and science courses, and who complete all preprofessional courses no later than the end of the Spring semester for the next Fall semester professional class will receive a preference for consideration of admission into the professional program. The preference is expressed as a weighting factor that is part of the analysis done of the other components of the admission selection process. Detailed guidelines for students seeking admission to the pre-professional phase are available later in this bulletin as well as in "Admissions" section of the LIU Brooklyn Bulletin.

Admission into the professional phase of the program is highly competitive. While objective measures of academic achievement and potential such as grade-point average (G.P.A.), score on Pharmacy College Admissions Test (PCAT), course load, selection and successful completion rate are factors heavily considered for admission, they are not the sole criteria. In addition to academic competence other factors such as written and verbal communication skills, community service, extracurricular activities, demonstration of leadership, understanding of the profession of pharmacy and motivation for entering the profession, work experience, letters of recommendation particularly those from alumni of the College and other individuals known to the College, and factors of diversity including, but not limited to, academic and professional background, geography, educational or economical disadvantage, culture and multilingual ability are among the selection criteria that may be considered by the College. In person admission interviews are also required.

### Application Pre-Professional Phase (P-1 and P-2) of the Programs

Applicants for P-1 or P-2 should refer to the LIU Brooklyn Undergraduate Bulletin (<http://www.liu.edu/Brooklyn/Academics/Bulletins>) and/or the Office of Admissions ([www.liu.edu/brooklyn/admissions](http://www.liu.edu/brooklyn/admissions)) for complete details regarding admission to the University; guidelines for completing and submitting an

application as well as supporting credentials; notification of admission decision; new student enrollment; and policies related to enrollment and admission procedures.

### Application Process and Deadlines for the Professional Phase (P-3) of the Program

Admission into the professional phase of the program is highly competitive. While objective measures of academic achievement and potential—grade-point average (G.P.A.); score on Pharmacy College Admissions Test (PCAT); course load, selection and successful completion rate are heavily considered factors for , they are not the sole criteria. In addition to academic competence other factors such as written and oral communication skills; community service, extracurricular activities, and demonstration of leadership; understanding of the profession of pharmacy and motivation for entering the profession; work experience; letters of recommendation particularly those from alumni of the college and other individuals known to the college; and factors of diversity including, but not limited to, academic and professional background, geography, educationally or economically disadvantaged, culture and multilingual ability are among the selection criteria for admission that may be considered by the College. Impressions formed and information gathered during the required personal interview and writing assignment are weighed in evaluating factors beyond academic competence.

To receive first consideration applicants must be currently enrolled in the pre-professional phase of the Doctor of Pharmacy program, must have achieved a minimum G.P.A. of 3.00 in all attempted college work; a minimum G.P.A. of 3.000 in all attempted and required science courses (specifically Biology 3, 4 and 131, Physics 27, Chemistry 3, 4, 121 and 122) and a minimum G.P.A. of 3.000 in all attempted and required math courses (specifically Mathematics 30 and 40). Preference is also given to those applicants who satisfactorily complete all P-1 and P-2 course requirements by the end of the Spring semester for the following Fall. An application for admission into the professional phase of the program must be submitted to the College through PharmCAS by the specified deadline date. Students should consult the PharmCAS website to determine the appropriate deadline date. The Pharmacy College Admissions Test (PCAT) is required for admission. An official PCAT score report should be submitted to PharmCAS. A personal interview is required. Not all applicants will be afforded the opportunity for a personal interview. Applicants selected for an interview will be from among those in the application pool demonstrating the highest academic achievement and potential.

Students who are accepted and enroll as

freshmen pharmacy majors in the pre-professional phase of the program receive a preference for consideration of admission into the professional phase of the program provided they complete the prescribed pre-professional program by the conclusion of the spring semester of their second year of study. A varying percentage of available seats in each professional class are set aside for such students depending upon the overall number and overall level of demonstrated academic performance of eligible students with institutional preference in any given year. The remaining number of seats are open to all applicants for the professional phase Acceptance into the professional phase of the program is not guaranteed for students receiving institutional preference since the ultimate selection is determined through the application of the criteria discussed in the preceding paragraphs. Due to the highly competitive nature of the program not all students meeting the basic academic requirements of the program will be selected for acceptance into the professional phase.

Students for the professional phase of the program (P-3) may enter only in the Fall semester. Application to the professional phase for external transfer as well as current LIU students is done through the Pharmacy College Admission Service (PharmCAS). The deadline for application to the program is also posted on the College's School Page on the PharmCAS website: ([www.pharmacas.org](http://www.pharmacas.org)).

Pharmacy (year 3) PharmCAS deadline:  
**December 3, 2013**

*Note: Deadline dates are subject to change based on administrative calendar changes. Please consult the admissions website at: [www.brooklyn.liu.edu/admissions](http://www.brooklyn.liu.edu/admissions) for more information related to the term of intended application.*

### Transfer from Other Colleges of Pharmacy

Students seeking transfer from colleges of pharmacy accredited by the Accreditation Council for Pharmacy Education (ACPE) must provide, in addition to official transcripts of all academic work, a statement of their reasons for seeking transfer and a letter of evaluation from the dean of their present college of pharmacy.

### Visiting Students

The College accepts visiting students who wish to audit or enroll for credit in pharmacy courses on a non-matriculated basis, depending on space availability. Such applicants must submit a Visiting Student Application (available from the Office of Admissions) indicating the specific courses for which they wish to enroll. Applicants

who have completed all stated prerequisites will be allowed to enroll, with the approval of the course instructor(s).

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## Students Presenting Foreign Credentials

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International applicants must submit all academic credentials, including a record of secondary school grades for the final three years, and results of any examination rendering a student eligible for university matriculation in his or her own country. Students are expected to have demonstrated adequate preparation in mathematics and English. All documents submitted must be translated into English and notarized.

All applicants are required to present their results on the Scholastic Aptitude Test (SAT). The Test of English as a Foreign Language (TOEFL) is required of all students for whom English is not the native language.

International students seeking transfer credit for course work completed at a non-U.S. college or university must present official transcripts from each institution attended and an official syllabus (written in or translated into English) showing duration and content of each course for which transfer credit is sought.

Health insurance coverage is compulsory for all international students including their dependents. Information pertaining to the health insurance coverage may be obtained from the Office of International Students, which assists students on campus.

Students holding F-1 (student) visas are required by law to be fully matriculated and be registered for at least 12 credit hours per semester.

Proficiency in the English language is required, and a student who needs additional study in English may be required to take English courses for international students at LIU.

Applications from international students must be accompanied by a nonrefundable \$40.00 application fee and received no later than May 1 for the Fall semester and November 1 for the Spring semester. When credentials are complete and found to be satisfactory, the applicant will be required to submit a \$500 deposit and a certified statement of financial support. The deposit will be applied to tuition and is not refundable should the student decide not to attend the University. An I-20AB or IAP-66 form will be issued upon receipt of the deposit and statement of financial support. Students should not make plans to come to the United States until they have received the immigration form.

Students should be aware of the high cost of living in New York City and the tuition rates and come prepared to finance their education. A limited number of scholarships are available to students on non-immigrant visas and are awarded primarily to students who have been in attendance at least one year.

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## Veterans

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The rules for admission and advanced credit for veterans under Federal and State laws are the same as those for other students.

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## ACADEMIC AND ADMINISTRATIVE REGULATIONS

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### Academic Responsibility

Candidates for a professional degree from LIU Pharmacy are expected to know the graduation requirements set forth in this publication. It is the responsibility of the student to know and comply with the academic requirements and regulations of the College as well as those of LIU.

All students must seek the counsel of an academic adviser. Students must also meet basic standards of performance established for each class with respect to attendance, promptness in completing assignments, correct English usage, accuracy in calculations, neatness and general quality of workmanship. Fulfillment of these fundamental responsibilities must be recognized by the student as an essential prerequisite to achieving satisfactory academic standing and to being recommended by the faculty for a degree.

### Attendance

Successful work in LIU Pharmacy is dependent upon regular class attendance. All students are expected to attend classes and to participate in classroom activities. Faculty have the right to weigh attendance and class participation in determining grades. Consequently, excessive absences may impact negatively on the evaluation of a student's performance.

Pre-professional pharmacy students should consult the LIU Brooklyn Undergraduate Bulletin regarding attendance requirements.

For students enrolled in years P-3, P-4, P-5 and P-6, faculty will inform students at the beginning of each semester of policies governing attendance as written in the course outline or syllabus distributed to the students.

Attendance is required of all students in years P-3, P-4, P-5 and P-6 in recitations, laboratories and in Introductory and Advanced Pharmacy Practice Experiences. Students in the experiential programs may be permitted to leave the sites from time to time when returning to the College for special events, upon the approval of the preceptors.

### Tardiness

Students are expected to be present from the beginning of classes and laboratories until the instructor dismisses them. Students are expected to comply with the hours set by preceptors for experiential courses. If students arrive late, they may be denied admission or marked absent. Habitual tardiness and/or failure to attend hours set by preceptors for experiential courses may impact negatively on the evaluation of a student's performance. Additionally, disciplinary action may

be undertaken for students with habitual inattentiveness to punctuality and attendance.

### Full-Time Students

A full-time student is one who is carrying 12 or more credit hours in each semester. Sixth-year students registered for six or more credits in the summer are considered full-time for the summer session.

### Change of Address or Telephone Number

All professional students must report changes of address or telephone number to the LIU Brooklyn Office of the Registrar and to the LIU Pharmacy Office of Student and Professional Affairs.

### Cancellation of Courses

LIU Pharmacy reserves the right to cancel undersubscribed courses. When it does so, there is no program change fee.

### Summer Session(s)

A maximum of eight credit hours of coursework is allowed during any one summer session except for the sixth-year student's advanced practice experiences or by special permission from the Assistant Dean for Academic and Student Affairs.

### Auditing of Courses

Auditing of courses (without credit) is allowed only with the permission of the Assistant Dean for Academic and Student Affairs. The audit fee is set at one-half the regular tuition fee, plus the full application fee for new students. On behalf of special programs of instruction, the Assistant Dean for Academic and Student Affairs may authorize exceptions to the rules for auditing.

### Minors and Double Majors

In addition to having the professional program in pharmacy as a student's major students may wish to have a minor. A minor may consist of at least 12 credits in courses numbered over 100 in a department or discipline other than LIU Pharmacy. A student must have permission of the Assistant Dean for Academic and Student Affairs to complete a minor. Once a student successfully completes 12 or more credits in courses numbered over 100 for a minor, the Assistant Dean for Academic and Student Affairs will notify the Registrar to enter the minor on the student's transcript. Due to the course requirement of the Doctor of Pharmacy program plan, in the vast majority of cases electing to pursue a minor will

necessitate additional credits for the completion of the degree.

Students pursuing the Doctor of Pharmacy program are not permitted to pursue a double major.

### Electives

Generally, students are expected to enroll in elective offerings of Doctor of Pharmacy program of LIU Pharmacy to fulfill the elective requirements for the degree. On occasion, students may be granted permission to take graduate course offerings of LIU Pharmacy and/or course offerings from other colleges and schools of LIU Brooklyn. Students wishing to receive credit for the fulfillment of professional elective requirements for courses outside of those offered as professional electives must seek permission from the Assistant Dean of Academic and Professional Affairs in advance of enrolling in such courses. Students are expected to present written statements indicating their reasoning for enrollment in electives other than those offered through the Doctor of Pharmacy degree program.

### Policy for Taking Courses at Another Institution

All courses for the professional phase of the Doctor of Pharmacy program (years 3-6) must be taken in residence at LIU Pharmacy. Pre-professional matriculated students at LIU Brooklyn may only take courses at another institution as a visiting student under the following conditions:

1. Students must file an "Application to Take Courses at Another Institution" with their respective Dean's office. Students must provide evidence of course equivalency to the corresponding LIU Brooklyn course. Note: Permission must be granted by the Dean, not the student's academic adviser.
2. The other institution must be a four-year accredited institution (two-year community colleges are unacceptable).
3. Students may not take a course at another institution within the New York City metropolitan area (within a 50-mile radius of LIU Brooklyn) if the course is being offered at LIU Brooklyn.
4. If a course required for graduation is not being offered at LIU Brooklyn in a given semester, or the student lives outside the New York City metropolitan area, then permission can be considered.
5. Students must be in good academic standing; students on academic probation cannot be granted permission to attend other institutions.
6. The visiting student authorization becomes automatically invalid if, by the conclusion of the term during which it is granted, the student is placed on academic probation.

7. Only letter grades of C or above are acceptable for transfer credit. Grades of D or P are not transferable. Grades earned at another institution are not used in the computation of either the student's major or cumulative average, they do not remove F grades earned at LIU Brooklyn, nor do they count toward fulfillment of residence requirements or the requirements for graduation with honors.
8. Visiting student authorizations are granted for a maximum of 9 credits.

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## Dean's List

The Dean's List for each semester of each class year consists of those matriculated students who are registered in that class year, have completed at least 12 credits during that semester, received a passing grade in every subject for that semester and achieved a grade-point average of 3.500 or more for that semester. Students who earn a C-, D, F, W, WF, UW, U, INC, or ABS in any semester, even though the symbols are subsequently changed to grades, may not be placed on the Dean's List for that semester. A student who receives an NGR (no official grade receive) in any semester will not be placed on the Dean's list until the NGR is replaced with a grade, excluding those listed above, that otherwise qualifies the student for the Dean's List.

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## Examinations

### Absence from Tests and Examinations

If a student is absent from any test or examination, including a final examination, the instructor may afford or deny him or her an opportunity to make up the work that was missed. In such cases, the instructor is the sole judge of the validity of the student's excuse.

### Absence from a Final Examination

Any student who for any reason is absent from a final examination and who wishes to take a deferred final examination is required to apply, in writing, within five days to the Assistant Dean for Academic and Student Affairs to ask for permission to take a deferred final examination, giving the reason for the absence from the examination. The student also may need permission from the course instructor, as noted in individual syllabi.

If the absence was caused by sickness or injury, the letter must be accompanied by a medical certificate stating when the illness began or the injury was sustained, and the number of days of confinement recommended by the physician. If the absence was caused by death in the immediate family, the student must indicate the date of death and the relationship to the deceased.

If the absence is justifiable, permission will be granted to take a make-up examination for which a specific fee is charged for each exam up to three exams. An admission card or other suitable evidence of payment must be granted to the instructor before such examinations are given.

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## Grades and Symbols

The following grades are used: A, A-, B+, B, B-, C+, C, C-, D, F, P.

The following symbols are used:

**U:** The symbol U is assigned in certain proficiency courses when a student has completed all work in a fashion unacceptable to warrant a passing grade. The student must repeat the course in the semester immediately following. The symbol U is not computed in the student's average. A student may receive only one U symbol in any course. On the second enrollment, the student must either satisfactorily complete the course or receive an F.

**ABS:** The symbol ABS (Absence from Final Examination) is assigned when a student has failed to take the final examination in a course in which he or she was doing satisfactory work. If a student fails to take a deferred final examination, the ABS is changed to F at the end of the next semester. If the ABS is made up, the final grade will appear on the student's permanent record as I followed by the grade assigned. A grade of F is assigned when a student misses the final examination in a course in which the student was doing unsatisfactory work.

**INC:** The symbol INC (Incomplete) may be assigned if, for reasons acceptable to the instructor, a student has failed to complete a part of the required course work. An INC is given only at the discretion of the faculty member. It is the student's responsibility to make specific arrangements with the instructor to complete the coursework and to have the grade submitted to the Office of the Registrar before the end of the next semester. If the course is completed within the next semester, both the INC and the final grade will appear on the student's permanent record. Satisfactory completion of the course does not eliminate the original "Incomplete" designation.

An INC grade which is not made up during the next semester becomes an F.

**W:** The symbol W (Withdrawn) is assigned when a student officially withdraws from a course in which the student was doing satisfactory work. Students must obtain a Withdrawal Form from the Office of the Registrar and have this form signed by the instructor of the course(s) concerned. (See also under WITHDRAWAL.)

**WF (Withdrawn, failed):** The symbol WF is assigned when a student withdraws and is doing unsatisfactory work. The WF is not computed in the cumulative average.

**UW (Unauthorized Withdrawal):** The symbol UW is assigned when a student unofficially withdraws from a course. The UW is not computed in the student's average.

**PASS-FAIL OPTION:** In elective courses, the student has the option of choosing his or her course grade on a P-F basis or on the regular letter-grade basis. This choice must be made and indicated to the instructor no later than the official withdrawal date for the course. Certain required courses must be taken on a Pass-Fail basis. Grades in Special Projects courses and certain experiential courses are P and F.

**NGR:** A temporary symbol of NGR (No Grade) has been adopted for instances when no grade has been submitted at the time grades are recorded. NGR will automatically be noted by the academic management system when the instructor has not yet submitted the course grades, or leaves one grade blank.

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## Changes on Academic Records

Students have until the time of their graduation to have changes made on their academic records. Once a student has graduated, the academic record is frozen and cannot be changed retroactively.

### Failure to Fulfill Nonacademic Requirements

Students failing to fulfill all nonacademic requirements (tuition, fees, library obligations, etc.) will be denied subsequent services, including, but not limited to, withholding of diplomas, transcripts, letters of recommendation, or licensure eligibility until those requirements are met.

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## Repeating Courses

Students may repeat any course to improve the grade, no matter what the previous grade was. To repeat a course more than once, they must have permission of the Assistant Dean for Academic and Student Affairs.

All "F"-graded professional course work must be successfully repeated as soon as the course is offered again (exclusive of summer sessions).

A course in which a student received a grade of "C" may be repeated only if all courses in which an "F", "D", or "C-" grade previously earned have been successfully repeated with a "C" or better.

A required course in the professional curriculum may not be repeated more than twice. Failing a required professional course three times is cause for dismissal. Credit will be earned only once, and the second grade, whether higher or lower, will be computed in the student's G.P.A. After the second time a student takes a course, all grades except the first will be computed in the student's G.P.A.

The College is not obligated to offer courses that the student has failed in the academic term immediately following the failure.

## Quality Points

The quality point value 4.000 has been assigned to the grade of A, 3.667 to the grade of A-, 3.333 to B+, 3.000 to B, 2.667 to B-, 2.333 to C+, 2.000 to C, 1.667 to C-, 1.000 to D, and 0.000 to F. The quality points to which a student is entitled are computed by the formula  $X = N \times Y$ , where X is the number of quality points, N the quality point value assigned to the grade, and Y the number of credits.

The grade-point average is obtained by dividing the sum of the quality points received in all courses by the total number of credits, including unrepeatable F's. A credit is equivalent to 1 lecture or recitation hour and/or 2-3 laboratory hours per semester.

Grade point average computations are carried to the third decimal place from which rounding takes place to the second decimal place. For example, a computed grade point average of 2.994 will be rounded down to 2.990. A computed grade point average of 2.995 will be rounded up to 3.000. On all official LIU transcripts, a grade point average will be displayed to three decimal places with the third decimal place always being zero due to rounding.

To graduate, a student must have a grade point average of no less than 2.330 in all work and 2.330 in the professional coursework.

## Academic Standards

The College reserves the right to dismiss, suspend, or probate, at any time, a student whose academic record is unsatisfactory. Prior notification or prior academic probation is not a necessary precursor to academic dismissal or suspension of students who have unsatisfactory academic records or progress. Any student who at any time fails to demonstrate satisfactory progress as indicated below shall be subject to immediate academic dismissal or suspension upon determination or opinion of the College that the noncompliance with satisfactory progress is of such nature that a period of academic probation shall not be afforded to the student. To be in good standing, a student must make satisfactory progress toward fulfilling all requirements of the program in which he or she is enrolled. Failure to do so will be cause for academic dismissal.

Satisfactory progress is ordinarily demonstrated by completing the six-year Doctor of Pharmacy program in the projected six-year time frame; completing the necessary required and elective courses; maintaining an overall cumulative grade-point average (G.P.A.) of 2.330 or greater in all courses attempted; maintaining a cumulative grade-point average (G.P.A.) of 2.330 or greater in all professional pharmacy courses attempted that are herein prescribed for the third, fourth, fifth and sixth year of study; achieving a semester, term or session grade-point average (G.P.A.) of 2.330 or

greater for each semester, term or session attended; and satisfactory and timely completion of additional program requirements, such as completion of the LIU Brooklyn proficiency examinations in computer literacy, satisfaction of the requirements of the Writing Across the Curriculum Program and certification in cardiopulmonary resuscitation.

LIU Pharmacy is cognizant that there may be a variety of reasons why students may not complete the Doctor of Pharmacy program in the projected six-year time frame. Students who meet all other requirements for satisfactory progress ordinarily are not considered to be making unsatisfactory progress, should they require additional courses as a result of their LIU Brooklyn English and/or mathematics placement, should personal circumstances require a leave of absence from the College or a reduced schedule, if service requirements for students serving in the Armed Forces of the United States delay their progress, or if progress has been delayed as a result of unsatisfactory completion of course(s) or as a condition of required remediation due to the academic probationary status of the student. Upon entering the professional phase of the program (third year) the maximum allowable time for the completion of all requirements and the awarding of the Doctor of Pharmacy degree is six years for the projected remaining four years (third, fourth, fifth and sixth years), exclusive of time spent in the armed forces. Students may file a request for an extension of the maximum allowable time with the Assistant Dean. Students should include in their request an explanation of the circumstances under which they require an extension to complete their degree requirements. The Assistant Dean for Academic and Student Affairs will consider the request and may consult with the College's Scholastic Committee regarding the request. The student will be duly notified as to whether or not his or her request for an extension has been granted. Any courses outside the time limit will not count as credits toward the degree unless approved in writing by the Assistant Dean for Academic and Student Affairs.

Failure to satisfy any of the above-listed indicators of satisfactory progress is cause for academic dismissal, suspension or probation and any one or more of the three (dismissal, suspension, or probation) will be applied immediately upon failure to maintain satisfactory progress. If dismissal or suspension are not applied, then probation will apply.

Academic probation is most typically the initial official action for a student failing to make satisfactory progress. Every attempt is made by LIU Pharmacy to duly notify students that they have been placed on probation. Students in LIU Pharmacy, as students enrolled in a professional program, are expected to be fully aware of the requirements for satisfactory progress and are expected to be fully capable of determining whether their own academic progress is in

compliance with the requirements for satisfactory progress. As such, all students are further expected to understand that if academic dismissal or suspension is not immediately applied in their case that their status is probationary, whether or not they receive notification from LIU Pharmacy in that regard. All students failing to make satisfactory progress are expected to take initiative towards remediation of unsatisfactory progress.

## Academic Probation

Conditions of a student's academic probation are as follows:

1. Typically, the maximum number of semesters, terms or sessions exclusive of summer sessions, of academic probation permitted is two during the pre-professional phase (P-1 & P-2) of study and two during the professional phase (P-3, P-4, P-5 and P-6) of study. The two semesters may be either consecutive or separate. Any student who is on or qualifies for probation for a third semester in either the preprofessional phase or professional phase of study will, with great probability, be academically dismissed from the College. On rare occasions, upon review by the Assistant Dean for Academic and Student Affairs and/or the College's Scholastic Committee, additional semesters, terms or sessions of academic probation may be afforded the student in order for the student to remedy his or her noncompliance with the standards of satisfactory academic progress. When such extension of academic probation is granted, it shall not be construed that further extensions will be granted or that the possibility of academic dismissal or suspension is lessened should noncompliance with the standards of academic progress continue to exist at the conclusion of the probationary period extension. Students on extensions of academic probation are typically required to conform to a written agreement regarding their academic progress. Failure to achieve the levels of academic performance as specified in the agreement is cause for academic dismissal from the College.
2. Students who are not in compliance with the standards of academic progression for any reason are not permitted under any circumstances to enroll and/or participate in any courses with experiential components. Students who come into noncompliance with the standards of academic progression at any time that they may be enrolled or participating in any courses with experiential components will immediately be required to withdraw from those courses and will not be permitted to re-enroll or participate in such courses until their noncompliance with the standards of academic progression are remedied.
3. A student who has been placed on academic probation is limited in participation in extracurricular activities. A probationary

student may hold membership in clubs, organizations and fraternal societies. A probationary student is barred from holding any office, chair or committee seat in such clubs, organizations and fraternal societies. A probationary student may attend lectures and other events sponsored by such clubs, organizations and fraternal societies and/or by the College that are deemed to be of an educational nature.

4. A student on academic probation is/ may be required to participate in academic counseling and/or enroll in a remedial program of study.

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## Academic Suspension

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Academic suspension may occur in those cases when it is the determination of LIU Pharmacy that the particulars of a student's failure to achieve satisfactory progress are of such nature that a period of time away from the College would likely improve the prospects for remediation of unsatisfactory progress when the student is permitted to resume his/her studies. By way of example, academic suspension might be prescribed when a student indicates that his/her failure to maintain satisfactory progress is due to some type of personal circumstance, such as infirmity, family problems or economic difficulties. In such cases, the College may require a period of academic suspension of from one-to-two semesters of study until such time that the extenuating causes that have been determined to be factors in the student's unsatisfactory progress have been reasonably ameliorated. Academic suspension may also be applied when the student's academic difficulties have created a situation where he/she may need to repeat courses in order to meet the prerequisite qualifications to move forward into the next term of study.

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## Academic Dismissal

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The College reserves the right, as previously noted, to academically dismiss a student at any time if a determination is made, after a thorough review by the Assistant Dean for Academic and Student Affairs and/or the Scholastic Committee of the College, that the student's academic record is unsatisfactory or otherwise does not comply for any reason with the standards of satisfactory academic progress. Typically, academic dismissal occurs whenever a determination has been made by LIU Pharmacy that a student's failure to maintain satisfactory progress is of such severity or length of time, as defined by the following guidelines, that the student should be permanently withdrawn from the College. When applying a standard of length of time to an academic dismissal, except in those rare instances, as noted above, where an extension of academic probation may be granted, dismissal will be applied whenever the student has maintained, for two semesters, an overall cumulative grade-point

average (G.P.A.) of less than 2.330 in all courses attempted, two semesters of maintaining a cumulative grade-point average (G.P.A.) of less than 2.330 in all professional pharmacy courses attempted that are herein prescribed for the third, fourth, fifth and sixth year of study, or two semesters, terms or sessions accumulating two instances of a grade-point average (G.P.A.) of less than 2.330 for a semester, term or session attended. When applying a standard of severity to an academic dismissal, a dismissal may be applied at any time that a student has acquired an overall G.P.A. of 1.750 or less in all courses attempted or a G.P.A. of 1.750 or less for a semester, term or session attended. For students in the professional phase of the program (3rd, 4th, 5th or 6th year) academic dismissal may be applied if the G.P.A. in all professional courses attempted that are herein prescribed for the third, fourth, fifth and sixth year of study is 1.750 or less after one semester of study in the professional phase, 1.950 or less after two semesters of study in the professional phase, or 2.200 or less after three or more semesters of study.

A student may appeal an academic dismissal once by petition to the Scholastic Committee of the College. The petition should present a thorough analysis by the student of the reasons for having failed to maintain satisfactory academic progress and a comprehensive plan for rectifying his/her deficiencies within a reasonable period of time, preferably after one semester of study but not exceeding two semesters of study, and that conforms with all other academic regulations of the College. The petition is considered by the Scholastic Committee which may request that the student appear before this committee to substantiate his/her position and answer questions. The Committee then makes its recommendations on the petition to the Assistant Dean for Academic and Student Affairs. Students are advised that successful appeals of academic dismissals are rare and usually occur only in those circumstances where substantive underlying causes for unsatisfactory academic progress were previously unknown to the College. Generally, as noted above, in cases where substantive underlying causes exist for unsatisfactory progress, an extension of academic probation will have been granted to allow the student additional opportunity to remedy his/her noncompliance with satisfactory academic progress. Decisions of the Scholastic Committee and/or the Assistant Dean for Academic and Student Affairs that a student believes may demonstrate arbitrary and capricious treatment or to be fundamentally unfair may be appealed, as a final step, to the Dean of LIU Pharmacy.

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## Academic Status

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**Third-Year Student:** A student who has completed the preprofessional requirements with a minimum G.P.A. of 3.000.

**Fourth-Year Student:** A student who has finished all third-year courses with a minimum G.P.A. of 2.330.

**Fifth-Year Student:** A student who has completed all fourth-year courses with a minimum G.P.A. of 2.330.

**Sixth-Year Student:** A student who has completed all fifth-year courses with a minimum G.P.A. of 2.330.

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## Prerequisites

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Students are not permitted to register for any professional course unless all science and math and 21 Liberal Arts prerequisites have been successfully completed. Students are responsible for knowing the prerequisites for courses as stated in this bulletin. Students found to be enrolled in a course for which they have not met the prerequisites will be withdrawn from the course regardless of the point in that course where the discovery is made. Students are advised that the lack or the failure of a prerequisite course may significantly impede their academic progress by preventing their enrollment in one or more subsequent courses. Many courses are offered only once a year; hence failure of a course may result in a delay of a year until such course is repeated and the student is authorized to enroll in subsequent courses.

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## Withdrawal from All Courses

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Students in good academic standing who wish to spend a period of time away from the College or students who are on academic probation and who want to withdraw from all classes must give a valid reason and (a) obtain, from the Office of the Registrar, an Application for Permission to Withdraw, complete it, as indicated, and have it approved by the Assistant Dean for Academic and Student Affairs, and (b) clear their financial account.

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## Withdrawal from One or Several Courses

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When students are registered for a course, they are considered to be in attendance until the date of their official withdrawal.

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## Readmission

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If a student has been in good academic standing, has withdrawn from all courses and desires to return to LIU Pharmacy within one year of his/her withdrawal, he/she may be considered for readmission by completing an application for readmission, available from the Admissions Office, subject to approval of the Assistant Dean for Academic and Student Affairs. Students are advised that readmission is not guaranteed except in such cases where a leave of absence has been

granted by the Assistant Dean for Academic and Student Affairs and then only within the time frame established for the leave of absence. Students who have been withdrawn from the College for more than one year are generally not granted readmission. Such time limits do not apply to students who have been fulfilling service requirements in the Armed Forces of the United States.

If a student has been suspended or dismissed for disciplinary reasons and desires to return to LIU Pharmacy, his/her application for readmission is referred to the Office of the Assistant Dean for Academic and Student Affairs. The Assistant Dean's office will advise the student of the following procedure which may be required for readmission: the student may be granted a hearing by the appropriate faculty committee for consideration of action on his/her readmission application. The student is required to submit a written petition stating the nature of his/her problems and a workable solution to those problems. The application for readmission and the petition are then considered by the appropriate faculty committee. The student may be requested to appear before this committee to substantiate his/her position and answer questions. The committee then makes its recommendations and/or recommends performance conditions on the readmission application to the Assistant Dean for Academic and Student Affairs. The College is not obligated to reconsider an application for readmission.

If a student has been on academic probation, has withdrawn from all classes and desires to return to LIU Pharmacy, his/her application for readmission is referred to the Assistant Dean for Academic and Student Affairs. The Assistant Dean's office will advise the student of the procedure described above, which may be required for his/her readmission. If the Assistant Dean approves the recommendations of the committee for readmission, such student will be readmitted and is on probation.

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## Registration and Advisement

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Students may register either online or in-person. Students should routinely and closely monitor notifications while they are logged into MyLIU.edu regarding on-line appointment dates and times for self-service registration for upcoming academic terms. Students desiring to register in-person should make appointments with academic advisers in the College's Office of Student and Professional Affairs during the registration periods specified in the published academic calendars.

Academic advisers are available at all times during normal business hours to assist students with issues regarding class selection and scheduling as well as academic progress. Advisers also provide guidance to students in matters regarding academic probation.

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## Graduation Requirements

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Upon recommendation of the faculty and approval by the Board of Trustees, the Doctor of Pharmacy is conferred by LIU upon a candidate who has met the following requirements:

1. Satisfactory completion of the full prescribed curriculum (214 credits) or two or more years in this College and the required equivalent courses in some other registered and accredited college of pharmacy, or departments of a university.
2. Maintenance of a 2.330 or "C+" cumulative grade-point average (G.P.A.) in all preprofessional course work completed and, separately, in the professional courses offered in the years P-3 through P-6.
3. Satisfactory demonstration of computer competency.
4. Satisfactory completion of the minimum requirements of the Writing Across the Curriculum program or equivalent coursework as defined by the College.
5. Settlement of all accounts with the University, including the graduation fee.
6. Evidence of good ethical and professional character.

Students have until the time of their graduation to have changes made on their academic records. Once a student has graduated, the academic record cannot be changed retroactively.

## Awards

### College Gold Medal

This award is given to the student having the highest general standing in the third, fourth, fifth and sixth year's work.

### College Silver Medal

This award is given to the student having the second highest general standing in the third, fourth, fifth and sixth year's work.

### College Bronze Medal

This award is given to the student having the third highest general standing in the third, fourth, fifth and sixth year's work.

### Arnold & Marie Schwartz College of Pharmacy and Health Sciences Professionalism Award

This award will be given to a graduating senior who exhibits the ideals of professionalism by exceptional service and commitment to the profession of pharmacy through involvement in professional organizations or other extracurricular opportunities; has assumed a leadership role and maintained good academic standing.

### Anderson Award

This award is given to a student demonstrating superior achievement in Pharmaceutics III and IV.

### APhA-ASP Senior Recognition Certificate

The American Pharmacists Association honors a graduating student member who has made the greatest contribution to his or her APhA-ASP chapter, with a Senior Recognition Certificate.

### Pola and John Bradman Award in Leadership and Service

This award is given to a graduating student who has excelled in service and leadership by playing an active role on behalf of the student body, and who has maintained an index of 2.75 or better.

### Facts and Comparisons Award of Excellence in Clinical Communication

Recognizes high academic achievement and outstanding clinical communication skills.

### Irwin and Lenore Gerson Award

This award is given to a graduating student for qualities of leadership and excellence in pharmacist/patient communication.

### Seymour Katz Memorial Award

This award, established by The Royal Counties of New York Society of Hospital Pharmacists, in memory of Seymour Katz, FASHP, M.S.'74, is presented to the editor of the College Yearbook.

### Professor Shirley Kraus Research Award

A plaque awarded to an entry-level Doctor of Pharmacy degree candidate who has conducted a

research project under the supervision of a faculty member in the Division of Pharmaceutical Sciences.

### Lilly Achievement Award

A medallion award and the most recent edition of the USP DI Reference Book are given for superior scholastic and professional achievement, and qualities of leadership.

### Membership in the Pharmacists Society of the State of New York

This award is presented to a graduating senior that has demonstrated an active interest in the profession, displayed capacity for leadership in the profession, and has a record for public service.

### Merck Awards

These awards are presented to outstanding students in pharmacy studies. The first award goes to a student who has demonstrated superior achievement in Medical Physiology, Pathophysiology, and Biochemical Foundations of Therapeutics; the second award to a student who has demonstrated superior achievement in Pharmacology and Medicinal Chemistry; the third award to a student who has demonstrated superior achievement in Medical Microbiology/ Immunology; and the fourth award to a student who has demonstrated superior achievement in Iatrogenic Diseases.

### Mylan Pharmaceuticals Excellence in Pharmacy Award

This award is presented to a student in the top 25 percent of his/her class academically, who has demonstrated high professional motivation and the intent to enter practice upon graduation.

### Natural Medicines Comprehensive Database Recognition Award

Presented to a graduating student who has exhibited an interest in the use of natural medicines, and whose academic and/or extracurricular activities demonstrate that the student exhibits outstanding promise in the assessment, evaluation, or delivery of patient care related to the use of natural medicines.

### Steven Strauss Pharmacy Law Award

This award is presented to a graduating student who has demonstrated superior academic achievement in pharmacy law courses, who exemplifies the highest principles of moral and ethical conduct, and who has played a leadership role among students.

### TEVA Pharmaceuticals USA Student Award

This award is given to a graduating student who excels in the study of pharmacy.

### The United States Public Health Service Excellence In Public Health Pharmacy Practice Award

This award is presented to a student who has shown excellence in educational and community-based programs to advance the goals stated in "Healthy People 2010."

### Lillian C. Zupko Memorial Award

This award is given to a student who has demonstrated superior achievement in Pharmaceutics V by the BCP Woman's Club of LIU Pharmacy.

### Stephen M. Gross Faculty Council Award

This award is given to a graduating student based on academic performance and professional motivation.

### The Arnold & Marie Schwartz College of Pharmacy and Health Sciences Mary M. Lai Community Service Award

This award was established in honor of Mary Lai '42, H'86 Senior Advisor and Trustee Emerita, in recognition of her generosity and responsiveness to the needs of others within and outside of the University community. The award recognizes a graduating student who volunteers his/her time, energy and talents in our college or community, motivates others to get involved and works with others to make a difference.

### Arnold & Marie Schwartz College of Pharmacy and Health Sciences Pharmacy Excellence Award

Candidates for this award must display a commitment to patient-centered care, show superior academic achievement and the ability to translate clinical knowledge into practical patient care. Special consideration will be given to a student interested in pursuing post graduate training/education.

### Arnold & Marie Schwartz College of Pharmacy and Health Sciences Excellence in Pharmacotherapy

This award recognizes a graduating senior with high academic achievement in the Pharmacotherapeutics course series and who demonstrated outstanding promise in the delivery of patient-centered care.

### Alumni Association Board of Directors Professional Excellence Award

This award will be given to a graduating sixth year student who has a G.P.A. of 3.0 or higher and exhibits a commitment to volunteerism through a record of service to the College, colleagues, community and profession.

## Degrees with Distinction

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Students who have completed at least 60 percent of their credits in residence at the College and have achieved a grade-point average of 3.500, 3.700, or 3.800 may receive, upon a majority vote of the faculty, a Doctor of Pharmacy degree cum laude, magna cum laude, or summa cum laude, respectively.

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## Pharmacist Licensing

### Examinations

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Holders of the Doctor of Pharmacy degree who have fulfilled all scholastic requirements may sit for state board of pharmacy licensing examinations. Graduating students are advised to carefully consult with the boards of pharmacy in the states they are considering to obtain licensure to ensure they comply with regulations concerning internship and licensure requirements.

In compliance with accreditation guidelines LIU Pharmacy regularly makes available recent passing rates of graduates taking the national standardized licensure examination North American Pharmacist Licensure Examination (NAPLEX) and the Multistate Pharmacy Jurisprudence Examination (MPJE) for the first time. Passing rates for first time takers for the most recently available reporting periods are presented below:

NAPLEX Reporting Period	% Passing
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2008	92.45%
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2009	87.8%
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2010	83.17%
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2011	87.17%
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2012	94.09%
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MPJE Reporting Period	% Passing
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2008	91.28%
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2009	90.61%
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2010	93.44%
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2011	90.06%
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2012	96.75%
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## INTEGRATED STUDENT FINANCIAL SERVICES

Through a mix of personal and online services, the Office of Integrated Student Financial Services has developed a system that supports our students in managing all aspects of financing their education. The goals and objectives of the Office is to help students obtain maximum eligible financial aid awards, provide comprehensive counseling sessions, optimize payment arrangements, disseminate financial aid and billing information clearly and understandably, support the University's mission of access and excellence, and increase and assist in student retention efforts.

Using the University's convenient My LIU portal at <https://my.liu.edu>, you can view your financial aid status and account activity, pay your bill online, make online appointments with counselors, and view "to do" items and "holds" that help you complete required tasks to ensure your continued enrollment at LIU Brooklyn. In addition to our online student portal, our experienced financial aid counselors will work closely with you and your family to ensure you receive world-class service throughout your college experience.

## PROFESSIONAL PROGRAM TUITION AND FEES

Students are billed for tuition and fees at the time of registration. Room and board charges are reflected at the time of room assignment. **Students must make satisfactory payment arrangements prior to the start of each term or before moving into residence halls to remain in good financial standing.**

### General Tuition and Fees

Pharmacy, Pharm.D. Program Years

1-2:

Tuition per credit, per semester (less than 12 credits)	1,010.00
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Tuition, flat rate, per semester (12 or more credits)	16,185.00
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Pharmacy, Pharm.D. Program Years

3-5:

Tuition per credit, per semester (less than 12 credits)	1,196.00
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Tuition, flat rate, per semester (12 or more credits)	19,137.00
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Pharmacy, Pharm.D. program Year 6:

Tuition per academic year (includes Summer term)	40,350.00
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Tuition Deposit fee (nonrefundable)	200.00
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Application fee (nonrefundable)	50.00
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Flex Dining Dollars (9+ credits, 50.00 dining dollars/FALL 2013 term only)	25.00
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University fee, per semester:

Students carrying 12+ credits per term	850.00
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Less than 12 credits per term	425.00
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Audit fee (Graduate Audit Fee)	555.00
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Life Experience fee:

per credits	250.00
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Pharmacy Professional fee, per term	45.00
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Course fees, per semester (see course descriptions)

### Residence Life

#### RESIDENCE HALLS

Deposit (submitted with housing application)	\$ 300.00
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Fall and Spring Accommodations, per semester:

Standard Conolly:

Double	3,682.00
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Triple	2,775.00
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Suite Conolly:

Double	4,386.00
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Triple	4,008.00
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Quad	4,182.00
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Apartment Conolly:

Double	5,365.00
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Triple	4,886.00
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Quad	5,518.00
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Suite Hoyt:

Double	5,447.00
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Triple	5,161.00
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Quad	5,335.00
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Quintuple	5,732.00
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Apartment Hoyt:

Double	6,895.00
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Triple	6,895.00
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Fulton Apartment:

Studio	9,400.00
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1 Bedroom	10,275.00
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2 Bedroom	9,600.00-10,600.00
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3-6 Bedroom	8,961.00 - 9,373.00
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Intersession (per week)	268.00
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Summer Accommodations, per session:

Suite Conolly:

Double	1,755.00
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Triple	1,685.00
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Quad	1,612.00
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Apartment Conolly:

Double	2,010.00
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Triple	1,867.00
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Quad	1,785.00
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Suite Hoyt:

Double	2,377.00
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Triple	1,795.00
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Quad	2,142.00
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Quintuple	2,458.00
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Apartment Hoyt:

Double	2,765.00
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Triple	2,510.00
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MEAL PLANS, per term	
Fall and Spring, per term:	
Residential Meal Plan 1	2,350.00
(unlimited Meal plus 300.00 Flex Dining Dollars)	
Residential Dining Dollars	300.00

Resident students not living in apartment accommodations are required to participate in a meal plan. Declining dollars can be used at point of sale locations across the campus.

**Other Fees**

Transcript of record (on-line, in person, or via mail), per request	\$7.00
Replacement I.D. card	25.00
Late graduation application fee	50.00
Reinstatement of cancelled registration	100.00*
Delayed registration fee	200.00*
Late payment fees:	
First (assessed 45 days into the term)	50.00*
Second (assessed on the last day of the term)	100.00*
Deferred final examination fee per examination	
(maximum \$60.00)	20.00
General Comprehensive Examination fee	25.00
Returned check fee	25.00
University Payment Plan fee	35.00
Diploma Replacement fee	35.00

Repayment of returned checks and all future payments to the University from a student who has presented a bad check must be tendered via bank check, certified check, money order, AMEX, VISA, Discover or MasterCard.

\*Students are expected to clear their bills before the start of classes. In the event that a student fails to do so, late payment fees will be assessed. Registered students who have not cleared their bill by the 45th day into the term will be obliged to pay a late payment fee of \$50.00. Bills not cleared by the last day of the term will be assessed an additional late fee of \$100.00. If a student's registration is canceled, the student will be required to pay a reinstatement fee of \$100.00 plus the late payment fees. If the reinstatement takes place one year or more after the semester has ended, current tuition rates will be charged. Any student who deliberately fails to register but attends classes with the intention of registering late in the term will be responsible for paying the delayed registration fee of \$200.00. If the registration takes place one year or more after the semester has ended, current tuition rates will be charged.

**Student Health Insurance**

Health Insurance:

Rates for the Annual Plan	1,599.00
Rates for the Spring Semester (newly enrolled students), covers the policy period 1/1/14 - 8/14/14	1,030.00
Rates for the Summer Semester, covers the policy period 5/1/14- 8/14/14	452.00
Pharmacy malpractice insurance fee, per term (years 3-6)	12.00

Health insurance (Compulsory for domestic resident students, all international students, intercollegiate athletes, and students assigned field work in a health care curriculum). Charges are billed for an annual plan in the Fall semester, covering the policy period 8/15/13 - 8/14/14. Charges are not reduced if a student does not reside in the Residence Hall for the Spring semester, or is no longer in a health care curriculum, since coverage continues to be effective over the full policy period.

**Withdrawal Policy**

If you register for courses and decide not to attend, you must officially withdraw your registration prior to the end of the first week of classes to avoid liability. You can withdraw online using your My LIU account through the first week of the term. After the first week of classes, you must complete an **Application for Withdrawal Form** and receive official approval from the Office of the Registrar on your campus. **Non-attendance and/or non-payment do not constitute official withdrawal from the University.**

When a student withdraws, the University will refund tuition and fees as indicated in the following schedule.

**LIU Institutional Refund Schedule**

<b>Time of Withdrawal</b>	<b>Fall/Spring terms</b>
Cancellation prior to beginning of term or session	Complete refund except for deposit.
During 1st calendar week	100%
During 2nd calendar week	75%
During 3rd calendar week	50%
During 4th calendar week	25%
After 4th week	No refund

<b>Time of Withdrawal</b>	<b>3-Week terms</b>
Cancellation prior to beginning of session	Complete refund except for deposit.
Day 1 of Term	100%
Day 2 thru 8 of Term	60%
After Day 8 of the Term	No refund

<b>Time of Withdrawal</b>	<b>4-, 5- or 6-Week terms</b>
Cancellation prior to beginning of semester or session	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	60%
Day 10 thru 16 of Term	25%

After day 16 of the Term	No refund
<b>Time of Withdrawal</b>	<b>7- or 8-Week terms</b>
Cancellation prior to beginning of session	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	70%
Day 10 thru 16 of Term	30%
After day 16 of the Term	No refund

<b>Time of Withdrawal</b>	<b>10- or 12- Week terms</b>
Cancellation prior to beginning of session	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	80%
Day 10 thru 16 of Term	60%
Day 17 thru 23 of Term	25%
After day 23 of the Term	No refund

<b>Time of Withdrawal</b>	<b>Weekend College</b>
Cancellation prior to beginning of term	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	70%
Day 10 thru 16 of Term	30%
After Day 16 of the Term	No refund

<b>Time of Withdrawal</b>	<b>Short-Term Institutes (3 weeks or less)</b>
Cancellation prior to beginning of first class	Complete refund except for deposit.
Day 1 of Term	100%
Day 2 of Term	80%
After Day 2 of the Term	No refund

<b>Time of Withdrawal</b>	<b>Continuing Studies</b>
Cancellation prior to beginning of first class	Complete refund except for deposit.
Prior to start of second class	80%
After second class session	No refund

The University will make all feasible efforts to conduct suitable academic services in the event of an unanticipated interruption. If the University is unable to provide education services to the Campus students because of a natural catastrophe, employee strike, or other conditions beyond its control, tuition and fees will be refunded in accordance with a reasonable refund schedule to be determined at that time.

### Financial Obligations

Students are liable for all charges incurred at the time of registration or room assignment. Your My LIU account makes it easier than ever to manage your financial obligations. To view your current account balance, simply log into your My LIU account online at <https://my.liu.edu> and click on the **Account Inquiry** link in the **Finances** section of your **Student Center** homepage. Students must make acceptable payment arrangements or officially withdraw prior to the start of classes to remain in good financial standing. Acceptable payment arrangements include:

- Payment in full;
- Approved financial aid covering all charges;
- Signed and approved University Payment Plan Agreement Form; or
- Participation in an approved third-party payment agreement.

A student who complies with any of the above shall be considered in good financial standing, so long as all terms and conditions are met throughout the term. All payment arrangements must be completely satisfied in accordance with your University authorized payment agreement or fees and/or penalties may be applied. If your account becomes seriously past due and no arrangements are made, the University will refer it to an external collection agency or law firm, where additional fees and penalties may be charged to your account. The University's policies and procedures governing Student Financial Services can be found online at: [www.liu.edu/SFS](http://www.liu.edu/SFS)

### Payment Arrangements

LIU offers convenient options to pay your account balance due. We offer many different payment methods, including check, all credit and debit cards, ACH, money order, and wire transfer.

**My LIU:** You can use your My LIU account to securely pay your balance online at [my.liu.edu](http://my.liu.edu) using a check, credit or debit card by clicking on the **Make a Payment** link from your **Student Center** homepage or from within the **Account Inquiry** section. To log into the Payment Gateway, enter your My LIU user name and password. From here, you may also set up an authorized user account so that a relative, guardian, or employer can pay any outstanding balance on your behalf. If you need assistance with making a payment online, please visit the **Center for Student Information** website at <http://csi.liu.edu>.

**Payment by Mail:** If paying with a check or money order by mail, please date the payment appropriately and make it payable to **Long Island University**. Any payment not honored by the bank is subject to a \$25 returned item fee and may restrict your future payment options to certified check, money order, or credit card. You may also receive an additional charge from your financial institution. The University is not responsible for fees assessed by your bank.

**Third Party Payments:** The University will temporarily clear student account balances if presented with written authorization from a third party or sponsoring company that intends to make a payment on your behalf. Students must submit official written authorization and complete a Deferred Payment Plan Agreement Form, along with payment for any remaining balance due. Additional information on third party payments can be found online at [www.liu.edu](http://www.liu.edu).

### Payment Plans

The University offers two basic types of interest-free payment plans to assist students with managing the cost of their education each term:

- Monthly Plans are offered to students who make payment arrangements before the start of the term. Monthly Plans provide the most affordable payment options to our students and immediately place you in good financial standing. The balance is spread across 4-6 equal monthly installments with at least two payments due prior to the start of the term.
- Term Plans are offered to students who need to make payment arrangements at or after the start of the term. Term Plans should only be used as a last resort because the number of installments is limited to 2-3

monthly payments. In addition, your total balance due must be covered by an appropriate combination of approved aid, applied aid, and/or an initial student payment.

The University must approve your signed Payment Plan Agreement Form and receive your first initial payment for your account to remain in good financial standing. There is a \$35.00 enrollment fee per term that is due with your first payment.

## SCHOLARSHIPS AND FINANCIAL AID

Financial Aid is awarded on an annual basis in the form of scholarships, grants, loans and part-time employment. Since the Pharm. D. Program is six years in length, there are special considerations for financial aid funding that are outlined by the Federal government for the undergraduate component of the program vs. the graduate component.

### Application Process

All candidates for LIU scholarships or grants, Federal grant and loan programs, work-study opportunities, and New York State Tuition Assistance Program (TAP) grants are required to complete the Free Application for Federal Student Aid (FAFSA) each year. The FAFSA should be completed online at [www.fafsa.ed.gov](http://www.fafsa.ed.gov). The federal school code for the LIU Brooklyn campus is **002751**. Residents of New York State must also complete the Tuition Assistance Program (TAP) application using the LIU school code of **0403**. Continuing students at LIU must reapply for financial assistance each year.

Applicants for financial aid are expected to apply for Federal Pell Grants, and those who are legal residents of New York State are expected to apply for TAP awards. Applicants for financial aid may expect to be notified of the decision reached by the Office of Integrated Student Financial Services shortly after their files have been completed. No action will be taken until the candidate has been accepted by the Office of Admissions.

### Awards

#### LIU Scholarships and Awards

The LIU Brooklyn campus awards approximately \$50M in University scholarship assistance to students each year. These scholarships and grants, which do not require repayment, are based on academic success, athletic ability, community service, artistic talent, and financial need. The campus also offers honors and departmental scholarships for specific programs of study. A detailed listing of professional scholarships can be found online at [www.liu.edu/brooklyn/scholarships](http://www.liu.edu/brooklyn/scholarships).

In addition to University financial assistance, LIU Pharmacy provides additional aid in the form of scholarships funded through the generosity of alumni and friends. Awards are based on academic achievement and professional promise, as well as financial need. Interested students should submit a Pharmacy Scholarship Application prior to the start of each Fall semester for consideration. Additional information on these scholarships, including how to apply, can be found online at [www.liu.edu/pharmacy/scholarships](http://www.liu.edu/pharmacy/scholarships).

#### Federal and State Grants and Loan Programs

The Federal government awards financial assistance to students who demonstrate financial need according to a variety of economic criteria as determined by the United States Department of Education. The criteria include an individual and/or parents' income and assets, family's household size, and the number of family members attending college. Benefits from all federal programs are subject to legislative changes. Recipients of federal programs must be U.S. citizens or permanent residents. Federal financial aid programs such as the Federal Pell and SEOG Grant Programs are limited to the first four years of undergraduate study. Federal Direct Loan program amounts also differ for the undergraduate years vs. the graduate years.

The New York State Higher Education Services Corporation (HESC) also offers a wide variety of grants, scholarships, student loans and parent loans for part-time and full-time college study. HESC also administers the Tuition Assistance Program (TAP), the nation's largest state grant program. Grants and scholarships are types of aid that do not need to be repaid. Although students apply for financial aid directly to HESC, the funds are taken into account when developing the LIU financial aid package. You must be a U.S. citizen and resident of the State of New York to be eligible for HESC awards. Students who reside outside of New York State may be eligible for grants, scholarships and loans from their home state. Contact the Federal Student Aid agency at 1-800-433-3243 or [www.federalstudentaid.ed.gov](http://www.federalstudentaid.ed.gov) for more information. A detailed listing of New York State awards can be found online at [www.hesc.com](http://www.hesc.com).

A detailed listing of Federal and State programs, including Pell grants, SEOG awards, TAP, and Direct Loans, can be found online at [www.liu.edu/Brooklyn/Financial-Services/Scholarships-Grants-and-Loans/Federal-and-State-Sponsored-Grant-Programs](http://www.liu.edu/Brooklyn/Financial-Services/Scholarships-Grants-and-Loans/Federal-and-State-Sponsored-Grant-Programs).

#### Veteran Benefits

The LIU Brooklyn campus has a proud and distinguished history of serving its nation's military veterans and active duty service members. Our supportive community of staff and faculty is dedicated to seeing veterans succeed in their education, career and life. To accomplish this mission, LIU Brooklyn provides the resources needed to pursue educational opportunities while balancing the demands of life both inside and outside the classroom.

With the Post-9/11 GI Bill, education-related benefits, including funds for tuition, housing, books and supplies, are better than ever for our veterans. In addition, financial aid, scholarships and New York State tuition awards and grants may also be available to help you with costs that are not covered by your veteran benefits. Additional information can be found online at

[www.liu.edu/Brooklyn/StudentLife/Veterans](http://www.liu.edu/Brooklyn/StudentLife/Veterans).

#### Private Loans

If you find that you need funding beyond the limits of the Federal Direct Student Loan Program, you may wish to consider a Private Loan. These loans are not guaranteed by the Federal government and are considered private loans. We urge all students and parents to research any lender they are considering for this type of funding and to specifically ask a number of key questions, including:

- current interest rates
- co-signer requirements
- repayment options, both in school and out
- whether or not the loan may be sold to another provider

The University does not have a preferred lender for private loans; each student has the right to select the educational loan provider of his or her choice. However, there are a number of independent resources that can be used to evaluate and analyze alternative loan options.

If you have considered applying for a private loan, you may be required to complete the Free Application for Federal Student Aid at [www.fafsa.ed.gov](http://www.fafsa.ed.gov) in order for the University to certify your loan eligibility. Alternative loans that are used to cover prior semesters may require additional information for approval, such as letters certifying indebtedness, attendance verification, official transcripts, etc. As such, when requesting funding for prior terms, be sure to reference the correct academic year on your application.

The basic process involved with securing private loans is the electronic filing of an application, institutional certification, and approval information. Generally speaking, electronic filing processing requires at least 72 hours before a lender will respond. The University will assist you in this process and will determine for you the maximum loan amount you will be allowed to borrow based on your estimated cost of attendance and pre-existing financial aid awards. The complete process normally takes 7-14 business days.

### Terms and Conditions

Awards are not finalized until all requested supporting documentation has been properly submitted and reviewed. All awards are subject to funding levels and appropriations by Federal and State agencies. Many aid programs require that you be matriculated and attend the LIU Brooklyn campus on a full-time basis. LIU reserves the right to adjust or cancel offers of financial assistance if you make changes to your FAFSA, adjust your registration status, withdraw from one or more courses, or fail to maintain good academic standing for financial aid purposes. LIU also reserves the right to change the selection criteria, deadlines, and awarding process of academic awards.

Awards, grants, and scholarships listed are for

professional study only and do not apply to LIU Global, undergraduate, and graduate studies. Such students should refer to the appropriate Bulletins for these programs of study.

Recipients of Federal and State financial aid must maintain full-time student status to receive the maximum benefits from these programs. Students who withdraw and/or drop their registration below full-time status must have their current and future financial aid eligibility re-determined. All awards from the LIU Brooklyn campus are accompanied by a letter of stipulation detailing the terms of the award. Students are governed by the stipulations accompanying their specific awards. Full-time status, for the purpose of scholarship and grant renewal, is defined as carrying and earning a minimum of 12 credits per semester.

Unless otherwise indicated, University assistance is for tuition charges only. Students are advised to inform LIU of any aid received from outside sources, and awards from LIU may be adjusted if such additional assistance is in excess of estimated need.

## Standards for Satisfactory Academic Progress

### Federal Financial Aid Programs

Federal regulations require students to make satisfactory academic progress (SAP) toward the completion of a degree or certificate program in order to receive Title IV financial aid, which includes the Federal Pell Grant, Federal SEOG, Federal Work Study, Federal Perkins Loan and the Federal Direct Loan Programs. Satisfactory academic progress is measured qualitatively and quantitatively by two components: a student's cumulative grade point average (G.P.A.) and the amount of credits they have earned relative to their year in school and enrollment status.

Satisfactory academic progress is measured annually, at the end of the Spring semester, after all grades have been submitted. Students failing to meet the criteria stated below are eligible to appeal this decision if extenuating circumstances played a factor in their academic performance. Examples of such circumstances could include an illness, accident, separation or divorce, or the death of a relative. An appeal must be made in writing to the University and include an explanation of the circumstance(s) that may have adversely affected the student's ability to meet the academic requirements, and the plan or changes that have occurred which will allow them to make SAP in the future. All appeals must be accompanied by supporting documentation, such as a letter from a doctor or attorney. If an appeal is granted, the student will either be placed on probationary status for one semester during which the student must meet SAP guidelines, or must successfully adhere to an individualized academic plan that was developed for them by their academic advisor as

part of their appeal. Failure to meet these criteria will result in loss of eligibility for Title IV funds.

Students wishing to receive Title IV financial aid for Summer semesters may have these awards evaluated and offered prior to a determination of SAP. All students receiving summer aid will have their SAP evaluated after all spring grades have been submitted. Students not making progress will have their summer aid cancelled, and the student will be liable for all tuition and fee charges incurred unless an appeal is filed and granted as outlined above.

The criterion below outlines the progress that is required for a full time professional student to be considered in good standing:

### SAP Completion Requirements

Number of Credits Attempted	Number of Credits Earned
0-29	50%
30-208	67%
209 and above	80%

### SAP G.P.A. Requirements

Total Credits Earned	Cumulative G.P.A. Required
0-29	1.8
30-60	1.9
60-138	2.0
139 and above	2.33

### Notes:

- Progress standards for part-time students are prorated based upon the criteria above.
- Qualifying transfer credits are counted as both attempted and earned credits but have no effect on the G.P.A.
- Grades of W (Withdrawal), UW (Unofficial Withdrawal), ABS (Absent), INC (Incomplete), and IF (Incomplete Fail) are counted as credits attempted but not completed, and do not affect the G.P.A.
- Repeated classes will count only once towards credits completed. A student may receive aid for a repeated class that has been successfully completed once.
- Students may not receive Federal aid for classwork that exceeds 150% of their degree requirements.
- Any departmental requirements that exceed these standards must be adhered to for the purposes of evaluating SAP.

### New York State TAP Awards

To receive financial aid awards from New York State, including Tuition Assistance Program (TAP) funding, students must meet the academic standing requirements established by the New York State Education Department. These requirements are different than those set forth by the Federal government, and apply only to New York State awards.

The basic measures for good academic standing for TAP Awards include the following:

- Pursuit of Program: A student must receive a passing or failing grade (A-F) in a certain percentage of courses each term.
- Satisfactory Academic Progress: A student must accumulate a specified number of credits and achieve a specified cumulative grade point average (G.P.A.).

The requirements for meeting these standards increase as the student progresses, and are based upon the number of State awards that the student has already received. Students failing to meet the established criteria are eligible to request a one-time waiver of the academic and/or "C" average requirement(s) if extenuating circumstances played a factor in their academic performance. Examples of such circumstances could include an illness, accident, separation or divorce, or the death of a relative. An appeal must be made in writing to LIU and include an explanation of the circumstance(s) that may have adversely affected the student's ability to meet the academic requirements, and the plan or changes that have occurred which will allow them to make SAP in the future. All appeals must be accompanied by supporting documentation, such as a letter from a doctor or attorney. If a waiver is granted, the student will be eligible for the State award for the semester for which they were granted the waiver. The student must continue to meet the academic progress and pursuit of program requirements to receive further awards.

The charts below outline the progress that is required for a professional student to be considered in good standing:

### Baccalaureate Semester Based Program Chart (2006 Standards)

*Applies to students first receiving aid in 2007-08 through and including 2009-10 and remedial students first receiving aid in 2007-08 and thereafter.*

Semester	Before Being Certified for Payment:	
	A student must have accrued at least this many credits	With at least this G.P.A.
1st	0	0
2nd	3	1.1
3rd	9	1.2
4th	21	1.3
5th	33	2.0
6th	45	2.0
7th	60	2.0
8th	75	2.0
9th	90	2.0
10th	105	2.0

**Baccalaureate Semester Based Program Chart  
(2010 Standards)**

*Applies to non-remedial students first receiving aid in 2010-11 and thereafter.*

Semester	Before Being Certified for Payment:	
	A student must have accrued at least this many credits	With at least this G.P.A.
1st	0	0
2nd	6	1.5
3rd	15	1.8
4th	27	1.8
5th	39	2.0
6th	51	2.0
7th	66	2.0
8th	81	2.0
9th	96	2.0
10th	111	2.0

**Notes:**

- All students must be registered for a minimum of 12 credits per semester.
- A student may not receive a NY State award for repeating a class that they have already successfully completed (i.e., the credits for a repeated class for which the student has already received a satisfactory grade will not count towards the full-time requirement).
- The standards that a student must meet are dependent upon when a student first received an award from NY State, as well as their remedial status.
- A student is placed on the chart above based upon their total TAP points received, including any award(s) received at a previous institution(s).
- To continue to receive TAP funding, a minimum number of credits must be completed each term, as well as on a cumulative basis.
- A student must maintain a minimum grade point average (G.P.A.) prior to being certified for a TAP payment. This average increases as the student progresses in payment points.
- All students must have a cumulative G.P.A. of 2.0 (a "C" average) or better after accumulating 24 or more payment points (e.g., 4 full time semesters).
- A student who is not making progress, and/or is not meeting the "C" average requirement may request a one-time waiver if extenuating circumstances affected their academic performance. A student may only receive this waiver once for NY state awards.

**GRADUATE PROGRAMS**

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LIU Pharmacy offers graduate curricula leading to the Doctor of Philosophy in Pharmaceutics (Ph.D.) degree, and the Master of Science (M.S.) degree in the following fields, as registered with the New York State Education Department: Pharmaceutics (with specializations in Industrial Pharmacy and Cosmetic Science), Pharmacology/Toxicology, and Drug Regulatory Affairs.

## GRADUATE CURRICULUM

### Division of Pharmaceutical Sciences

All graduate programs offered through LIU Pharmacy's Division of Pharmaceutical Sciences.

*Division Director*

**Anthony J. Cutie, Ph.D.**

Telephone: 718-488-1101

*Assistant Division Director*

**Rutesh Dave, Ph.D.**

Telephone: 718-488-1660

### Doctor of Philosophy Degree in Pharmaceutics

*Program Director*

**Rutesh Dave, Ph.D.**

Telephone: 718-488-1660

The doctoral program in Pharmaceutics at LIU is designed to prepare students to meet the challenges and the current needs of scientists engaged in the pharmaceutical sciences and drug development process. This program offers a blend of didactic and elective courses in the basic material sciences and mathematics, drug delivery, biopharmaceutics/pharmacokinetics, and other areas related to academic and industrial research. After completing a broad-based core of fundamental courses, all students are required to perform original research in a specialized area, culminating in a dissertation. The program is designed so Ph.D. students have considerable flexibility in selecting areas of research for the Ph.D. project.

At the end of the program students will:

1. Apply advanced biopharmaceutical principles involved in absorption, distribution, metabolism and excretion and use appropriate mathematical models to describe them.

1.1 Given drug concentration/time profile data the students should be able to:

1.1.1 Select the most appropriate method to calculate the following pharmacokinetic parameters: half-life, clearance, volume of distribution;

1.1.2 Determine the type of distribution (instantaneous versus slow);

1.1.3 Identify types of elimination (first-order or non-linear);

1.1.4 Identify types of absorption;

1.2 Be able to design/interpret experiments to detect dose and time dependencies;

1.3 Be able to design/interpret experiments to assess whether the drug is eliminated primarily by renal excretion or hepatic metabolism;

1.4 Be able to discuss the concept of

bioequivalence in accordance with FDA requirements;

1.5 Be able to design/interpret experiments to assess drug bioavailability and bioequivalence;

1.6 Describe a pharmacokinetic/pharmacodynamics (PK/PD) system

1.7 Describe and discuss different PK/PD models;

1.8 Possess basic knowledge of the physiological processes affecting drug absorption, distribution, metabolism, and excretion;

1.9 Be able to design/interpret clinical/preclinical experiments;

1.10 Describe, discuss, and apply different IVIVC models.

2. Apply the physicochemical principles involved in the design, evaluation and optimization of dosage forms.

2.1 Describe physical mechanisms governing how a particular dosage form works;

2.2 Interpret in vitro dissolution profiles from a dosage form;

2.3 Describe physical and chemical properties of solvents and solutes and relate them to solubility and/or dissolution of drugs;

2.4 Design experiments and interpret data to evaluate chemical stability of dosage forms;

2.5 Describe polymorphisms and how to evaluate their effects on physical stability of solid dosage forms;

2.6 Describe the physicochemical mechanisms of solubility enhancement in solid dosage forms, and how they relate to formulation and dissolution evaluation;

2.7 Describe and evaluate factors differentiating in vitro dissolution with in vivo performance of dosage forms;

2.8 Be able to derive 1st and 2nd order differential equations;

2.9 Be able to understand properties of molecules based on their chemical structures;

2.10 Utilize organic chemistry principles involved in chemical reactions.

3. Demonstrate ability to engage in independent original research.

3.1 Demonstrate the ability to form appropriate hypotheses;

3.2 Demonstrate the ability to design experiments appropriate to a given study;

3.3 Demonstrate the ability to obtain quality data using applicable equipment such as High Performance Liquid Chromatography (HPLC), Differential

Scanning Calorimetry (DSC), etc.;

3.4 Demonstrate the ability to analyze the experimental data, perform appropriate statistical analyses, and interpret results.

4. Develop the oral and written communication skills necessary to inform and educate professional and scientific peers.

4.1 Demonstrate the ability to evaluate information and write scientific documents;

4.2 Demonstrate ability to present scientific findings orally.

### Requirements for the Pharmaceutics Ph.D. Degree.

A minimum of 69 credits are required for the Pharmaceutics Ph.D. Degree.

Students must complete a minimum of 69 credits of course work including a minimum of four semesters of PHS 998 Ph.D. Research and Thesis, submit a satisfactory dissertation proposal, submit a satisfactory written dissertation and successfully defend (orally) their dissertation. For students starting the Ph.D. program beginning Fall 2014 and after a written comprehensive examination is required after completing the nine courses below indicated with an asterisk. Students must successfully pass this examination to qualify for continuation in the Ph.D. program.

### Pharmaceutics Ph.D. Course Requirements (For Students Starting the Program Fall 2014 and After).

All courses listed below are required.

PHS	602	Pharmaceutical Regulatory Overview*	3.00
PHS	931	Advanced Physical Pharmacy I*	3.00
PHS	932	Advanced Physical Pharmacy II*	3.00
PHS	934	Principles of Industrial Pharmacy I*	3.00
PHS	935	Principles of Industrial Pharmacy II*	3.00
MAT	610	Differential Equations I*	3.00
PHS	972	Methods of Pharmaceutical Analysis*	3.00
PHS	987	Advanced Biopharmaceutics and Pharmacokinetics*	3.00
PHA	010	Biostatistics*	3.00
CHE	621	Advanced Organic Chemistry I	3.00
PHS	990	Pharmacokinetic Modelling	3.00
PHS	936	Dosage Form Design	3.00
PHS	983	Polymer Science	3.00
PHS	997	Solid State Characterization	3.00

### Pharmaceutics Ph.D. Course Requirements (For Students Starting the Program Prior to Fall 2014).

All courses listed below are required.

BIO	692	Molecular Biology	3.00
CHE	621	Advanced Organic Chemistry I	3.00
MTH	610	Differential Equations I	3.00
MTH	611	Differential Equations II	3.00
PHS	701	Physical Chemistry I	3.00
PHS	702	Physical Chemistry II	3.00
PHS	880	Thermal Physics and Applications to the Chemistry of Pharmaceutical Systems I	3.00

PHS 901	Basic Pharmaceutics	3.00
PHS 972	Methods of Pharmaceutical Analysis	3.00
PHS 987	Advanced Biopharmaceutics and Pharmacokinetics	3.00
PHS 990	Mathematical Modeling	3.00
PHS 991	Solubility and Complex Equilibria	3.00
PHS 992	Transport Phenomena and Drug Delivery I	3.00
PHS 993	Kinetics and Mechanisms of Drug Degradation	3.00
PHS 994	Drug Stabilization	3.00
PHS 996	Intrafacial Phenomena	3.00
PHS 021	Seminar in Pharmaceutics (must register for a total of three semesters, one credit for each semester)	1.00

**Research (For All Ph.D. Students Regardless of Starting Date)**

**Students must register for a minimum of four semesters of PHS 998 (Minimum total of 12 credits)**

PHS 998	Ph.D. Research & Thesis	3.00
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**Students may choose from the elective courses listed below. Additional courses may be substituted for elective credit upon the approval of the program advisor.**

CHM 581	Computational Chemistry	3.00
CHM 606	Advanced Physical Chemistry	3.00
PHS 070	Special Problems	3.00
PHS 769	Transdermal Drug Delivery	3.00
PHS 881	Thermal Physics and Applications to the Chemistry of Pharmaceutical Systems II	3.00
PHS 886	Computational Methods of Data Analysis	3.00
PHS 931	Advanced Physical Pharmacy I (Required beginning Fall 2014 and after)	3.00
PHS 932	Advanced Physical Pharmacy II (Required beginning Fall 2014 and after)	3.00
PHS 934	Principles of Industrial Pharmacy I (Required beginning Fall 2014 and after)	3.00
PHS 935	Principles of Industrial Pharmacy II (Required beginning Fall 2014 and after)	3.00

PHS 936	Dosage Form Design (Required beginning Fall 2014 and after)	3.00
PHS 937	Pharmaceutical Engineering	3.00
PHS 950	Cosmetic/Dermatological Formulations and Technology I	3.00
PHS 951	Cosmetic/Dermatological Formulations and Technology II	3.00
PHS 955	Integrated Dosage Form Development	3.00
PHS 958	Aerosol Science and Technology	3.00
PHS 960	Properties/Applications of Cosmetic and Pharmaceutical Raw Materials	3.00
PHS 982	Science and Technology of Controlled Release Systems	3.00
PHS 989	Special Topics in Pharmaceutics	3.00
PHS 995	Transport Phenomena and Drug Delivery II	3.00

**Master of Science Degree - Pharmaceutics**

*Program Director*

**Rutesh Dave, Ph.D.**

Telephone: 718-488-1660

**Industrial Pharmacy**

The mission of the Master of Science in Pharmaceutics with specialization in Industrial Pharmacy is to uniquely prepare students for entry into the pharmaceutical industry and for entry to the Ph.D. programs in pharmaceutical sciences and other related fields. Graduates of the program will be highly sought after by the global pharmaceutical industry to support research, development and manufacturing operations. Alumni should become positioned to assume leadership positions within the pharmaceutical industry as well as within academia thus further elevating the stature of the Division of Pharmaceutical Sciences, LIU Pharmacy and of the University as a whole.

At the end of the program students will:

1. Apply basic biopharmaceutical principles involved in absorption, distribution, metabolism and excretion and use appropriate mathematical models to describe them.
  - 1.1 Given drug concentration/time profile data the students should be able to:
    - 1.1.1 Calculate the following pharmacokinetic parameters: half-life, clearance, volume of

- distribution;
    - 1.1.2 Determine the type of distribution (instantaneous versus slow);
    - 1.1.3 Identify types of elimination (first-order or non-linear);
    - 1.1.4 Identify types of absorption;
  - 1.2 Discuss the effect on the volume of distribution of binding to plasma proteins or to peripheral tissue components;
  - 1.3 Identify dose and time dependencies in plasma concentration profiles;
  - 1.4 Assess primary route of elimination: renal excretion or hepatic metabolism;
  - 1.5 Calculate bioavailability and bioequivalence in accordance with FDA requirements;
  - 1.6 Describe a pharmacokinetic/pharmacodynamics (PK/PD) system;
  - 1.7 Describe and discuss different PK/PD models;
  - 1.8 Possess basic knowledge of the physiological processes affecting drug absorption, distribution, metabolism, and excretion;
  - 1.9 Possess a basic understanding of IVIVC models;
  - 1.10 Understand the relevance of bio-analytical method validation for the correct measurement of plasma concentrations used to calculate pharmacokinetic parameters.
2. Demonstrate the ability to develop, validate and apply different instrumental analytical techniques toward the analysis of drug products in various dosage forms.
    - 2.1 Describe how to validate analytical method;
    - 2.2 Be able to select appropriate column for HPLC analysis;
    - 2.3 Perform calculations necessary, to determine the concentration of an analyte in given sample;
    - 2.4 Select the appropriate method for quantitative measurement of analyte concentration.
  3. Use physical chemical principles involved in development of dosage form.
    - 3.1 Describe physical mechanisms governing how a particular dosage form works;
    - 3.2 Interpret in vitro dissolution profiles from a dosage form;
    - 3.3 Describe physical and chemical properties of solvents and solutes and relate them to solubility and/or dissolution of drugs;
    - 3.4 Design experiments and interpret data to evaluate chemical stability of dosage forms;
    - 3.5 Describe polymorphisms and how to evaluate their effects on physical stability of solid dosage forms;
    - 3.6 Describe the physicochemical mechanisms of solubility enhancement in solid dosage forms, and how they relate to formulation and dissolution evaluation;
    - 3.7 Describe and evaluate factors differentiating in vitro dissolution with in vivo performance of dosage forms.
  4. Develop the expertise and skills necessary for the design, manufacture and evaluation of various dosage forms and other drug delivery systems.
    - 4.1 Perform calculations necessary to scale-up a

- dosage form;
- 4.2 List the challenges involved in preparing an appropriate dosage form;
- 4.3 Calculate particle size using appropriate models;
- 4.4 Describe criteria required for selecting appropriate dosage form;

#### Cosmetic Science

The mission of the Master of Science in Pharmaceutics with specialization in Cosmetic Science is to uniquely prepare students for entry into the cosmetics industry and other related fields. Graduates of the program will be highly sought after by the global cosmetics industry to support research, development and manufacturing operations in the areas of chemistry, cosmetic/dermatological formulations technology, product evaluations and safety. Alumni should become positioned to assume leadership positions within the cosmetics industry.

At the end of the program students will:

1. Develop the expertise and skills necessary for the design, manufacture and evaluation of various cosmetic and dermatological products.
  - 1.1 Perform calculations necessary to scale-up a dermatological formulation;
  - 1.2 List the challenges involved in formulation and preparation of dermatological products;
  - 1.3 Design set of experiments necessary to develop a dermatological product;
  - 1.4 Evaluate final dermatological product based on in-vitro experiments;
  - 1.5 Identify tests necessary to conduct in-vitro testing of dermatological products.
2. Demonstrate ability to develop, validate and apply different instrumental analytical techniques to analyze various cosmetic and dermatological products.
  - 2.1 Describe how to validate analytical methods;
  - 2.2 Be able to select appropriate column for HPLC analysis;
  - 2.3 Perform calculations necessary to determine the concentration of an analyte in given sample;
  - 2.4 Select the appropriate method for quantitative measurement of analyte concentration.
3. Use physical chemical principles involved in development of dermatological dosage forms.
  - 3.1 Identify appropriate ingredients to formulate a cosmetic dosage form;
  - 3.2 Demonstrate the ability to conduct stability testing of different dermatological formulations;
  - 3.3 Apply physiochemical principles to develop dermatological products;
  - 3.4 Utilize rheological parameters for packaging of dermatological formulations;
  - 3.5 Understand principles underlying behavior of various types of surfactants;
  - 3.6 Understand properties of preservatives and their application.
4. Develop the oral and written communication skills necessary to inform and educate professional and scientific peers.

- 4.1 Demonstrate the ability to write scientific documents;
- 4.2 Demonstrate ability to present scientific findings orally.

#### Requirements for the Specialization in Industrial Pharmacy:

Students taking the Non-Thesis Option must complete 36 credits of course work and pass the written comprehensive examination. Students starting prior to Fall 2014 taking the Thesis Option must complete 33 credits of course work of which 6 credits are for PHS 060 Research and Thesis, submit a satisfactory thesis proposal, submit a satisfactory written thesis, and successfully defend (orally) their written thesis. Students starting Fall 2014 and after taking the Thesis Option must complete 36 credits of course work of which 6 credits are for PHS 060 Research and Thesis, pass the written comprehensive examination, submit a satisfactory thesis proposal, submit a satisfactory written thesis, and successfully defend (orally) their written thesis.

#### The following courses are required for the Specialization in Industrial Pharmacy for students starting the program prior to Fall 2014:

PHS	020	Seminar in Pharmaceutics	3.00
PHS	701	Physical Chemistry I	3.00
PHS	901	Basic Pharmaceutics (Required for foreign students and non-pharmacy majors)	3.00
PHS	931	Advanced Physical Pharmacy I	3.00
PHS	934	Industrial Pharmacy I	3.00
PHS	935	Industrial Pharmacy II	3.00
PHS	972	Methods of Pharmaceutical Analysis	3.00
PHS	985	Biopharmaceutics/Pharmacokinetics	3.00

#### The following courses are required for the Specialization in Industrial Pharmacy for students starting the program Fall 2014 and after:

PHS	020	Pharmaceutical Regulatory Overview	3.00
PHS	931	Advanced Physical Pharmacy I	3.00
PHS	932	Advanced Physical Pharmacy II	3.00
PHS	934	Principles of Industrial Pharmacy I	3.00
PHS	935	Principles of Industrial Pharmacy II	3.00
MAT	610	Differential Equations I	3.00
PHS	972	Methods of Pharmaceutical Analysis	3.00

PHS	987	Advanced Biopharmaceutics/Pharmacokinetics	3.00
PHA	010	Biostatistics	3.00
<b>Students selecting the Thesis Option must register for the following course in two consecutive semesters:</b>			
PHS	060	Research And Thesis	3.00

#### The following courses may be selected from as electives for the Specialization in Industrial Pharmacy:

PHA	010	Biostatistics (Required Fall 2014 and after)	3.00
PHS	070	Special Projects	3.00
PHS	702	Physical Chemistry II	3.00
PHS	769	Transdermal Drug Delivery	3.00
PHS	932	Advanced Physical Pharmacy II (Required Fall 2014 and after)	3.00
PHS	936	Dosage Form Design	3.00
PHS	937	Pharmaceutical Engineering	3.00
PHS	950	Dermatological Formulations Technology I	3.00
PHS	951	Dermatological Formulations Technology II	3.00
PHS	958	Aerosol Science and Technology	3.00
PHS	960	Properties/Applications of Cosmetic and Pharmaceutical Raw Materials	3.00

#### Requirements for the Specialization in Cosmetic Science:

Students taking the Non-Thesis Option must complete 33 credits of course work and pass the written comprehensive examination. Students taking the Thesis Option must complete 30 credits of course work of which 6 credits are for PHS 060 Research and Thesis, submit a satisfactory thesis proposal, submit a satisfactory written thesis, and successfully defend (orally) their written thesis.

#### The following courses are required for the Specialization in Cosmetic Science:

PHA	010	Biostatistics	3.00
PHS	020	Seminar In Pharmaceutics	3.00
PHS	931	Advanced Physical Pharmacy I	3.00
PHS	950	Cosmetic/Dermatological Formulations and Technology I	3.00
PHS	951	Cosmetic/Dermatological Formulations and Technology II	3.00

PHS 952	Cosmetic/Dermatological Formulations and Technology Laboratory	3.00
PHS 960	Properties/Applications of Cosmetic and Pharmaceutical Raw Materials	3.00
PHS 972	Methods of Pharmaceutical Analysis	3.00

**Students selecting the Thesis Option must register for the following course in two consecutive semesters:**

PHS 060	Research And Thesis	3.00
PHS 060	Research And Thesis	3.00

**The following courses may be selected from as electives for the Specialization in Cosmetic Science:**

PHS 070	Special Projects	3.00
PHS 702	Physical Chemistry II	3.00
PHS 769	Transdermal Drug Delivery	3.00
PHS 932	Advanced Physical Pharmacy II	3.00
PHS 936	Dosage Form Design	3.00
PHS 937	Pharmaceutical Engineering	3.00
PHS 958	Aerosol Science and Technology	3.00

## Master of Science Degree in Pharmacology / Toxicology

*Program Director*

**Kenza E. Benzeroual, Ph.D.**

Telephone: 718-488-1101

LIU Pharmacy's M.S. in Pharmacology and Toxicology degree program prepares student lifelong learners with the knowledge and abilities required for competitive technical positions in pharmacological research and testing, for participating in clinical trials, and for performing toxicological reviews and assessments in the pharmaceutical and biotechnology industries as well as in academic and governmental research laboratories. Additionally, graduates are well-positioned to continue their studies in Ph.D. programs in pharmacology and other biomedical sciences, while other graduates may find the program ideal for improving their credentials toward gaining admission to medical school or other health professional programs.

Students will: a) demonstrate a mastery of a broad didactic foundation in pharmacology and toxicology; b) develop research skills through exposure to significant research opportunities and experiences during which they translate their knowledge base into practice; and c) utilize professional skills such as statistical analysis,

written and verbal communication. These abilities will be acquired through specific coursework, labs, seminars, and other professional and personal development offered during the course of study.

### Program Goals

1. Apply the knowledge of mechanisms of action of drugs and toxicants to discuss the clinical profile of pharmacological agents.
  - 1.1 Discuss the mechanisms of action of selected drugs/toxicants at the molecular, cellular, organ system, and whole body level;
  - 1.2 Discuss the toxicity of drugs based on the physiology and the pathophysiology of the disease;
  - 1.3 Assess and evaluate therapeutic and/or toxic outcomes based on the knowledge of drugs/toxicants accessibility to target sites.
2. Apply the knowledge of pharmacokinetic and pharmacodynamic processes and principles to discuss therapeutic and toxic outcomes of pharmacological agents.
  - 2.1 Apply the pharmacokinetic processes to discuss the absorption, distribution, metabolism, and excretion of drugs/toxicants;
  - 2.2 Apply the pharmacodynamic principles to discuss a drug's affinity, potency, and efficacy;
  - 2.3 Evaluate the impact of pharmacokinetic processes on the action of drugs/toxicants and their clinical/toxic outcomes;
  - 2.4 Use the pharmacodynamic principles to discuss the mechanism of action of drugs/toxicants and clinical/toxic outcomes;
  - 2.5 Use appropriate concepts, principles, and analysis skills to address drug efficacy/toxicity queries;
  - 2.6 Discuss the clinical uses and the safety profile of various classes of drugs;
  - 2.7 Solicit appropriate information required to address drug efficacy/toxicity queries.
3. Develop oral and written communication skills necessary to disseminate scientific information.
  - 3.1 Orally communicate sound evaluations of discipline-specific, peer-reviewed papers;
  - 3.2 Demonstrate verbal communication skills during seminar presentations and thesis defense;
  - 3.3 Demonstrate the ability to write scientific reports and evaluations in the area of study;
  - 3.4 Develop proficiency in writing abstracts;
  - 3.5 Demonstrate the ability to write a research project;
  - 3.6 Write a thesis dissertation based on data obtained during laboratory training and investigation.
4. Retrieve, analyze, interpret, and critique scientific literature in pharmacology and toxicology.
  - 4.1 Conduct a literature review independently using appropriate keywords, databases, and select pharmacology and toxicology peer-reviewed papers that pertain to a specific problem;
  - 4.2. Analyze, interpret, and critique the scientific literature with regard to study design, data interpretation, and appropriateness of conclusions.
5. Develop the skills needed to perform analytical and experimental techniques, and research

methodology.

- 5.1 Develop an experimental technique based on one's own research area;
- 5.2 Design experiments using pharmacological and toxicological tools to investigate a specific research area;
- 5.3 Develop and validate research methodologies to investigate specific research questions.
6. Identify research opportunities, develop hypotheses and design research projects, and execute independent research. (Thesis option students).
  - 6.1 Demonstrate the ability to carry out experiments in a laboratory setting;
  - 6.2 Demonstrate the ability to design experimental protocols;
  - 6.3 Statistically analyze and generate graphics of the data and interpret experimental findings;
  - 6.4 Demonstrate the ability to conduct a literature search for a specific area of investigation;
  - 6.5 Identify areas of unsolved investigation; develop hypotheses and research questions.

*Undergraduate Prerequisites:*

**Biochemistry, Physiology and Pharmacology**

### Master of Science in Pharmacology/Toxicology Requirements

Students taking the Non-Thesis Option must complete 36 credits of course work and pass the written comprehensive examination. Students taking the Thesis Option must complete 33 credits of course work of which 6 credits are in PTM 060 Research and Thesis, submit a satisfactory thesis proposal, submit a satisfactory written thesis, and successfully defend (orally) their written thesis.

### The following courses are required for the Master of Science in Pharmacology/Toxicology

PHA 010	Biostatistics	3.00
PTM 020	Seminar In Pharmacology/Toxicology	3.00
PTM 704	Autonomic Pharmacology	3.00
PTM 705	Biochemical Pharmacology	3.00
PTM 709	Advanced Pharmacology	3.00
PTM 802	Experimental Methods in Pharmacology and Toxicology	3.00
PTM 910	Toxicology of Drugs and Chemicals	3.00

### The following courses may be selected from as electives for the Master of Science in Pharmacology/Toxicology:

(\*Thesis Option students must take six (6) credits of PTM 060 Research and Thesis)

PTM 060	Research and Thesis	3.00
PTM 070	Special Projects	3.00
PTM 708	Cardiovascular Pharmacology	3.00

PTM	711	Current Technologies in Pharmaceutical Research and Development	3.00
PTM	804	Inborn Errors of Metabolism	3.00
PTM	905	Principles of Immunotherapy	3.00
PTM	907	Psychopharmacology	3.00
PTM	917	Molecular Toxicology	3.00
PTM	920	Molecular Pharmacology	3.00
PTM	925	Pharmacogenomics	3.00
PTM	938	Stem Cells and Regenerative Medicine	3.00

## Master of Science Degree in Drug Regulatory Affairs

### Program Director

David R. Taft, Ph.D.

Telephone: 718-488-1101

### Program Mission

The mission of the Master of Science program in Drug Regulatory Affairs is to prepare students to become lifelong learners and leaders in a variety of settings including biotechnology, medical devices, pharmaceuticals, consulting arena, and liaise with government and regulatory agencies worldwide. Students will: a) demonstrate a mastery of a broad didactic foundation in regulatory affairs gained in advanced coursework; b) develop strong skills through exposure to significant regulatory projects and case studies during which they translate their knowledge into practice; and c) utilize professional skills such as statistical analysis, knowledge of regulatory guidance documents, as well as written and verbal communication skills.

These abilities will be acquired through specific coursework and seminars and other professional and personal development offered during the course of study.

### Program Goals

1. Demonstrate an understanding of the role of a medical products regulatory affairs specialist and the dynamic nature of the regulatory field.
  - 1.1 Evaluate real and/or simulated regulatory submissions for appropriateness of the submission to the regulatory requirements of product design, manufacturing, testing and post-market surveillance strategies;
  - 1.2 Examine real or simulated regulatory submissions to judge adherence to prescribed guidance documents and principles of responsible clinical research;
  - 1.3 Identify the differences between patents, trademarks, and trade secrets as they relate to regulatory and marketing strategy.
2. Identify and utilize the laws and regulations that apply to the development, testing, and production of new medical products, including medical

- devices, In-Vitro Diagnostics (IVDs, pharmaceuticals, biotechnology-derived therapeutics, and biologics.
- 2.1 Assess current US Food and Drug Administration (FDA) regulations that focus on drugs and medical devices and their impact on regulatory submissions such as New Drug Applications (NDA), Abbreviated NDAs, Investigational New Drug (IND) Applications, 510k, and Pre-Market Authorizations PMAs;
  - 2.2 Delineate specific regulations in the Code of Federal Regulations (CFR) that address patient safety and their impact on product development.
  3. Identify a specific regulatory issue for either a drug or device and be able to justify an appropriate position or strategy through presentation and written skills.
    - 3.1 Strategically build various sections of a 510k submission for a Class II medical device given baseline data;
    - 3.2 Demonstrate the ability to investigate case studies related to various regulatory topics (e.g. regulatory submissions, product defect, clinical trials and quality assurance strategies). This should include; identification of the issue, research of the topic, and development of a report summarizing the findings;
    - 3.3 Demonstrate the ability to construct a Power Point presentation on a topic related to a current regulatory issue. This presentation should have relevant content and appropriate information that addresses the selected topic adequately;
    - 3.4 Demonstrate the ability to construct a Power Point presentation on a topic related to a current regulatory issue and communicate the findings effectively to an audience.
  4. Demonstrate the ability to develop personal and professional skills in the field of regulatory affairs.

### Master of Science with Specialization in Drug Regulatory Affairs

Students taking the Non-Thesis Option must complete 33 credits of course work and pass the written comprehensive examination. Students taking the Thesis Option must complete 33 credits of course work of which 3 credits are in PHA 050 Research Methodology, 6 credits are in PHA 060 Research and Thesis, submit a satisfactory thesis proposal, submit a satisfactory written thesis, and successfully defend (orally) their written thesis.

### The following courses are required for the Specialization in Drug Regulatory Affairs:

PHA	010	Biostatistics	3.00
PHA	603	Drug Regulatory Affairs	3.00
PHA	651	Pharmaceutical Labeling, Advertising and Promotion	3.00
PHA	653	Seminar in Social and Administrative Sciences	3.00
PHA	654	FDA Regulation of Over-the-Counter Drugs, Medical Devices and Dietary Supplements	3.00

PHA	657	Principles and Practices of Regulatory Compliance and Enforcement	3.00
PHA	660	Mechanics of Preparing INDs and NDAs	3.00
PHA	661	The American Pharmaceutical Industry	3.00

### The following courses may be selected from as electives for the Specialization in Drug Regulatory Affairs:

#### Regulatory Affairs:

(\*Thesis Option students must take PHA 050 and six (6) units of PHA 060.)

PHA	050	Research Methodology	3.00
PHA	060	Research And Thesis	3.00
PHA	601	Marketing Research and Analysis	3.00
PHA	604	Pharmacoeconomics	3.00
PHA	607	Behavioral Pharmacy	3.00
PHA	613	Marketing Management	3.00
PHA	614	Health Literacy	3.00
PHA	617	Pharmaceutical Laws and Enforcement	3.00
PHA	618	Patent Law and the Pharmaceutical Industry	3.00
PHA	645	Internship in Drug Regulatory Affairs	3.00
PHA	655	Chemistry, Manufacturing and Controls (CMC) Regulatory Affairs	3.00
PHA	656	Current Enactments, Regulations and Guidances	3.00
PHA	658	International Drug Regulatory Affairs	3.00
PHA	662	Ethics in the Pharmaceutical Industry	3.00
PHA	663	Food and Drug Law	3.00
PHA	665	Healthcare Data Management and Analysis	3.00

## GRADUATE COURSE DESCRIPTIONS

Course schedules are printed every semester. The listings below are tentative. They are based on past history and are subject to change.

### Doctor of Philosophy Courses

#### PHS 021 Seminar In Pharmaceutics

(For Ph.D. Students) A presentation and analysis of recent publications and developments in pharmaceutics. The students are expected to make presentations and/or write reports on specific topics. Outstanding scientists may be involved from time to time. This course is open for the Ph.D. level student. M.S. candidates may be allowed with permission of the Program Director. Ph.D. candidates must register for three consecutive semesters and must attend and participate throughout their studies. Pass-Fail only.

*Credits: 1*

*Every Semester*

#### PHS 602 Pharmaceutical Regulatory Overview

This course will provide a clear understanding of how new chemical entities (NME) emerge from drug discovery. When and how absorption, distribution, metabolism, and excretion (ADME) studies in discovery and exploratory development stages of drugs are conducted to assess the metabolism and excretion of a drug in animals and human. Outline the physicochemical characterization and compatibility of new molecule. First-in-human (FIH) studies in the drug development process and typically aim to characterize a compound's pharmacokinetics, potential effective concentration or dose, and safety or tolerability margins. A look at different phases of clinical trials for an understanding of the different purpose and questions these are trying to answer. Overview of submission requirements and the Food and Drug Administration's (FDA) review process. Intellectual property (IP) protection and market exclusivities to reward innovation, related legislation and ongoing issues will be discussed. Development and approval of generic versions of the new drugs and their impact on the industry will be reviewed.

*Credits: 3*

*Annually*

#### PHS 880 Thermal Physics and Applications to the Chemistry of Pharmaceutical Systems I

The first in a series of two elective courses intended for Ph.D. students. These courses offer an integrated treatment of the theory of energetic processes and applications that are relevant to pharmaceutical science. The first semester will develop equilibrium macroscopic and statistical thermodynamics, and introduce the concepts on nonequilibrium thermodynamics. The Second

semester will more fully develop the basic theory of nonequilibrium thermodynamics and the thermodynamics of processes. Applications will be introduced throughout the course and include colligative properties of solutions, Debye-Huckel theory, phase changes and thermodynamic stability, chemical equilibrium and reactions, surface effects, adsorption, polymer chain statistics, Flory-Huggins theory, and thermal analysis.

*The pre-requisites of PHS 701, 702 and 991 are required.*

*Credits: 3*

*Every Fall*

#### PHS 881 Thermal Physics and Applications to the Chemistry of Pharmaceutical Systems II

(The second course in a two-semester sequence.)

These are elective courses intended for Ph.D. students. They offer an integrated treatment of the theory of energetic processes and applications that are relevant to pharmaceutical science. The first semester will develop equilibrium macroscopic and statistical thermodynamics, and introduce the concepts on nonequilibrium thermodynamics. The Second semester will more fully develop the basic theory of nonequilibrium thermodynamics and the thermodynamics of processes. Applications will be introduced throughout the course and include colligative properties of solutions, Debye-Huckel theory, phase changes and thermodynamic stability, chemical equilibrium and reactions, surface effects, adsorption, polymer chain statistics, Flory-Huggins theory, and thermal analysis.

*The pre-requisite of PHS 880 and 992 are required.*

*Credits: 3*

*Every Spring*

#### PHS 886 Computational Methods of Data Analysis

This is an elective course intended for Ph.D. students. The course offers an integrated treatment of the methods of analyzing data using the equations derived from physical models. Topics include elementary statistics review, regression methods, analysis of errors, and computational methods. Special consideration will be given to methods of transforming equations and/or data into forms most useful for data analysis, special functions (error function, Bessel functions, etc.), and special problems that can arise with various methodologies. Many of the examples and exercises will be taken from probability theory and statistics, so this course will also serve as a primer in statistics.

*The pre-requisites of PHS 701 and 993 are required.*

*Credits: 3*

*Every Semester*

#### PHS 887 Pharmacokinetic / Pharmacodynamic Modeling and Simulation

There is a growing need for scientists trained in pharmacokinetic modeling and simulation. This is an elective course for students in the Ph.D. program in Pharmaceutics. The objectives of the

course are: To provide an overview of the role of pharmacokinetic/pharmacodynamic (PK/PD) modeling and simulation in the drug development process, to give a graduate level introduction to the field of Pharmacometrics and to demonstrate the applications of Population PK/PD modeling and simulation using examples of biomarkers and clinical endpoints in various therapeutic areas such as CNS, cardiovascular, and infectious diseases. The course will balance theory and "hands on" training and will be a combination of didactic lectures, hands on exercises and larger M&S projects conducted by the students.

*The pre-requisite of PHS 987 and 990 are required.*

*Credits: 3*

*On Occasion*

#### PHS 901 Basic Pharmaceutics

(Open to foreign students and non-pharmacy majors) An introduction to basic pharmaceutical principles associated with pharmaceutical dosage forms. Discussions will focus on factors affecting dosage form design, manufacturing of different dosage forms, biopharmaceutics, pharmacokinetics, drug stability, FDA approvals and recalls, so that the student can obtain the knowledge needed to succeed in the M.S. and Ph.D. curricula. Waiver may be authorized by the division only.

*Credits: 3*

*Every Fall*

#### PHS 983 Polymer Science

Polymers are widely used in the pharmaceutical, finding applications as tablet excipients, membranes, and carriers for drugs. The properties of polymers are of great importance in drug delivery in many forms, including solid, melt and in solutions. In this course, the physical chemistry and material properties of polymers are studied, with emphasis on pharmaceutical applications and current areas of intense research.

*Credits: 3*

*Annually*

#### PHS 987 Advanced Biopharmaceutics and Pharmacokinetics

Biopharmaceutics is the study of the relationship between the physical and chemical factors of a drug in a dosage form and the resultant impact on the rate and extent of drug absorption and, ultimately, the pharmacological response observed after its administration. Pharmacokinetics concerns the mathematical representation of drug absorption, distribution, metabolism and excretion. In this course, the principles and theories of biopharmaceutics and pharmacokinetics will be discussed, with emphasis on the various analytical tools to characterize drug disposition in vivo. The relationship between pharmacokinetics and pharmacodynamics will also be presented. The material mastered in this course will be used to develop and test mathematical models of drug disposition in PHS 990 (Mathematical Modeling).

*Credits: 3*

*On Occasion*

#### **PHS 989 Special Topics in Pharmaceutics**

Special topics in pharmaceutics which are of current interest.

*Credits: 3*

*On Occasion*

#### **PHS 990 Mathematical Modeling**

This course involves application of the pharmacokinetic principles presented in PHS 986 (Advanced Biopharmaceutics and Pharmacokinetics) to develop mathematical models which describe drug absorption, distribution, metabolism and excretion, with emphasis upon computer "fitting" of pharmacokinetic and pharmacokinetic-pharmacodynamic models to characterize the disposition of a compound in biological systems.

*The pre-requisite of PHS 987 is required.*

*Credits: 3*

*On Occasion*

#### **PHS 991 Solubility and Complex Equilibria**

The application of physicochemical principles to the study of complex equilibria, including the use of thermodynamics and mathematics to delineate the factors involved.

*Credits: 3*

*On Occasion*

#### **PHS 992 Transport Phenomena and Drug Delivery I**

The application of the laws and mathematics of diffusion to dissolution, membrane transport and release of drugs from dosage forms.

*The pre-requisites of PHS 701 and MTH 611 are required.*

*Credits: 3*

*On Occasion*

#### **PHS 993 Kinetics and Mechanisms of Drug Degradation**

A study of the kinetics and mechanisms of drug degradation in the solid and liquid state.

*The pre-requisite of PHS 701 is required. The co-requisite of MTH 610 is required.*

*Credits: 3*

*On Occasion*

#### **PHS 994 Drug Stabilization**

A study of drug degradation in multiphasic systems of their use in stabilizing labile drugs.

*The pre-requisite of PHS 993 is required.*

*Credits: 3*

*On Occasion*

#### **PHS 995 Transport Phenomena and Drug Delivery II**

This is an upper-level elective course intended for senior Ph.D. students which builds on the required course PHS 992 (Transport Phenomena and Drug Delivery I). The course offers a more advanced treatment of the physical and theoretical foundations of transport theory, and numerous

applications in areas of current research, especially as related to pharmaceutical systems. The main emphasis is on mass transport, but heat and momentum transport will also be included. The necessary mathematics will be developed, as needed. Methods of data analysis and computational methods will be included as an integral part of the course.

*The pre-requisite of PHS 992 is required.*

*Credits: 3*

*On Occasion*

#### **PHS 996 Interfacial Phenomena**

The application of physicochemical principles to the study of interfacial phenomena. The use of thermodynamics, kinetics and mathematics will be emphasized with applications to pharmaceutical systems, when possible.

*Credits: 3*

*On Occasion*

#### **PHS 997 Solid State Characterization**

Substantial development has taken place in the last decade in terms of emerging technology in the field of analytical chemistry. As a graduate student it is important to keep abreast of these technologies and understand the underlying principles behind the techniques and technologies. This course will help students develop the ability to solve theoretical problems and help them identify relevant techniques to obtain meaningful data. Together with case studies and examples, this course will help graduate students to think independently to solve problems related to solid-state characterization.

*Credits: 3*

*Annually*

#### **PHS 998 Ph.D. Research & Thesis**

Each Ph.D. candidate will conduct Ph.D. thesis research under the guidance of a committee whose chair will be the candidate's major professor. The enrollment and fee for this course registration will be repeated for a minimum of four semesters, and until the dissertation is completed.

*Credits: 3*

*Every Semester*

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## **Master of Science Courses**

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### **Pharmaceutics, Industrial Pharmacy, and Cosmetic Science**

#### **PHS 020 Seminar In Pharmaceutics**

(For M.S. Students) A presentation and analysis of recent developments in industrial pharmacy and pharmaceutics. Students are expected to present oral and written reports on a particular subject in consultation with the instructor in charge. May be repeated for credit.

*Credits: 3*

*Every Semester*

#### **PHS 060 Research And Thesis**

(For M.S. Students) Individual research in the various areas of specialization. Students doing the thesis option must register at least twice for this course. Pass-Fail only.

*Credits: 3*

*Every Semester*

#### **PHS 070 Special Problems**

Laboratory, fieldwork or library research in the various areas of specialization. Pass-Fail only. Permission of the instructor required.

*Credits: 3*

*Every Semester*

#### **PHS 701 Physical Chemistry I**

The emphasis will be on chemical thermodynamics, from fundamental principles to applications in chemical equilibrium, including the concept of activity in nonideal systems, and electrochemistry of the pH electrode and other ion selective electrodes.

*Credits: 3*

*Every Fall*

#### **PHS 702 Physical Chemistry II**

The emphasis of this course is on chemical kinetics, from experimental measurement of rate processes to activation theory and enzyme kinetics. Steady state activation theory will be included.

*The pre-requisite of PHS 701 is required.*

*Credits: 3*

*Every Spring*

#### **PHS 769 Transdermal Drug Delivery**

Today's pharmaceutical scientist, regardless of their area of practice (R & D, manufacturing, etc.) must have a basic knowledge of drug delivery from all dosage forms. Therefore, this course is intended to train the pharmaceutical scientist in preparing a transdermal dosage form capable of delivering the active ingredient to the blood circulation through the skin in quantities sufficient to produce a therapeutic effect. Two lecture hours and three laboratory hours.

*Credits: 3*

*On Occasion*

#### **PHS 931 Advanced Physical Pharmacy I**

A systematic study of the application of physicochemical principles to the pharmaceutical and cosmetic sciences. Topics include complexation, colloids, interfacial phenomena, dissolution theory, suspensions, micrometrics and rheology.

*The pre-requisite of PHS 701 is required.*

*Credits: 3*

*Every Semester*

#### **PHS 932 Advanced Physical Pharmacy II**

A systematic study of the application of physicochemical principles to the pharmaceutical and cosmetic sciences. Topics include complexation, colloids, interfacial phenomena, dissolution theory, suspensions, micrometrics and rheology.

*The pre-requisite of PHS 931 is required.*

*Credits: 3*

Every Semester

**PHS 934 Principles of Industrial Pharmacy I**

A study of methods used to formulate, manufacture and stability-test various dosage forms including tablets, ointments, creams, capsules, suspensions, sterile products, etc. The different techniques used to formulate dosage forms possessing unique properties such as sustained or delayed release will also be covered.

*Credits: 3*

*Every Fall*

**PHS 935 Principles of Industrial Pharmacy II**

A laboratory course designed to give students experience in utilizing industrial instrumentation to test basic principles and theories in the design and production of various dosage forms.

*The pre-requisite of PHS 934 is required.*

*Credits: 3*

*Every Spring*

**PHS 936 Dosage Form Design**

Biopharmaceutic and pharmacokinetic principles, coupled with physical pharmacy concepts, are used to discuss methods necessary for optimizing the design of various drug-delivery systems. The course is intended for those having a basic understanding of dosage forms and their design, and is geared to the underlying principles of drug release from dosage forms. While a major portion of the course is devoted to oral solids, liquids, topicals and parenteral design are also covered, together with means of evaluation and testing.

*Credits: 3*

*On Occasion*

**PHS 937 Pharmaceutical Engineering**

An introduction to basic engineering principles that are involved in the commercial manufacture of pharmaceutical dosage forms. Discussions will focus on how such principles are blending, mixing, heat and mass transfer are utilized to design and specific equipment used in producing powders, tablets, capsules and parenteral products. Basic concepts of cost estimation will also be discussed.

*Credits: 3*

*On Occasion*

**PHS 950 Cosmetic/Dermatological Formulations and Technology I**

(The first course in a two-semester sequence.) Designed for in-depth studies of skin, mechanistic analysis of the relevant skin functions, percutaneous absorption, rationale for dermatologic formulations, physicochemical principles used, performance criteria and evaluation of the topical systems. Emphasis is placed on the product development, scale-ups, manufacturing, stability-testing and performance evaluations of modern-day cosmetic, toiletry and pharmaceutical topical products. The courses cover all types of skin care, hair care and treatment systems including creams, lotions, shampoos, gels, fluids, makeups, sunscreens and pharmaceutical dermatologicals.

*Credits: 3*

*Every Fall*

**PHS 951 Cosmetic/Dermatological Formulations and Technology II**

(The second course of a two-semester sequence.) Designed for in-depth studies of skin, mechanistic analysis of the relevant skin functions, percutaneous absorption, rationale for dermatologic formulations, physicochemical principles used, performance criteria and evaluation of the topical systems. Emphasis is placed on the product development, scale-ups, manufacturing, stability-testing and performance evaluations of modern-day cosmetic, toiletry and pharmaceutical topical products. The courses cover all types of skin care, hair care and treatment systems including creams, lotions, shampoos, gels, fluids, makeups, sunscreens and pharmaceutical dermatologicals.

*The pre-requisite of PHS 950 is required.*

*Credits: 3*

*Every Spring*

**PHS 952 Cosmetic/Dermatological Formulations and Technology Laboratory**

Designed for in-depth study of product development, scale-up, manufacturing, stability-testing and performance evaluations of modern-day cosmetic and toiletry products.

*Credits: 3*

*On Occasion*

**PHS 958 Aerosol Science and Technology**

An in-depth study of the physicochemical principles of aerosol science and technology. The topics covered include: aerosol propellants, containers, valve and actuator systems, product development, manufacturing, stability testing and performance evaluations of all types of aerosol products. Special emphasis is placed on the homogeneous and heterogeneous systems used in the formulations of topical, nasal and inhalation aerosol drug delivery products.

*Credits: 3*

*On Occasion*

**PHS 960 Properties/Applications of Cosmetic and Pharmaceutical Raw Materials**

Designed to be of special value to individuals involved in formulation and manufacturing work of cosmetic, toiletry and pharmaceutical products. Covers the physicochemical properties of major classes of raw materials. These include tablets, ointments and creams, surfactants, film formers, plasticizers, preservatives, antioxidants, sunscreens, thickeners and dispersants, pharmaceutical solvents, etc. Special emphasis is placed on the creative and innovative application of these raw materials in the development of contemporary cosmetic/toiletry and pharmaceutical dosage forms.

*Credits: 3*

*Every Fall*

**PHS 972 Methods of Pharmaceutical Analysis**

Theory of chromatographic, spectrophotometric and other methods of analysis as applied to clinical, pharmaceutical and cosmetic problems is discussed.

*Credits: 3*

*Every Spring*

**PHS 979 Design of Peptide and Protein Drug Delivery Systems**

The course covers an introduction to the gene-cloning technology and ex-vivo cell cultures as a new source of protein and peptide drugs. The course will discuss the chemistry, physical chemistry and biochemical properties of polypeptides; physical and chemical degradation pathways characteristic to protein drugs; suggested mechanisms of protein drug absorption; classification and properties of absorption promoters for macromolecules; how to design the appropriate delivery system for a stable, effective protein drug through parenteral or non-parenteral routes. Specific protein products for the diagnosis, treatment and prevention of diseases, which are now commercially available, will be covered.

*Credits: 3*

*On Occasion*

**PHS 982 Science and Technology of Controlled Release Systems**

This course will cover design and fabrication of currently utilized devices for controlling the release of drugs to the human body. A wide variety of drug delivery system designs will be analyzed in this course. Mechanisms and kinetics of drug release from these systems, structure and properties of fabrication materials, principles of molecular diffusion across polymer barriers and transport across biological interfaces will be covered. This course is a senior elective for both M.S. and Ph.D. students.

*Credits: 3*

*On Occasion*

**Pharmacology, Toxicology and Medicinal Chemistry**

**PTM 020 Seminar In Pharmacology/Toxicology**

Students, faculty and guests review and discuss original works and recent advances in pharmacology and toxicology. The seminar will include invited lectures on cutting edge research. Mandatory for every student graduating in Pharmacology/Toxicology. May be repeated for credit.

*Credits: 3*

*Every Semester*

**PTM 060 Research And Thesis**

Individual research in the various areas of specialization. Students doing the thesis option

must register at least twice for this course. Pass-Fail only.

*Credits: 3*  
*Every Semester*

#### **PTM 070 Special Problems**

Laboratory, fieldwork or library research in the various areas of specialization. Pass-Fail only. Permission of the instructor required.

*Credits: 3*  
*Every Semester*

#### **PTM 704 Autonomic Pharmacology**

A course designed to acquaint the students with the historical development of the concept of neurohumoral transmission, adrenergic and cholinergic receptors, storage and release of neurohormones, blocking agents, and biochemical aspects of adrenergic and cholinergic action. Students will be required to read and discuss selected references.

*Credits: 3*  
*Every Fall*

#### **PTM 705 Biochemical Pharmacology**

This course considers the mechanisms of drug action from the molecular-biochemical viewpoint. Initial discussion of the fundamentals of drug action is followed by extensive coverage of major drug groups such as anticancer, antimicrobials, analgesics and autonomic drugs. Molecular parameters of receptors are emphasized throughout as in enzymology, where applicable. Outside readings will be assigned.

*Credits: 3*  
*Every Fall and Spring*

#### **PTM 707 Carcinogens, Mutagens, Teratogens**

Basic concepts of biochemical toxogenesis; mechanisms involved in the types of carcinogenesis, mutagenesis and teratogenesis; chemical carcinogens; tests for carcinogenesis and mutagenesis; experimental aspects of teratogenesis; environmental agents, drugs and other agents as causative factors.

*Credits: 3*  
*On Occasion*

#### **PTM 708 Cardiovascular Pharmacology**

This course will consider the rational therapy in cardiovascular diseases. Principles of physiology, pathology and pharmacology will be included in the discussion of hypertension, coronary artery disease, angina pectoris, myocardial infarction, congestive heart failure and arrhythmias. New treatment modalities will be considered.

*Credits: 3*  
*On Occasion*

#### **PTM 709 Advanced Pharmacology**

This is an advanced course in the basic principles of pharmacology. Discussion will include receptor theory, enzyme activity and inhibition, structure activity relationship, pharmacokinetics, adverse reactions and drug-drug interactions.

*Credits: 3*  
*Every Fall*

#### **PTM 711 Current Technologies in Pharmaceutical Research and Development**

The healthcare professional of the 21st century must have a basic knowledge of scientific technologies that affect the community and impact the delivery of effective health care. This course will involve a combination of lectures and student presentations to explore the current areas of medical technology that are important to the healthcare professional. Topics to be covered will include the latest developments in the areas of stem cell research, gene therapy, pharmacogenomics, human cloning, therapeutic antibodies, DNA profiling and genetically modified foods.

*Credits: 3*  
*On Demand*

#### **PTM 802 Experimental Methods in Pharmacology and Toxicology**

Modern techniques used in the qualitative and quantitative evaluation of drugs and drug toxicity in animal systems. These include whole animal studies, isolated tissue techniques and analytical instrumentation.

*Credits: 3*  
*On Occasion*

#### **PTM 804 Inborn Errors of Metabolism**

This course will consider those inherited disorders which are the result of the body's failure to synthesize specific proteins (enzymes) needed for normal metabolism or the synthesis of abnormal proteins.

*Credits: 3*  
*On Occasion*

#### **PTM 905 Principles of Immunotherapy**

This course is concerned with the study of antigens and the immune system, the humoral response and the cellular response to antigen. Non-atopic immunological drug reactions and disease states characterized by abnormal immunological responses will be discussed. Research papers dealing with selected immunological topics will be assigned and discussed.

*Credits: 3*  
*On Occasion*

#### **PTM 907 Psychopharmacology**

A comprehensive course covering the clinical considerations and biochemical basis of psychotic and neurotic disorders responding to drug therapy. Emphasis to be placed on the complete animal and human pharmacology of antipsychotic, anti-anxiety, antidepressant and antimanic drugs. Appropriate stimulant and sedative/hypnotic agents and current trends and issues will be discussed. Student participation through research papers and seminars will be implemented.

*Credits: 3*  
*On Occasion*

#### **PTM 910 Toxicology of Drugs and Chemicals**

General principles of toxicology; current trends and recent developments in the prevention, detection, diagnosis and treatment of acute and chronic toxicities from drugs and chemicals; toxic drug interactions.

*Credits: 3*  
*Every Fall*

#### **PTM 917 Molecular Toxicology**

A comprehensive course which will discuss highly focussed toxin-induced intracellular mechanisms and their molecular targets. Drug- and chemical-induced gene expression, modulation of expression of various genes by chemical antidotes. This course will include detailed discussion of toxin-induced perturbations, modes of cell death, and events at subcellular molecular sites inside the cell, e.g. nuclear (including DNA degrading and repair enzymes), electron transport chain dysfunctions, and cytoplasmic compartments (ribosomes, microsomes and other cytosolic components).

*Credits: 3*  
*On Occasion*

#### **PTM 920 Molecular Pharmacology**

An advanced course in pharmacology dealing with the molecular mechanisms of drug action. The discussions will include receptor-drug interactions, importance of chirality, receptor-ligand interactions, interactions of drugs with endogenous polymers, modulators of chemical transmitters and such other topics involving molecular biology.

*Credits: 3*  
*On Occasion*

#### **PTM 925 Pharmacogenomics**

Pharmacogenomics, the union of pharmacology and genomics, is emerging as a novel medical research field. This course reviews the history and current status of the influence of hereditary factors on drug action and metabolism, as well as predisposition to diseases. It is intended to introduce graduate students to pharmacogenomics and personalized medicine through a series of lectures, case studies and students' presentations of cutting-edge technologies used in this field.

*Credits: 3*  
*On Occasion*

#### **PTM 938 Stem Cells and Regenerative Medicine**

This course is designed to introduce students to the characteristics of the various types of stem cells and their applications in basic research, drug discovery and regenerative medicine. Topics will include the origin of embryonic and adult stem cells and the cutting edge potential and applications of induced pluripotent stem cells (iPS). The course will provide details about the role of stem cells as therapeutic vehicles for treating cancer, cardiovascular diseases, Alzheimer's, arthritis, Parkinson's disease and many inherited disorders such as Huntington's, Muscular Dystrophies, and Sickle Cell disease. Students will also discuss controversial issues that pose a dilemma in the

widespread adoption and application of stem cells as potential therapy.

*The pre-requisites of PTM 704 and 705 are required.*

*Credits: 3*

*On Occasion*

## **Pharmacy Administration and Drug Regulatory Affairs**

### **PHA 010 Biostatistics**

(This course is a prerequisite for all Drug Regulatory Affairs majors.) An introductory course in statistics with emphasis on applications in the health sciences. Topics include description of data, measures of central tendency and dispersion, inferences from data, significant differences, and measures of similarity and differences among groups of data.

*Credits: 3*

*Every Fall and Spring*

### **PHA 050 Research Methodology**

A course in the design, implementation and evaluation of research. Topics include problem identification, literature review, research approaches, hypotheses, data-gathering instruments and methods, data analysis and generalization.

*Credits: 3*

*On Occasion*

### **PHA 060 Research And Thesis**

Individual research in the various areas of specialization, Pass-Fail only.

*The pre-requisites of PHA 050 and 653 are required.*

*Credits: 3*

*Every Semester*

### **PHA 070 Special Problems**

Laboratory, fieldwork or library research in the various areas of specialization. Pass-Fail only. Permission of the instructor required.

*Credits: 3*

*On Occasion*

### **PHA 601 Marketing Research and Analysis**

Insight is provided into research techniques and audits in preparing marketing and media studies and reports. A comprehensive study of marketing research principles, including sampling, questionnaire construction, surveys and panels. Readings and case studies provide practical experience in dealing with marketing research problems.

*Credits: 3*

*On Occasion*

### **PHA 603 Drug Regulatory Affairs**

(This course is a prerequisite for all Drug Regulatory Affairs courses, except PHA 661) A comprehensive introductory course which provides an overview, understanding of, and appreciation for the numerous statutes and regulations governing

drugs, medical devices and cosmetics.

*Credits: 3*

*Every Fall*

### **PHA 604 Pharmacoeconomics**

This course presents socioeconomic aspects of health care that influence need, demand and provision of health care through the private and public sectors. The course will also develop basic concepts of economic theory as an analytical tool to understand them from provider as well as consumer points of view in an evolving healthcare delivery system.

*Credits: 3*

*Every Fall*

### **PHA 607 Behavioral Pharmacy**

This course directs students towards an understanding, analysis and application of theories in organizational behavior, psychology, sociology and education as they apply to a range of problems and issues found within various work environments within the pharmaceutical industry and profession. Through lecture, reading, group work and analysis of case studies, students will be able to identify and apply relevant theory in order to solve problems that occur in organizational settings.

*Credits: 3*

*On Occasion*

### **PHA 613 Marketing Management**

Designed to develop an understanding of the function and role of product management systems, including, among others, the following topics: product cycle analysis, preparing the annual marketing plan, financial tools for product management, sales coordination and product management, control of the product marketing plan.

*Credits: 3*

*On Occasion*

### **PHA 614 Health Literacy**

This course offers a problem-based approach to meeting the health information needs of consumers with low health literacy. Issues addressed are difficulties in sending or receiving written or spoken information containing either words, numbers, or graphs; ESL; non-communicative consumers and health practitioners; and cultural disparities which affect communication.

*Credits: 3*

*On Occasion*

### **PHA 615 Consumer Behavior and Contemporary Healthcare Issues**

This class will present contemporary concepts, principles and research related to consumer behavior that could be applied in developing marketing tools and techniques for improving consumer access, participation and utilization of the healthcare system. It introduces students to individual and group level theories that explain and change consumer behavior. The course also presents relevant research tools and methods for

conducting investigations in the area of consumer behavior. It requires students to synthesize, integrate and apply related knowledge and skill toward developing, analyzing, and reporting measures specific to consumer behavior related outcomes. Upon completion of this course, students will be able to design, conduct and evaluate projects or initiatives for changing consumer behaviors.

*Credits: 3*

*On Occasion*

### **PHA 645 Internship in Drug Regulatory Affairs**

This course is designed for those graduate students who have an interest in employment opportunities in the pharmaceutical industry or government. The student works in an on-the-job setting on carefully planned work activities designed to provide a basic understanding of the drug regulatory environment, process and outcome. A report of these work activities is required at the completion of the course. Pass-Fail only.

*Credits: 3*

*On Occasion*

### **PHA 651 Pharmaceutical Labeling, Advertising and Promotion**

A comprehensive course which reviews prescription and OTC drug labeling, advertising and promotion regulations. Examines the development and clearance of labeling and advertising pieces (container labels, package inserts, journal ads, direct mail, visual aids, reminder advertising, etc.). Discussion of principles of Fair Balance, Brief Summary and Full Disclosure. Students will be required to prepare advertising and promotional pieces. The role of the regulatory affairs department, product manager, advertising agency, etc., will be discussed. Review of institutional advertising, preapproval advertising, prescription drug advertising to the consumer (PDAC), comparative advertising.

*The pre-requisite of PHA 603 is required.*

*Credits: 3*

*On Occasion*

### **PHA 653 Seminar in Social and Administrative Sciences**

Students generate solutions to current problems in pharmaceutical care, the pharmaceutical industry and public policy, and support their views with evidence that reflects concepts, principles, theories and philosophies from the social/behavioral/administrative sciences. Based upon their research, students will prepare written reports, give multimedia class presentations and conduct class discussions.

*Credits: 3*

*Every Fall and Spring*

### **PHA 654 FDA Regulation of Over-the-Counter Drugs, Medical Devices and Dietary Supplements**

Provides the participants with an understanding of, and an appreciation for, the regulation of over-the-counter drugs, medical devices, cosmetics and

animal health drugs as legislated by the Federal Food, Drug, and Cosmetics Act and its amendments and the Fair Packaging and Labeling Act.

*The pre-requisite of PHA 603 is required.*

*Credits: 3*

*Every Spring*

#### **PHA 655 Chemistry, Manufacturing and Controls (CMC) Regulatory Affairs**

This course describes various aspects of CMC regulatory affairs as they relate to the development, approval and marketing processes for drugs in the U.S. Topics include: FDA vs. pharmaceutical industry viewpoints on CMC regulatory affairs; quality issues related to CMC regulatory affairs; organization of the CMC regulatory function and role of the CMC regulatory professional; CMC regulations and guidance; format, required, required content and scientific considerations for the CMC sections of INDs and NDAs for traditional dosage forms; and an overview of CMC requirements and considerations for other submissions (i.e. generics, biologics, animal drugs, drug master files, devices and international dossiers). Offered on occasion.

*The pre-requisite of PHA 603 is required.*

*Credits: 3*

*On Occasion*

#### **PHA 656 Current Enactments, Regulations and Guidances**

In the last few years, there has been a plethora of new and revised congressional acts and FDA-administered rules and guidance towards the development and approval of drugs in the U.S. This course will focus upon these current requirements. There will be extensive discussion of the Food and Drug Administration Modernization Act (FDAMA); selected Safety, Efficacy and Quality International Conference on Harmonization (ICH) Guidance; selected FDA Guidance prepared under the auspices of the various FDA Coordinating Committees; and selected Post-Approval Changed (PAC) Guidance. Current draft requirements and the resulting future regulatory direction will also be considered.

*The pre-requisite of PHA 603 is required.*

*Credits: 3*

*On Occasion*

#### **PHA 657 Principles and Practices of Regulatory Compliance and Enforcement**

This course emphasizes the history, development, implementation, monitoring, operational procedures and audit techniques of investigation and enforcement. Enforcement issues and problems are addressed.

*The pre-requisite of PHA 603 is required.*

*Credits: 3*

*Every Spring*

#### **PHA 658 International Drug Regulatory Affairs**

The increasing globalization of product development and marketing means that companies

that manufacture and market products in many different countries must comply with an ever-increasing spectrum of laws and regulations. The borders that divide nations seem to be shrinking as the means of rapid communication increase. But the lack of regulatory consistency across the globe makes it extremely difficult for pharmaceutical manufacturer's to implement a globally acceptable product design. The purpose of this course is to provide an overview of global regulatory requirements for U.S. and EU for product registration. Topics covered will include the understanding of the ICH (International Conference on Harmonization) and CTD (Common Technical Document) as well as some basic understanding of international product registration requirements. Following this course, students should be able to understand the fundamentals of global regulatory issues.

*Credits: 3*

*On Occasion*

#### **PHA 660 Mechanics of Preparing INDs and NDAs**

This course provides an in-depth assessment and analysis of the requirements of the investigational new drug (IND) and new drug applications (NDA). Component parts, appropriate format, assembly and submission of each is emphasized.

*The pre-requisite of PHA 603 is required.*

*Credits: 3*

*Every Fall*

#### **PHA 661 The American Pharmaceutical Industry**

This course provides a comprehensive view of the key activities in which major pharmaceutical companies are involved, e.g., research and development, pilot manufacturing, manufacturing and packaging, quality assurance, marketing, sales, distribution, regulatory affairs and pharmacy relations.

*Credits: 3*

*On Occasion*

#### **PHA 662 Ethics in Pharmaceutical Industry**

A comprehensive course designed to investigate the role ethics play in today's pharmaceutical industry. Students will explore case studies related to past, present, and potential future ethical dilemmas concerning clinical trials, patient safety, intellectual property rights, and marketing and advertising practices. Course will also examine issues concerning drug pricing and other public interests that challenge current industry practices worldwide.

*Credits: 3*

*On Occasion*

#### **PHA 663 Food and Drug Law**

This course is designed to provide a basic working knowledge of the domestic laws regulating food, drugs, cosmetics, biologics/blood and medical devices. It has a practice related direction providing a grass roots understanding of the legislative and regulatory processes through a comprehensive

review of the relationships between FDA, the health care industry, consumers and their interest groups and the U.S. Congress.

*Credits: 3*

*On Occasion*

#### **PHA 665 Healthcare Data Management and Analysis**

Students will learn data management and the most commonly used analysis techniques utilizing SAS or SPSS. Various type of data employed in pharmacy-related evaluation and its advantages and disadvantages will be discussed. Readings and assignments will provide hands-on experience in dealing with data from randomized clinical trials, hospital and pharmacy administrative issues, payer claims, and large surveys. Data analysis to address issues in areas such as pharmacotherapy effectiveness, adverse drug effects, health care utilization, and health care cost will be discussed and practiced.

*The pre-requisite of PHA 010 is required.*

*Credits: 3*

*On Occasion*

## ADMISSION

### Eligibility

1. Holders of the baccalaureate degree, or its equivalent, from an accredited college or university are eligible to apply for admission. The program specializations in Pharmaceutics usually require an undergraduate degree in pharmacy, chemistry, biology or a related science specialty. Certain courses in these programs have specific undergraduate prerequisites such as Organic Chemistry, General Physics and Calculus.
2. The applicant must have an acceptable record in undergraduate studies (preferably a "B" average or better) as reflected in official transcripts of all colleges and universities attended. Attention is given to overall grade averages, grade trends during undergraduate study and areas of scholastic strength. Consideration is also given to professional accomplishments of the applicant since the time of completion of undergraduate studies.

### Admissions Procedures

Applicants are strongly encouraged to submit an application online at [www.liu.edu/brooklyn/admissions/apply](http://www.liu.edu/brooklyn/admissions/apply). A paper application may be obtained by visiting the Office of Admissions, LIU Brooklyn, 1 University Plaza, Brooklyn, NY 11201-5372, e-mailing [gradadmissions@brooklyn.liu.edu](mailto:gradadmissions@brooklyn.liu.edu), or by calling 718-488-1011. A bachelor's degree (or its equivalent) from an accredited institution, indicating an acceptable record, is necessary to be considered for admission to the graduate programs. Additional requirements are described in the eligibility section above.

The completed application must be submitted with a personal statement of approximately 500 words. Applicants must also submit official transcripts from all colleges and universities attended showing all undergraduate and graduate coursework taken and degrees received, if any. Three completed letters of recommendation are required. An application fee of \$40.00 is required. If the applicant mails or submits a paper application in person, they will be assessed a nonrefundable fee of \$40.00. LIU Brooklyn encourages students to self-manage their application, which means it is the responsibility of the applicant to collect all required documents needed for admission and manage where documents are to be mailed. Students needing assistance and clarification are encouraged to email the Graduate Admissions Office at [gradadmissions@brooklyn.liu.edu](mailto:gradadmissions@brooklyn.liu.edu).

Most graduate programs are available each semester on a rolling admissions basis with applications accepted as long as space is available.

However, it is strongly encouraged that applications and supporting materials be submitted as early as possible. Applications and all supporting documents from international applicants must be received by May 1st for Fall admission and by November 1st for Spring admission.

Applicants for all graduate pharmacy programs must submit GRE scores from the General Aptitude Test. For information on the GRE, contact the Educational Testing Service at GRE-ETS, P.O. Box 6000, Princeton, NJ 08541-6000 or at [www.ets.org/gre](http://www.ets.org/gre).

A student will be classified as matriculant when accepted into a degree program. Students admitted with technical or academic deficiencies (e.g., incomplete official transcripts) will be classified as matriculants with conditions, pending fulfillment of those conditions. Technical deficiencies must be removed before the end of the first semester of enrollment. Academic deficiencies must be satisfied before the completion of 12 credits required in the degree program or within one year. Students are in good academic standing as long as they are permitted to continue in attendance in matriculant status.

In addition, students holding a bachelor's degree from accredited colleges and universities may be admitted as nonmatriculated if the course work is intended to help them in their jobs. Special Students must meet the same standards of admission as those admitted to degree candidacy. Granting Special Student status for either technical or academic reasons does not obligate the College to give such applicants matriculant status. Admission of a Special Student to matriculant status will depend upon the quality of all of the student's credentials as well as performance in courses taken as a Special Student.

### Notification of Acceptance

Students will be notified of the admissions decision shortly after all the necessary documents (application, transcript, official test score report and letters of recommendation) are received. Once a candidate is accepted, he or she is required to make a deposit of \$500 to reserve a place in the entering class. This deposit is applied to the first semester's tuition. It is not refundable should the student decide at a later date not to attend the LIU Brooklyn campus.

#### International Students

Applications are welcome from international students who hold the equivalent of a four-year bachelor's degree. To be considered for admission, undergraduate transcripts/marksheets for each year of study, including degree conferral (diploma/degree certificate) are required. All records must be translated into English and be original or copies of the original, certified/attested by an official of the school issuing that record or the Consulate/Ministry of Education of the issuing country. A course-by-course evaluation, completed

by an acceptable international credential evaluation agency, is recommended, but not required, on all transcripts/marksheets from colleges or universities outside of the United States. A complete list of acceptable agencies can be requested from the Office of Admissions or found on [www.liu.edu/brooklyn](http://www.liu.edu/brooklyn). All international students for whom English is not a native language are required to take the Test of English as a Foreign Language (TOEFL) administered by the Educational Testing Service or the International English Language Testing System (IELTS) examination. Information on the examinations may be obtained by visiting [www.ets.org](http://www.ets.org) and [www.ielts.org](http://www.ielts.org), respectively from American consulates and embassies abroad, or from the United States Information Service (USIS) in each country. Proficiency in English must be demonstrated. A student who needs additional study in English may be required to take English courses for foreign students at LIU before or concurrently with an academic program.

Applications from international students must be accompanied by a nonrefundable \$40.00 application fee and received no later than May 1 for the Fall semester and November 1 for the Spring semester. When credentials are complete and found to be satisfactory, the applicant will be required to submit a \$500 deposit and a certified statement of financial support. The deposit will be applied to tuition and is not refundable should the student decide not to attend the University. An I-20AB or IAP-66 form will be issued upon receipt of the deposit and statement of financial support. Students should not make plans to come to the United States until they have received the appropriate non-immigration forms.

Health insurance coverage is compulsory for all international students and their dependents. Information pertaining to the health insurance coverage may be obtained from the Office of International Students, which assists students on campus.

Students holding F-1 (student) visas are required by law to be fully matriculated and be registered for at least nine credit hours per semester.

Students should be aware of tuition rates as well as of the relatively high cost of living in and around New York City, and come prepared to finance their education.

#### Advanced Standing

Graduate courses taken at other graduate schools prior to admission to LIU Pharmacy may be transferred for credit. Such courses may be used to meet requirements, provided the student requests the transfer of credit in writing at the time of application. Transfer credit must be in advanced work and is limited to six credits for courses with a grade of "B" or higher completed within the three-year period prior to admission to LIU Pharmacy. All transfer credits are subject to approval by the Program Director and Associate Dean.

## ACADEMIC REGULATIONS

### Registration

Newly admitted students to the graduate programs should closely follow the registration procedures provided to them. It is highly recommended that they consult with the Program Director about course selection, and work with the Coordinator of Graduate Programs and the Program Director to learn the specific requirements of the selected program.

Registration beyond the first semester depends on satisfactory progress in fulfilling college graduate programs' conditions. For further information about grade requirements, see the section "Academic Standards". Students not fulfilling the requirements should make an appointment with the Program Director before registering for courses in order to obtain approval and update the progression worksheet maintained in the Office of Graduate Studies.

During the period of late registration (see academic calendar), a student may register with the consent of the college's Coordinator of Graduate Programs. After this period, consent of the Associate Dean is required.

#### Student Responsibility

The student is responsible for knowing deadlines, degree requirements, and enrolling for courses listed under the degree program. The student is held responsible for knowing the university regulations with regard to the standard of work required for continuance in the graduate program. For additional information students should consult with the Office of Graduate Programs.

#### Change of Plan

A student desiring to transfer from one LIU Pharmacy graduate program to another must be formally accepted by the Program Director of the graduate program to which admission is sought and by the Associate Dean of the College. The student is expected to notify the Program Director of the program that he or she is leaving.

#### Cancellation of Courses

LIU Pharmacy reserves the right to cancel undersubscribed courses or courses for which no faculty are available to teach. When it does so, there is no program change fee.

### Maintenance of Matriculation

It is expected that students will fulfill the requirements for advanced degrees by registering over successive semesters. Degree candidates may find themselves unable to register for courses during one or more semesters, or to complete all course work because they are working on their thesis. To remain on an active status and to qualify for a degree under the requirements in effect when admitted, such students must register each

semester by writing "Maintenance of Matriculation" on the registration form and paying a \$250 fee for each such semester. A student who fails to register under "Maintenance of Matriculation" will be classified as inactive. Re-admission will require the submission of a new application for admission and a review of the student's record and qualifications with respect to the requirements for admission in effect at the time of readmission.

Students serving in the Armed Forces of the United States maintain matriculation automatically during the time of their service. They are required, however, to inform the Office of Graduate Studies of the dates of their entrance into military service and termination of active duty.

Maintenance of matriculation without attending classes is limited to one year. Approval for extension of this time limit must be obtained from the Associate Dean or a designated representative.

The above information on maintenance of matriculation does not apply to Ph.D. candidates who have begun work on their doctoral dissertation.

### Withdrawal and Refund

#### Withdrawal from Courses

Students who fail to withdraw officially from a course by the date so indicated by the Office of Graduate Studies, and do not attend and/or meet the course requirements have, in fact, earned an "F," and will receive that grade designation. The grade "W" will be given to students who are in compliance with official withdrawal procedures. Students themselves must initiate formal withdrawal procedures. Failure to do so can result in loss of possible refunds or inaccurate records of academic performance (or both). Students must obtain a Withdrawal Form from the Office of Graduate Studies and have this form signed by the instructor of the course(s) concerned.

A student who wishes to withdraw from the College should notify the Office of Graduate Studies in writing. Otherwise, honorable dismissal will be withheld. No certificate or transcript of record will be granted, however, until all financial indebtedness is settled. If a student withdraws from the College prior to the completion of a semester, he or she must file the appropriate Withdrawal Form with the Registrar.

A student who withdraws from a course in which he or she is doing satisfactory work will be given the grade W. A student registered for a course is considered to be in attendance until the date of his or her official withdrawal.

Withdrawal from courses is permissible at any time up to deadline established by the Office of Graduate Studies, but a student who is doing failing work when he or she requests authorization to withdraw may be given the grade WF. The symbol UW is assigned when a student unofficially withdraws from a course. Neither WF nor UW is computed in the student's average.

Students who are on academic probation when they withdraw from all courses are not eligible for readmission without their Dean's approval.

#### Withdrawal to Enter the Armed Forces

Students withdrawing to enter into the Armed Services should note carefully the following regulations outlining the position of the College with regard to such withdrawal:

1. Application for withdrawal in good standing must be made at the Office of the Registrar. The official date of withdrawal is the date on which the application is made.
2. Students may receive a proportionate refund.
3. Specific policies may be obtained from the Office of the Registrar.

#### Refunds

When a student withdraws, the University will refund tuition according to the schedule shown on the pages following Tuition and Fees listings.

Registration, graduation and university fees are not subject to proration and are not returnable.

Date of withdrawal will be considered the day on which the student has completed all Withdrawal Forms and has submitted these forms to the Office of the Registrar.

A student may be dismissed at any time for misconduct of such a nature as to be prejudicial to the College. In the event of such dismissal, fees will not be refunded in whole or in part.

### Grades

Credit is granted for courses completed with the grade A, A-, B+, B, B-, C+, or C. The F grade signifies failure. P (passed for credit) may be used to mark completion of work in certain research practicums, seminars, workshops and thesis courses.

INC (incomplete) may be used as an interim grade for the first half of a two-semester course, for failure to complete all course requirements, and for thesis courses before acceptance of the thesis. Any other failure to complete the course requirements (e.g., the submission of a term paper) may be recorded as INC. Absence from the final examination will be recorded as ABS. Except in thesis courses, grades INC or ABS that have not been replaced by a letter grade within one year may be changed only by repeating the course.

A student may not repeat a course without permission of his or her Program Advisor and/or the Associate Dean. If a student, with appropriate permission, repeats a course more than once, all grades except the first will be computed in the student's average. Satisfactory completion of the course does not eliminate the original INC or ABS from the student's record.

NGR is a temporary mark when no grade has been submitted. AUD recognizes that a course has been audited.

The symbol W is assigned when students officially withdraw from a course in which they were doing satisfactory work. The symbol UW is

assigned when students unofficially withdraw from a course. The UW is not computed in the student's average.

The College's grade-point average is employed to determine the average grade status of a student. The grade A corresponds to a 4.000 quality point equivalent, A- to 3.667, B+ to 3.333, B to 3.000, B- to 2.667, C+ to 2.333, C to 2.000 and F to 0.000. P, INC, ABS, W and UW grades do not affect the grade point average.

The quality points to which a student is entitled are computed by the formula  $X = N \times Y$ , where X is the number of quality points, N the quality point equivalent assigned to the grade, and Y the number of credits. The grade point average is obtained by dividing the sum of the quality points received in all courses by the total number of credits, including unrepeatable F's.

Grade point average computations are carried to the third decimal place from which rounding takes place to the second decimal place. For example, a computed grade point average of 2.994 will be rounded down to 2.990. A computed grade point average of 2.995 will be rounded up to 3.000. On all official LIU transcripts, a grade point average will be displayed to three decimal places with the third decimal place always being zero due to rounding.

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## Repeating Courses

Students may repeat any course with the permission of their advisers. To repeat a course more than once, they must have permission of the Program Director and Associate Dean. Credit will be earned only once, and the second grade—whether higher or lower—will be computed in the student's average. After a student takes a course a second time, all grades except the first will be computed in the student's average.

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## Academic Standards

The College reserves the right to dismiss, at any time, a student whose academic record is unsatisfactory. To be in good academic standing, a student must make appropriate progress toward fulfilling all requirements of the graduate program (M.S. or Ph.D.) in which he/she is enrolled. Failure to do so will be cause for dismissal. Academic probation is the initial official act for a student failing to make satisfactory progress. Students will be duly notified by the Program Director that they have been placed on probation.

A graduate student will be placed on probation for:

1. failure to maintain an overall cumulative grade-point average (G.P.A.) of 3.000 and/or,
2. earning a grade of C+ (or less) in more than two courses (these courses may be repeated with the permission of the Program Director and Associate Dean).

A graduate student will be dismissed from the program for:

1. failure to rectify probationary status (i.e., obtaining G.P.A. of 3.000 within two semesters.
2. receiving "F" grade in any course.
3. failure on the qualifying examination (for students in the Ph.D. program). Note: the student will be allowed to repeat the examination. However, if a student fails the examination more than once, he/she will be dismissed from the program.
4. failure on the comprehensive examination (for students in the M.S. program who choose the non-thesis option). Note: the student will be allowed to repeat the examination. However, if a student fails the repeat examination, he/she will be dismissed from the program.

A student may appeal an academic dismissal once by petition to the Associate Dean of the College. The petition should present a thorough analysis by the student of the reasons for having failed to maintain satisfactory academic progress and a comprehensive plan for rectifying his/her deficiencies within a reasonable period of time, preferably after one semester of study but not exceeding two semesters of study, and that conforms with all other academic regulations of the College. The petition is considered by the Associate Dean who may request that the student appear in person to substantiate his/her position and answer questions. Students are advised that successful appeals of academic dismissals are rare and usually occur only in those circumstances where substantive underlying causes for unsatisfactory academic progress were previously unknown to the College. Generally, in cases where substantive underlying causes exist for unsatisfactory progress, an extension of academic probation will have been granted to allow the student additional opportunity to remedy his/her noncompliance with satisfactory academic progress. Decisions of the Associate Dean that a student believes may demonstrate arbitrary and capricious treatment or to be fundamentally unfair may be appealed, as a final step, to the Dean of LIU Pharmacy.

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## Comprehensive Examination for Master's Students

Passing the comprehensive exam at the Master's level is required for the M.S. degree for non-thesis students.

### The Comprehensive Examination Process

The comprehensive examination is given twice each year. Non-thesis students should apply for the comprehensive exam in their final semester. Students should contact the Coordinator of Graduate Programs for forms, application deadlines and examination dates.

### Eligibility Requirements

1. Students must have a cumulative G.P.A. of 3.000 or above.
2. Students must be in the process of completing

all of their required coursework for their degree in the semester in which they are planning to take the examination.

### Passing Scores

A score of 75 or higher is required to pass the examination.

If a student has not successfully completed his/her coursework in the semester during which he/she takes the exam, he/she will have to repeat the coursework and re-take the exam.

If a student fails the exam and wants to review the exam, he/she should do so within 7 days following receipt of his score.

### Reporting of the Scores

The Office of Graduate Programs shall inform students, in writing, of their scores.

## GRADUATION REQUIREMENTS

Master of Science students may elect either a Thesis Option or Non-Thesis Option (see below). Doctoral students should consult the program for the Plan of Study (see Graduate Curriculum).

The responsibility for properly fulfilling the requirements for degrees rests entirely with the student. Students generally meet the requirements announced in the graduate section of the LIU Pharmacy Bulletin for the academic year in which they were matriculated or readmitted. Students for whom graduation requirements change during their progress to a degree may, with the permission of the Associate Dean, choose requirements in effect at the time of admission or those in effect at the end of the course of study.

Exceptions to the provisions of this section of this Bulletin may be made only with the prior written sanction of the Associate Dean on the recommendation of the appropriate Program Director.

### Thesis Option

1. Completion, with a minimum cumulative grade point average of 3.000, the required curriculum in the designated area of specialization, and 6 credits of research and thesis.
2. Completion of a Master's Thesis which demonstrates the candidate's ability to select, organize and present the results of investigations in his or her field of specialization. The following general information is intended for the student's guidance in the preparation of the thesis:
  1. The student should have completed at least 12 credits toward the degree before submitting a proposal.
  2. The student should obtain the latest copy of Supplementary Information and Suggestions Concerning the Master's Degree Thesis and Proposal from the Office of Graduate Studies.
  3. The approval of the Program Director must be obtained for the thesis after the submission of the proposal.
  4. The sponsoring committee must consist of three members of the graduate faculty of whom two must be from the full-time graduate faculty. The Chair of the committee may be selected by the student or appointed by the Program Director.
  5. The Chair of the sponsoring committee supervises the student during the period of thesis preparation.
  6. Upon completion of the thesis all members of the sponsoring committee must read and approve the thesis before acceptance.
  7. The subject of the thesis should be of significance and the completed manuscript should be representative of a high degree of

scholarly attainment.

8. Students must conform to the submission dates in the thesis proposal outline and the dates given in the calendar of this bulletin.
9. The student is required to make an oral defense of the thesis before the sponsoring committee.

### Non-Thesis Option

1. Completion, with a minimum cumulative grade point average of 3.000, of the required curriculum in the designated area of specialization.
2. Passing a written comprehensive examination. This examination will be given twice annually, generally in November and April. Dates may be obtained from the Office of Graduate Studies.

*Note: Students should refer to the information on individual Master of Science programs in the Graduate Curriculum section of this bulletin for specific information and course work requirements in each area of specialization, and for information regarding any other degree requirements that may pertain to their areas of specialization.*

### Residency Requirements

Students are expected to complete all of their courses at LIU Pharmacy. Students may, however, receive a maximum of six transfer credits from other institutions. Permission to take such courses at other institutions while in residence at the College must be obtained from the Program Director and the Associate Dean.

The M.S. curricula are projected for completion within a two-year period.\*

For the period of study for the doctoral programs, students should consult the program (see Graduate Curriculum). Nine credits are considered a full-time load for academic purposes. Full-time enrollment status for graduate students for all federal and state financial aid programs is defined as 12 credits per semester. Permission of the Program Director is required to carry more than 12 credits.

*\*While all academic and other requirements for the degree of Master of Science can be completed in two semesters and summer work, the maximum allowable time for the completion of all requirements and the awarding of the degree is five years from the date of first matriculation (exclusive of time spent in the armed forces), unless the Associate Dean approves an extension. The maximum allowable time for the completion of all requirements for the Doctoral degree is eight years from the date of first matriculation unless the Associate Dean approves an extension. Any course outside the time limit will not count as credits toward the degree unless approved in writing by the appropriate Program Director and Associate Dean.*

### Changes on Academic Records

Students have until the time of their graduation to have changes made on their academic records. Once a student has graduated, the academic record is frozen and cannot be changed retroactively.

**INTEGRATED STUDENT FINANCIAL SERVICES**

Through a mix of personal and online services, the Office of Integrated Student Financial Services has developed a system that supports our students in managing all aspects of financing their education. The goals and objectives of the Office is to help students obtain maximum eligible financial aid awards, provide comprehensive counseling sessions, optimize payment arrangements, disseminate financial aid and billing information clearly and understandably, support the University's mission of access and excellence, and increase and assist in student retention efforts.

Using the University's convenient My LIU portal at <https://my.liu.edu>, you can view your financial aid status and account activity, pay your bill online, make online appointments with counselors, and view "to do" items and "holds" that help you complete required tasks to ensure your continued enrollment at LIU Brooklyn. In addition to our online student portal, our experienced financial aid counselors will work closely with you and your family to ensure you receive world-class service throughout your college experience.

**GRADUATE PROGRAM TUITION AND FEES**

**Tuition & Fees**

Students are billed for tuition and fees at the time of registration. Room and board charges are reflected at the time of room assignment. **Students must make satisfactory payment arrangements prior to the start of each term or before moving into residence halls to remain in good financial standing.**

The University accepts payment by check, money order, AMEX, VISA, Discover, or MasterCard at the Office of Integrated Student Financial Services or online through your My LIU account.

**General Tuition and Fees**

Tuition, per credit, per semester	\$1,285.00
Ph.D. in Pharmacy (per credit, per semester)	1,310.00
Tuition Deposit fee (nonrefundable)	200.00
Application fee (nonrefundable)	50.00
Flex dollar program (students enrolled in 9 or more credits), Fall 2013 only	25.00
University fee, per semester:	
Students carrying 12+ credits	850.00
Students carrying less than 12 per term	425.00
Graduate Audit fee, per credit	555.00
Maintenance of Matriculation fee, per term	250.00
Life Experience fee:	
per credit	250.00

**Residence Life**

**RESIDENCE HALLS**

Deposit (submitted with housing application)	\$ 300.00
Fall and Spring Accommodations, per semester:	
Standard Conolly:	

Double	3,682.00
Triple	2,775.00
Suite Conolly:	
Double	4,386.00
Triple	4,008.00
Quad	4,182.00
Apartment Conolly:	
Double	5,365.00
Triple	4,886.00
Quad	5,518.00
Suite Hoyt:	
Double	5,447.00
Triple	5,161.00
Quad	5,335.00
Quintuple	5,732.00
Apartment Hoyt:	
Double	6,895.00
Triple	6,895.00
Fulton Apartment:	
Studio	9,400.00
1 Bedroom	10,274.00
2 Bedroom	9,476.00 - 10,403.00
3-6 Bedroom	8,961.00 - 9,373.00
Intersession (per week)	268.00
Summer Accommodations, per session:	
Suite Conolly:	
Double	1,755.00
Triple	1,685.00
Quad	1,612.00
Apartment Conolly:	
Double	2,010.00
Triple	1,867.00
Quad	1,785.00
Suite Hoyt:	
Double	2,377.00
Triple	1,795.00
Quad	2,142.00
Quintuple	2,458.00
Apartment Hoyt:	
Double	2,765.00
Triple	2,510.00

**MEAL PLANS, per term**

**Fall and Spring, per term:**

Residential Meal Plan 1 (unlimited meals plus 300 Flex Dollars)	2,350.00
Residential Dining Dollars	300.00

Resident students not living in apartment accommodations are required to participate in a meal plan. Declining dollars can be used at point of sale locations across the campus.

**Other Fees**

Transcript of record (on-line, in person, or via mail), per request	\$7.00
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Replacement I.D. card	25.00
Late graduation application fee	50.00
Reinstatement of cancelled registration	100.00*
Delayed registration fee	200.00*
Late payment fees:	
First (assessed 45 days into the term)	50.00*
Second (assessed on the last day of the term)	100.00*
Deferred final examination fee per examination (maximum \$60.00)	20.00
General Comprehensive Examination fee	25.00
Returned check fee	25.00
University Payment Plan fee	35.00
Diploma Replacement fee	35.00

Repayment of returned checks and all future payments to the University from a student who has presented a bad check must be tendered via bank check, certified check, money order, AMEX, VISA, Discover or MasterCard.

\*Students are expected to clear their bills before the start of classes. In the event that a student fails to do so, late payment fees will be assessed. Registered students who have not cleared their bill by the 45th day into the term will be obliged to pay a late payment fee of \$50.00. Bills not cleared by the last day of the term will be assessed an additional late fee of \$100.00. If a student's registration is canceled, the student will be required to pay a reinstatement fee of \$100.00 plus the late payment fees. If the reinstatement takes place one year or more after the semester has ended, current tuition rates will be charged. Any student who deliberately fails to register but attends classes with the intention of registering late in the term will be responsible for paying the delayed registration fee of \$200.00. If the registration takes place one year or more after the semester has ended, current tuition rates will be charged.

**Student Health Insurance**

Health Insurance:

Rates for the Annual Plan	1599.00
Rates for the Spring Semester (newly enrolled students), covers the policy period 1/1/14 - 8/14/14	1030.00
Rates for the Summer Semester, covers the policy period 5/1/14 - 8/14/14	452.00

Health insurance (Compulsory for domestic resident students, all international students, intercollegiate athletes, and students assigned field work in a health core curriculum). Charges are billed for an annual plan in the Fall semester, covering the policy period 8/15/13 - 8/14/14. Charges are not reduced if a student does not reside in the Residence Hall for the Spring semester, or is no longer in a health core curriculum, since coverage continues to be effective over the full policy period.

**Withdrawal Policy**

If you register for courses and decide not to attend, you must officially withdraw your registration prior to the end of the first week of classes to avoid liability. You can withdraw online using your My LIU account through the first week of the term. After the first week of classes, you must complete an **Application for Withdrawal Form** and receive official approval from the Office of the Registrar on your campus. **Non-attendance and/or non-payment do not constitute official withdrawal from the University.**

When a student withdraws, the University will refund tuition and fees as indicated in the following schedule.

**LIU Institutional Refund Schedule**

<b>Time of Withdrawal</b>	<b>Fall/Spring terms</b>
Cancellation prior to beginning of term or session	Complete refund except for deposit.
During 1st calendar week	100%
During 2nd calendar week	75%
During 3rd calendar week	50%
During 4th calendar week	25%
After 4th week	No refund

<b>Time of Withdrawal</b>	<b>3-Week terms</b>
Cancellation prior to beginning of session	Complete refund except for deposit.
Day 1 of Term	100%
Day 2 thru 8 of Term	60%
After Day 8 of the Term	No refund

<b>Time of Withdrawal</b>	<b>4-, 5- or 6-Week terms</b>
Cancellation prior to beginning of semester or session	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	60%
Day 10 thru 16 of Term	25%
After day 16 of the Term	No refund

<b>Time of Withdrawal</b>	<b>7- or 8-Week terms</b>
Cancellation prior to beginning of session	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	70%
Day 10 thru 16 of Term	30%
After day 16 of the Term	No refund

<b>Time of Withdrawal</b>	<b>10- or 12- Week terms</b>
Cancellation prior to beginning of session	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	80%

Day 10 thru 16 of Term	60%
Day 17 thru 23 of Term	25%
After day 23 of the Term	No refund

<b>Time of Withdrawal</b>	<b>Weekend College</b>
Cancellation prior to beginning of term	Complete refund except for deposit.
Day 1 thru 2 of Term	100%
Day 3 thru 9 of Term	70%
Day 10 thru 16 of Term	30%
After Day 16 of the Term	No refund

<b>Time of Withdrawal</b>	<b>Short-Term Institutes (3 weeks or less)</b>
Cancellation prior to beginning of first class	Complete refund except for deposit.
Day 1 of Term	100%
Day 2 of Term	80%
After Day 2 of the Term	No refund

<b>Time of Withdrawal</b>	<b>Continuing Studies</b>
Cancellation prior to beginning of first class	Complete refund except for deposit.
Prior to start of second class	80%
After second class session	No refund

The University will make all feasible efforts to conduct suitable academic services in the event of an unanticipated interruption. If the University is unable to provide education services to the Campus students because of a natural catastrophe, employee strike, or other conditions beyond its control, tuition and fees will be refunded in accordance with a reasonable refund schedule to be determined at that time.

**Financial Obligations**

Students are liable for all charges incurred at the time of registration or room assignment. Your My LIU account makes it easier than ever to manage your financial obligations. To view your current account balance, simply log into your My LIU account online at <https://my.liu.edu> and click on the **Account Inquiry** link in the **Finances** section of your **Student Center** homepage. Students must make acceptable payment arrangements or officially withdraw prior to the start of classes to remain in good financial standing. Acceptable payment arrangements include:

- Payment in full;
- Approved financial aid covering all charges;
- Signed and approved University Payment Plan Agreement Form; or
- Participation in an approved third-party payment agreement.

A student who complies with any of the above shall be considered in good financial standing, so long as all terms and conditions are met throughout the term. All payment arrangements must be completely satisfied in accordance with your University authorized payment agreement or fees and/or penalties may be applied. If your account becomes seriously past due and no arrangements are made, the University will refer it to an external collection agency or law firm, where additional fees and penalties may be charged to your account. The University’s policies and procedures governing Student Financial

Services can be found online at: [www.liu.edu/SFS](http://www.liu.edu/SFS).

**Payment Arrangements**

LIU offers convenient options to pay your account balance due. We offer many different payment methods, including check, all credit and debit cards, ACH, money order, and wire transfer.

**My LIU:** You can use your My LIU account to securely pay your balance online at [my.liu.edu](http://my.liu.edu) using a check, credit or debit card by clicking on the **Make a Payment** link from your **Student Center** homepage or from within the **Account Inquiry** section. To log into the Payment Gateway, enter your My LIU user name and password. From here, you may also set up an authorized user account so that a relative, guardian, or employer can pay any outstanding balance on your behalf. If you need assistance with making a payment online, please visit the **Center for Student Information** website at <http://csi.liu.edu>.

**Payment by Mail:** If paying with a check or money order by mail, please date the payment appropriately and make it payable to **Long Island University**. Any payment not honored by the bank is subject to a \$25 returned item fee and may restrict your future payment options to certified check, money order, or credit card. You may also receive an additional charge from your financial institution. The University is not responsible for fees assessed by your bank.

**Third Party Payments:** The University will temporarily clear student account balances if presented with written authorization from a third party or sponsoring company that intends to make a payment on your behalf. Students must submit official written authorization and complete a Deferred Payment Plan Agreement Form, along with payment for any remaining balance due. Additional information on third party payments can be found online at [www.liu.edu](http://www.liu.edu).

**Payment Plans**

The University offers two basic types of interest-free payment plans to assist students with managing the cost of their education each term:

- **Monthly Plans** are offered to students who make payment arrangements before the start of the term. Monthly Plans provide the most affordable payment options to our students and immediately place you in good financial standing. The balance is spread across 4-6 equal monthly installments with at least two payments due prior to the start of the term.
- **Term Plans** are offered to students who need to make payment arrangements at or after the start of the term. Term Plans should only be used as a last resort because the number of installments is limited to 2-3 monthly payments. In addition, your total balance due must be covered by an appropriate combination of approved aid, applied aid, and/or an initial student payment.

The University must approve your signed Payment Plan Agreement Form and receive your first initial payment for your account to remain in good financial standing. There is a \$35.00 enrollment fee per term that is due with your first payment.

## FINANCIAL AID

Financial Aid is awarded on an annual basis in the form of scholarships, grants, loans and part-time employment. Assistance is offered to students admitted into eligible graduate degree and advanced certification programs at LIU Brooklyn.

### Application Process

All candidates for LIU scholarships or grants, Federal grant and loan programs, work-study opportunities, and New York State awards are required to complete the Free Application for Federal Student Aid (FAFSA) each year. The FAFSA should be completed online at [www.fafsa.ed.gov](http://www.fafsa.ed.gov). The federal school code for the LIU Brooklyn campus is **002751**. Continuing students at LIU must reapply for financial assistance each year. Applicants for financial aid may expect to be notified of the decision reached by the Office of Integrated Student Financial Services shortly after their files have been completed. No action will be taken until the candidate has been accepted by the Office of Admissions.

### Awards

#### LIU Scholarships and Awards

The LIU Brooklyn campus awards in University scholarship assistance to students will be \$47 million for the 2012-2013 year. These scholarships and grants, which do not require repayment, are based on academic success, athletic ability, community service, artistic talent, and financial need. The campus also offers honors and departmental scholarships for specific programs of study. A detailed listing of graduate scholarships can be found online at [www.liu.edu/brooklyn/scholarships](http://www.liu.edu/brooklyn/scholarships).

In addition to University financial assistance, LIU Pharmacy provides additional aid in the form of scholarships funded through the generosity of alumni and friends. Awards are based on academic achievement and professional promise, as well as financial need. Interested students should submit a Pharmacy Scholarship Application prior to the start of each Fall semester for consideration. Additional information on these scholarships, including how to apply, can be found online at [www.liu.edu/pharmacy/scholarships](http://www.liu.edu/pharmacy/scholarships).

#### Federal Loan Programs

The Federal government awards financial assistance to students who demonstrate financial need according to a variety of economic criteria as determined by the United States Department of Education. The criteria include an individual and/or parents' income and assets, family's household size, and the number of family members attending college. Benefits from all federal programs are subject to legislative changes. Recipients of federal programs must be U.S.

citizens or permanent residents.

The New York State Higher Education Services Corporation (HESC) offers a variety of grants, scholarships, student loans and parent loans for part-time and full-time graduate study. Although students apply for financial aid directly to HESC, the funds are taken into account when developing the LIU financial aid package. You must be a U.S. citizen and resident of the State of New York to be eligible for HESC awards. Residents of New York State must also apply through the Higher Education Service Corporation at [www.hesc.com](http://www.hesc.com) using the LIU Brooklyn campus school code **5403**. Students who reside outside of New York State may be eligible for grants, scholarships and loans from their home state. Contact the Federal student aid agency at 1-800-433-3243 or [www.federalstudentaid.ed.gov](http://www.federalstudentaid.ed.gov) for more information.

A detailed listing of Federal and State programs, including Direct Loans, can be found online at [www.liu.edu/brooklyn/finaid/grants](http://www.liu.edu/brooklyn/finaid/grants).

#### Veteran Benefits

The LIU Brooklyn campus has a proud and distinguished history of serving its nation's military veterans and active duty service members. Our supportive community of staff and faculty is dedicated to seeing veterans succeed in their education, career and life. To accomplish this mission, LIU Brooklyn provides the resources needed to pursue educational opportunities while balancing the demands of life both inside and outside the classroom.

With the Post-9/11 GI Bill, education-related benefits, including funds for tuition, housing, books and supplies, are better than ever for our veterans. In addition, financial aid, scholarships and New York State tuition awards and grants may also be available to help you with costs that are not covered by your veteran benefits. Additional information can be found online at [www.liu.edu/Brooklyn/StudentLife/Veterans](http://www.liu.edu/Brooklyn/StudentLife/Veterans).

#### Alternative Loan Program

If you find that you need funding beyond the limits of the Federal Direct Student Loan Program, you may wish to consider an Alternative Loan. These loans are not guaranteed by the Federal government and are considered private loans. We urge all students and parents to research any lender they are considering for this type of funding and to specifically ask a number of key questions, including:

- current interest rates
- co-signer requirements
- repayment options, both in school and out
- whether or not the loan may be sold to another provider

The University does not have a preferred lender for alternative loans; each student has the right to select the educational loan provider of his or her choice. However, there are a number of independent resources that can be used to evaluate and analyze alternative loan options, including

[studentlendinganalytics.com/alternative\\_loan\\_options.html](http://studentlendinganalytics.com/alternative_loan_options.html).

If you have considered applying for an alternative loan, you may be required to complete the Free Application for Federal Student Aid at [www.fafsa.ed.gov](http://www.fafsa.ed.gov) in order for the University to certify your loan eligibility. Alternative loans that are used to cover prior semesters may require additional information for approval, such as letters certifying indebtedness, attendance verification, official transcripts, etc. As such, when requesting funding for prior terms, be sure to reference the correct academic year on your application.

The basic process involved with securing alternative loans is the electronic filing of an application, institutional certification, and approval information. Generally speaking, electronic filing processing requires at least 72 hours before a lender will respond. The University will assist you in this process and will determine for you the maximum loan amount you will be allowed to borrow based on your estimated cost of attendance and pre-existing financial aid awards. The complete process normally takes 7-14 business days.

### Terms and Conditions

Awards are not finalized until all requested supporting documentation has been properly submitted and reviewed. All awards are subject to funding levels and appropriations by Federal and State agencies. Many aid programs require that you be matriculated and attend the LIU Brooklyn campus on at least a half-time basis. LIU reserves the right to adjust or cancel offers of financial assistance if you make changes to your FAFSA, adjust your registration status, withdraw from one or more courses, or fail to maintain good academic standing for financial aid purposes. LIU also reserves the right to change the selection criteria, deadlines, and awarding process of academic awards.

Awards, grants, and scholarships listed are for graduate study only and do not apply to undergraduate or professional studies. Students enrolled in accelerated and dual degree programs are advised to contact the Undergraduate Admissions office to obtain information on aid for the undergraduate portion of their degree.

All awards from the LIU Brooklyn campus are accompanied by a letter of stipulation detailing the terms of the award. Students are governed by the stipulations accompanying their specific awards. Part-time status, for the purpose of scholarship and grant renewal, is defined as carrying and earning a minimum of 6 credits per semester.

Unless otherwise indicated, University assistance is for tuition charges only. Students are advised to inform LIU of any aid received from outside sources, and awards from LIU may be adjusted if such additional assistance is in excess of estimated need.

## Standards for Satisfactory Academic Progress

### Federal Financial Aid Programs

Federal regulations require students to make satisfactory academic progress (SAP) toward the completion of a degree or Title IV eligible advanced certificate program in order to receive Title IV financial aid through the Federal Direct Loan Program. Satisfactory academic progress is measured qualitatively and quantitatively by two components: a student's cumulative grade point average (G.P.A.) and the amount of credits they have earned relative to their year in school and enrollment status.

Satisfactory academic progress is measured annually, at the end of the Spring semester, after all grades have been submitted. Students failing to meet the criteria stated below are eligible to appeal this decision if extenuating circumstances played a factor in their academic performance. Examples of such circumstances could include an illness, accident, separation or divorce, or the death of a relative. An appeal must be made in writing to the University and include an explanation of the circumstance(s) that may have adversely affected the student's ability to meet the academic requirements, and the plan or changes that have occurred which will allow them to make SAP in the future. All appeals must be accompanied by supporting documentation, such as a letter from a doctor or attorney. If an appeal is granted, the student will either be placed on probationary status for one semester during which the student must meet SAP guidelines, or must successfully adhere to an individualized academic plan that was developed for them by their academic advisor as part of their appeal. Failure to meet these criteria will result in loss of eligibility for Title IV funds.

Students wishing to receive Title IV financial aid for Summer semesters may have these awards evaluated and offered prior to a determination of SAP. All students receiving summer aid will have their SAP evaluated after all spring grades have been submitted. Students not making progress will have their summer aid cancelled, and the student will be liable for all tuition and fee charges incurred unless an appeal is filed and granted as outlined above.

The criteria below outline the progress that is required for a full time graduate student to be considered in good standing:

**Completion Rate Requirements:** All students must earn at least 67% of their attempted hours. The maximum time frame to complete each degree varies by Department and is outlined herein under the specific degree program.

- **G.P.A. Requirements:** Students who have earned fewer than 13 credits must maintain a 2.5 G.P.A.; students who have earned 13 credits or more must maintain a 3.0 G.P.A.

### Notes:

- Progress standards for part-time students are prorated based upon the criteria above.
- Qualifying transfer credits are counted as both attempted and earned credits but have no effect on the G.P.A.
- Grades of W (Withdrawal), UW (Unofficial Withdrawal), INC (Incomplete), ABS (Absent) and IF (Incomplete Fail) are counted as credits attempted but not completed, and do not affect the G.P.A.
- Repeated classes will count only once towards credits completed. A student may receive aid for a repeated class that has been successfully completed once.
- Any departmental requirements that exceed these standards must be adhered to for the purposes of evaluating SAP.

### New York State Awards

Graduate students receiving New York State Scholarship Awards must meet the academic standing requirements established by the New York State Education Department. These requirements are different from those set forth by the Federal government, and apply only to New York State awards.

The basic measures for good academic standing for New York State Awards include the following:

- **Pursuit of Program:** A student must receive a passing or failing grade (A-F) in a certain percentage of courses each term.
- **Satisfactory Academic Progress:** A student must accumulate a specified number of credits and achieve a specified cumulative grade point average (G.P.A.).

The requirements for meeting these standards increase as the student progresses, and are based upon the number of State awards that the student has already received. Students failing to meet the required criteria are eligible to request a one-time waiver if extenuating circumstances played a factor in their academic performance. Examples of such circumstances could include an illness, accident, separation or divorce, or the death of a relative. An appeal must be made in writing to the University and include an explanation of the circumstance(s) that may have adversely affected the student's ability to meet the academic requirements, and the plan or changes that have occurred which will allow them to make SAP in the future. All appeals must be accompanied by supporting documentation, such as a letter from a doctor or attorney. If a waiver is granted, the student will be eligible for the State award for the semester for which they were granted the waiver. The student must continue to meet the academic progress and pursuit of program requirements to receive further awards.

The chart below outlines the progress that is required for a graduate student to be considered in good standing:

### Graduate Semester Based Program Chart

Semester	A student must have accrued at least this many credits	With at least this G.P.A.
1st	0	0
2nd	6	2.0
3rd	12	2.5
4th	21	2.75
5th	30	3.0
6th	45	3.0
7th	60	3.0
8th	75	3.0

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## BLENDDED AND ONLINE LEARNING PROGRAMS AT LIU

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Technology-enhanced, blended and online learning are an important part of fulfilling LIU's mission of access and excellence in higher education. These courses and programs are delivered through the University's Blackboard Learning Management System, which enables students to complete their online coursework at any time of day and at any place in the world there is an Internet connection. LIU's blended learning programs feature both face-to-face and online components, reducing the amount of time students need to be physically present on campus, while still reaping the benefits of meeting in person with professors, fellow students, and other professionals.

The University currently offers the following degree and certificate programs in the blended or online learning format:

### **LIU Brooklyn**

Advanced Certificate, Educational Leadership  
 B.S. Nursing (R.N. to B.S. track)  
 M.S. Adult Nurse Practitioner  
 M.S. Computer Science  
 M.S. Family Nurse Practitioner  
 M.S. and Advanced Certificate, Human Resource Management  
 M.S. Nurse Educator

### **LIU Post**

Advanced Certificate, Archives & Records Management\*  
 Advanced Certificate, Mobile GIS Applications Development\*  
 Certificate, Health Information Management\*  
 M.S. Accountancy  
 M.S. Adolescence Education (Pedagogy Only)  
 M.S. Corporate Learning and Development  
 M.S. Educational Technology  
 M.S. Environmental Sustainability  
 M.S. Library & Information Science/School Library Media  
 M.S. and Advanced Certificate, Nursing Education  
 M.S. Taxation  
 M.A. TESOL  
 B.S. Degree Completion Program for Adults

### **LIU Hudson**

Advanced Certificate, Bilingual Extension\*  
 Advanced Certificate, Bilingual Special Education\*  
 Advanced Certificate, Cyber Security for Business Professionals\*  
 Advanced Certificate, TESOL: Special Education\*

### **LIU Riverhead**

M.S. and Advanced Certificate, Homeland Security Management\*  
 Advanced Certificate, Cyber Security Policy\*

Our programs are accredited by the Middle States Commission on Higher Education and are registered with the New York State Education Department. For additional program information, please consult the appropriate academic department pages of the campus bulletin.

*\*Denotes a fully online program.*

**APPROVED PROGRAMS - LIU BROOKLYN**

**New York State Education Department Inventory of Registered Programs**

Enrollment in other than registered or otherwise approved programs may jeopardize a student's eligibility for certain student aid awards.

**Richard L. Conolly College of Liberal Arts and Sciences**

Major	Hegis Code	Degree
Biology	0401	BS, MS
Biochemistry	0414	BS
Chemistry	1905	BS, MS
Communication Sciences and Disorders	1220	BS
Communication Sciences and Disorders / Speech-Language Pathology	1220	BS/MS
Speech-Language Pathology (Bilingual Extension)	1220	MS
Computer Art	1009	BFA
Creative Writing	1507	MFA
Cytotechnology	1223	BS
Dance	1008	BFA, BS
Economics	2204	BA
English	1501	BA, MA
History	2205	BA
Humanities	5649	AA
Humanities	4903	BA
Interdisciplinary Major	4901	BA, BS
Journalism	0602	BA
Mathematics	1701	BS
Media Arts	0601	BA
Media Arts	1009	MA
Media Arts	0605	MFA
Medical Technology	1223	BS
Music – Applied Music	1004	BA
Music (Jazz Studies)	1004	BFA
Music Education in Urban Schools	0832	BS
Modern Languages – French, Spanish	1101	BA
Nuclear Medicine Technology	1299	BS
Philosophy	1509	BA
Political Science	2207	BA, MA

Psychology	2001	BA, MA
Clinical Psychology	2003	Ph.D.
Sociology-Anthropology	2208	BA
Speech	1506	BA
Studio Art	1002	BFA
Visual Arts	1099	BA
Teacher of Visual Arts in Urban Schools	0831	BFA
Social Science	2201	MS
Social Science	4903	BA, BS
Social Science	5622	AA
United Nations	2210	Adv. Crt.
Urban Studies	2214	MA
Writing & Producing for Television	0605	MFA

**School of Business, Public Administration and Information Sciences**

Major	Hegis Code	Degree
Accounting	0502	BS, BS/MS, MS, MBA
Business Administration	5004	AAS
Business Administration	0506	MBA
Business Finance	0504	BS
Business Management	0506	BS
Computer Science	0701	BS, MS
Entrepreneurship	0501	BS
Gerontology	2104	Adv. Crt.
Human Resources Management	0515	MS, Adv. Crt.
Health Administration	1202	MPA
Marketing	0509	BS
Not-for-Profit Management	2102	Adv. Crt.
Public Administration	2102	MPA
Taxation	0502.1	MS
Technology Management	0507	BS
United Nations / Public Administration	2210 / 2102	Adv. Crt/MPA

**School of Education**

Major	Hegis Code	Degree
Adolescence Urban Education: Biology	0401	BS
Adolescence Urban Education: Biology 7-12: 1st Initial	0401.01	MSEd
Adolescence Urban Education: Biology 7-12: 2nd Initial	0401.01	MSEd
Adolescence Urban Education: Biology 7-12: Non-certification	0401.01	MSEd
Adolescence Urban Education: Chemistry	1905.01	BS
Adolescence Urban Education: Chemistry 7-12: 1st Initial	1905.01	MSEd
Adolescence Urban Education: Chemistry 7-12: 2nd Initial	1905.01	MSEd
Adolescence Urban Education: Chemistry 7-12: Non-certification	1905.01	MSEd
Adolescence Urban Education: English	1501.01	BA
Adolescence Urban Education: English 7-12: 1st Initial	1501.01	MSEd
Adolescence Urban Education: English 7-12: 2nd Initial	1501.01	MSEd
Adolescence Urban Education: English 7-12: Non-certification	1501.01	MSEd
Adolescence Urban Education: Mathematics	1701.01	BS
Adolescence Urban Education: Math 7-12: 1st Initial	1701.01	MSEd
Adolescence Urban Education: Math 7-12: 2nd Initial	1701.01	MSEd
Adolescence Urban Education: Math 7-12: Non-certification	1701.01	MSEd
Adolescence Urban Education: Social Studies	2201.01	BA
Adolescence Urban Education: Social Studies 7-12: 1st Initial	2201.01	MSEd

Adolescence Urban Education: Social Studies 7-12: 2nd Initial	2201.01	MSEd
Adolescence Urban Education: Social Studies 7-12: Non-certification	2201.01	MSEd
Adolescence Urban Education: Spanish	1105.01	BA
Middle Childhood & Adolescence Urban Ed: Biology	0401.01	BS
Middle Childhood & Adolescence Urban Ed: Chemistry	1905.01	BS
Middle Childhood & Adolescence Urban Ed: English	1501.01	BA
Middle Childhood & Adolescence Urban Ed: Mathematics	1701	BS
Middle Childhood & Adolescence Urban Ed: Social Studies	2201.01	BS
Childhood Urban Education	0802	BS
Childhood Urban Education: 1st Initial	00802	MSEd
Childhood Urban Education: 2nd Initial	0802	MSEd
Childhood Urban Education: Non-certification	0802	MSEd
Childhood/Early Childhood Urban Education: 1st Initial	0802	MSEd
Childhood/Early Childhood Urban Education: 2nd Initial	0802	MSEd
Childhood/Early Childhood Urban Education: Non-certification	0802	MSEd
Early Childhood Urban Education: 1st Initial, 2nd Initial	0802.00	MSEd
Early Childhood Urban Education: Non-certification	0802.00	MSEd
Early Childhood Urban Education	0823	Adv. Cr.
Teacher of Physical Education in Urban Schools	0835	BS

Teacher of Visual Arts in Urban Schools	0831	BFA
Music Education in Urban Schools	0832	BS
Teaching Urban Adolescents with Disabilities: 1st Initial	0808	MSEd
Teaching Urban Adolescents with Disabilities: 2nd Initial	0808	MSEd
Teaching Urban Adolescents with Disabilities: Non-certification	0808	MSEd
Teaching Urban Children with Disabilities: 1st Initial	0808	MSEd
Teaching Urban Children with Disabilities: 2nd Initial	0808	MSEd
Teaching Urban Children with Disabilities: Non-certification	0808	MSEd
TESOL: 1st Initial	1508	MSEd
TESOL: 2nd Initial	1508	MSEd
TESOL: Non-certification	1508	MSEd
Bilingual Education	0899	Adv. Crt.
School Counselor	0826.01	MSEd
School Counselor	0826	Adv.Crt.
Bilingual School Counselor	0826.01	MSEd
Bilingual School Counseling	0899	Adv. Crt.
Mental Health Counseling	2104.1	MS, Adv. Crt.
School Psychologist	0826.02	MSEd
Educational Leadership	0828	Adv. Crt.

**School of Health Professions**

Major	Hegis Code	Degree
Athletic Training	1299.3	BS/MS
Diagnostic Medical Sonography	1225	BS
Exercise Science	1201	MS
Health Sciences	1201	BS
Health Sciences / Public Health	1201 / 1214	BS/MPH
Occupational Therapy	1208	BS/MS

Physical Therapy	1212	DPT
Physician Assistant Studies	1299.1	MS
Public Health	1214	MPH
Respiratory Care	1299	BS
Sports Science	1299.3	BS
Social Work	2104	BA, MSW

**School of Nursing**

Major	Hegis Code	Degree
Nursing	1203	BS
Adult Nurse Practitioner	1203.1	BS/MS, MS
Adult Nurse Practitioner	1203.12	Adv. Crt.
Family Nurse Practitioner	1203.1	MS
Family Nurse Practitioner	1203.12	Adv. Crt.
Executive Program for Nursing and Health Care Management	1203.1	BS/MS, MS
Nurse Educator	1203.1	MS
Education for Nurses	1203.12	Adv. Crt.

**LIU Pharmacy**

Major	Hegis Code	Degree
Pharmacology/ Toxicology	0409	MS
Pharmaceutics	1211	MS, Ph.D.
Drug Regulatory Affairs	1211	MS
Pharmacy	1211	PharmD

**LIU Global**

Major	Hegis Code	Degree
Global Studies	2210	BA

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**LIU PHARMACY FACULTY**


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