THE SCHOOL OF PHARMACY
PROGRAMS/DEGREES AVAILABLE:
• Bachelor of Science (B.S.) in Pharmacy
• Doctor of Pharmacy (Pharm.D.)

The B.S. in Pharmacy program extends over five academic years including two years of pre-pharmacy and three professional years (P1, P2, and P3) of pharmacy education. After receiving the B.S. in Pharmacy, a student may apply for admission into the fourth professional year (P4) leading to the Pharm.D. degree. Successful completion of the B.S. in Pharmacy program qualifies graduating students to sit for the National Competency Assessment Examination (Colloquium) in Lebanon.

The Pharm.D. program extends over six academic years, including the five years leading to the B.S. in Pharmacy. Successful completion of the Pharm.D. program qualifies graduating students to sit for the North American Pharmacy Licensure Examination (NAPLEX) in the United States.

MISSION
The School’s primary responsibility is to graduate pharmacists who are entrusted with the highest academic standards to apply and disseminate the most updated information about drugs in the various and ever changing health care systems. Graduates will be competent to practice pharmacy in all settings and be equipped with the necessary values to serve society in a most caring, professional, and ethical conduct.

PROGRAM EDUCATIONAL GOALS
The goal of the program is to prepare pharmacy graduates to:
1. Provide evidence-based patient centered care to optimize pharmacotherapy outcomes in various multidisciplinary health-care practice settings;
2. Manage pharmacy operations in hospitals, community pharmacies, and industrial settings;
3. Promote public health awareness and disease prevention through innovation in the practice of pharmacy, for the benefit of the individual and the community being served;
4. Perform duties in accordance with legal, ethical, socio-economic and professional standards;
5. Integrate scholarly research with clinical pharmacy practice and commit to self-directed lifelong learning.

ACCREDITATION STATUS
The School of Pharmacy is a full member of the American Association of Colleges of Pharmacy (AACP). It is the only full member of AACP outside of the United States.

The professional Doctor of Pharmacy (Pharm.D.) program at the Lebanese American University School of Pharmacy is accredited by the Accreditation Council for Pharmacy Education (ACPE). Currently, it is the only Pharm.D. program outside the United States that is accredited by ACPE. The initial program review by ACPE occurred in the year 2002 when full accreditation was granted.

DEPARTMENTS
The School of Pharmacy comprises two departments: Pharmaceutical Sciences and Pharmacy Practice. The Pharmaceutical Sciences Department provides pharmacy students with the foundation in basic and applied pharmaceutical and biomedical sciences, as well as in social, behavioral and administrative sciences.

Faculty members of the Pharmaceutical Sciences Department have diverse teaching involvement and scholarly interests. These include pharmacology, pharmacokinetics, pharmacogenetics, pharmaceutics, pharmacognosy, pathophysiology, microbiology, molecular medicine, biology, immunology, chemistry, biochemistry, biomedical ethics, behavioral sciences, biostatistics, management, and more. Department Faculty are involved in didactic teaching, scholarly activities and laboratory research, and service to the School, University, profession and community.

The mission of the Pharmaceutical Sciences Department is to educate students
in biomedical, pharmaceutical, social, behavioral and administrative sciences. The department is committed to promote research excellence and provide meaningful contributions to the profession and community.

Members of the Pharmaceutical Sciences Department will accomplish the department’s mission through the following activities:

1. Foster professional development in students by promoting critical thinking and life-long learning;
2. Conduct basic and translational interdisciplinary research in pharmaceutical sciences;
3. Encourage faculty, staff and students to participate in community service and professional development activities;
4. Maintain a collegial environment to support faculty and staff retention and development.

The Pharmacy Practice Department provides pharmacy students with a comprehensive foundation of clinical sciences and experiential education, and reinforces students’ knowledge of social, behavioral and administrative sciences and their application to contemporary pharmacy practice.

Clinical faculty members of the Pharmacy Practice Department have diverse practice and scholarly interests. These include infectious disease, hematology/oncology, nephrology, neurology, ambulatory care, endocrinology, drug information, critical care, cardiology, endocrinology, nutrition support, internal medicine, pharmacoconomics, medication safety, and more.

Department faculty are involved in providing the didactic teaching of pharmacotherapeutics; experiential education of pharmacy students; scholarly activities related to their areas of interest and specialty; patient care; and service to the School, University, profession and community. Faculty members are also involved in developing and implementing innovative practice models that are in line with emerging healthcare and health-systems needs.

The mission of the Pharmacy Practice Department is to prepare and model for the next generation of pharmacy professionals by fostering a perpetual commitment to excellence in education, health care and clinical research.

Members of the Pharmacy Practice Department will provide exemplary professional service through the following activities:

1. Prepare students for entry into the pharmacy profession in an environment that promotes critical thinking, life-long learning, leadership and professionalism;
2. Recruit, retain and promote competent Clinical faculty in diverse areas of clinical specialties;
3. Pioneer the role of interdisciplinary practice through commitment to serving patients and promoting quality public health;
4. Contribute to the pharmacy and healthcare literature by conducting and publishing clinical research.
DEAN
Pierre Zalloua, Ph.D.

ASSOCIATE DEAN FOR ACADEMIC AFFAIRS
Imad Btaiche, Pharm.D., BCNSP

ACTING ASSISTANT DEAN FOR STUDENTS AFFAIRS
Jad Abdallah, Ph.D.

CHAIRS
Roy Kanbar, D.Pharm. Ph.D., Pharmaceutical Sciences
Aline Saad, Pharm.D., Pharmacy Practice
Lamis Karaoui Pharm.D., BCPS, Director of Experiential Education

FACULTY
FULL-TIME FACULTY
J. Abdallah, Ph.D.
T. Abouantoun, Ph.D.
I. Btaiche, Pharm.D., BCNSP
N. Chamoun, Pharm.D., BCPS**
S. Chamoun-Nasser, Pharm.D.
H. Dimassi, Ph.D.
W. Kabbara, Pharm.D.
R. Kanbar, Pharm.D., Ph.D.
L. Karaoui, Pharm.D., BCPS
K. Khoudry, Pharm.D.
H. Mansour, Pharm.D., BCPS
A. Milane, D.Pharm., Ph.D.
M. Mroueh, Ph.D.
W. Ramadan, Pharm.D.
E. Ramia, Pharm.D.
H. Rizk, M.D.*
Y. Saab, Pharm.D., Ph.D.
A. Saad, Pharm.D.
M. Sheikh-Taha, Pharm.D., BCPS
P. Zalloua, Ph.D.
A. Zeitoun, Pharm.D.
R. Zeenny, Pharm.D.

*50% SOP + 50% SAS
**50% SOP + 50% at UMC–RH

PART-TIME FACULTY
F. Abillama, M.D.
B. Chami, Pharm.D.
M. Dunia, M.D.
M. El Beyrouthy, Ph.D.
R. Fahd, M.S.
M. Ghassibe, Ph.D.
L. Haddad, Ph.D.
M. Jabre, Pharm.D., BCPP
B. Khodor, M.D.
V. Loubnan, Pharm.D.
Z. Nassour, D.Pharm., R.Ph.
Y. Saab, Ph.D.
S. Shelh, R.Ph.
R. Takchi, M.Sc.
Z. Tannous, M.D.
S. Tokajian, Ph.D.

LEBANON-BASED ADJUNCT FACULTY
W. Abi Ghanem, R.Ph.
C. Abighosn, R.Ph.
C. Abi Khalid, R.Ph.
R. Abi Khalil, R.Ph.
C. Abou Jaoude, R.Ph.
R. Abou Jaoude, R.Ph.
S. Addada, R.Ph.
I. Adaimy, R.Ph.
M. Ahdab, R.Ph.
A. Alameddine, R.Ph.
M. Alameh, R.Ph.
A. Ali, R.Ph.
F. Antaki, R.Ph.
C. Asmar, R.Ph.
R. Azzam, R.Ph.
M. Bawab, R.Ph.
C. Barbar, R.Ph.
R. Batrouni, R.Ph.
T. Beani, R.Ph.
R. Bitar, R.Ph.
R. Chaarani, R.Ph.
N. Chidiac, R.Ph.
Z. Damerji, R.Ph.
L. Draiby R.Ph.
N. Drouby, R.Ph.
T. Farah, R.Ph.
J. Ghosoub, R.Ph.
S. Helou, R.Ph., Pharm.D.
B. Hindi, R.Ph.
R. Hokayem, R.Ph.
S. Itani, R.Ph., Pharm.D.
H. Jardaly, R.Ph.
L. Kara, R.Ph., Pharm.D.
F. Kehde, R.Ph.
K. Kevorkian, R.Ph.
K. Khawand, R.Ph.
G. Khayat, R.Ph., Pharm.D.
C. Kaprianos, R.Ph., Pharm.D.
A. Kordahi, R.Ph.
A. Kouyoumji, R.Ph.
C. Kreidy, R.Ph.
M. Machmouchi, R.Ph.
F. Mahfouz, R.Ph.
R. Mansour, R.Ph.
F. Maroun, R.Ph.
I. Mokdad, R.Ph.
N. Mouawad, R.Ph.
Y. Najjarin, R.Ph.
Z. Nassour, R.Ph.
E. Nehme, R.Ph.
N. Nehme, R.Ph.
S. Obeid, R.Ph.
S. Rahbani, R.Ph.
Y. Saad, R.Ph.
J. Sakr, R.Ph.
R. Sakr, R.Ph.
S. Sammak, R.Ph.
U. Shanouha, R.Ph.
S. Shelh, R.Ph.
S. Shaheen, R.Ph.
G. Sili, R.Ph., Pharm.D.
L. Skayem, R.Ph., Pharm.D.
O. Tabboush, R.Ph.
BACHELOR OF SCIENCE (B.S.) IN PHARMACY

ADMISSION

The professional program requires successful completion of pre-pharmacy studies. Applicants transferring from an outside academic institution must have a minimum letter grade B or its equivalent on any of the major pre-pharmacy courses (see below) or their LAU course equivalents, for them to be eligible for applying to the Professional Year 1. All applicants must complete an application form that can be obtained from the office of Student Affairs at the School of Pharmacy. The application deadline is May 15 with all required documents included. Incomplete or late applications will not be processed.

To be eligible for admission to the professional program, applicants must fulfill all of the following conditions in pre-pharmacy:

1. Completed all pre-pharmacy courses with a minimum cumulative GPA of 2.5;
2. Passed all major courses with a minimum letter grade C on any course. Major courses include all PHAcourses as well as BIO201, CHM201, CHM311, CHM312, CHM313, and CHM314. For the non-major courses, D is considered a passing letter grade;
3. Did not exceed three course repeats, whether these repeats were of the same course or different courses. Note that a course withdrawal noted WF is counted as repeat;
4. Did not receive more than one official academic warning;
5. For transfer students, only courses listed in the pre-pharmacy curriculum, either transferred from an outside academic institution or LAU, will be taken into consideration in the calculation of the GPA and the number of repeats;

Evaluation criteria for admission into the professional program are based on:

1. The cumulative GPA as well as the GPA related to major courses;
2. The performance on an interview conducted during the admissions process;
3. A cumulative internal evaluation by all school faculty who were directly
involved in teaching the applicant;
4. Three recommendation letters (attached to the application);
5. An assessment of the applicant’s writing skills based on his/her performance in a short essay;
6. Number of repeated courses (R), withdrawals (WF), and failed courses (F);
7. Number of official academic warnings.

The School Admissions Committee reviews the applications and conducts student interviews at the end of the spring semester of the preceding academic year.

Admission to the professional pharmacy program takes place in the fall semester of the following academic year. The Professional Year 1 has a capacity to accommodate a maximum of 75 students each year.

A student who meets the admissions criteria may carry over one course from the pre-pharmacy program to the professional program, upon the approval of the School Academic Council. This exception does not apply to courses from which a student has withdrawn or scored a final letter grade F. Moreover, a student seeking this exception must provide proof that he/she was unable to repeat the course prior to the start of Professional Year 1. A student must pass the said course with a minimum letter grade C within the following academic year, otherwise he/she will not be promoted to the next academic year.

The Lebanese American University is an equal opportunity institution and does not consider the race, sex, religion or national origin of an applicant as a criterion for admission into the program.

ACADEMIC PROBATION & DISMISSAL FROM THE PROFESSIONAL PROGRAM

A student can register in a course up to three times, including withdrawals. A student is dismissed from the school if he/she fails to score at least a letter grade C in the same PHA course after three attempts.

A student is placed on probation if his/her cumulative GPA is below 2.00 at the end of a semester for all courses taken at LAU during that semester, irrespective of incomplete grades or withdrawals.

A student on probation may not carry more than 13 credits in a regular semester and is advised to repeat as soon as possible the courses with a letter grade F or D.

A student who does not come off academic probation within two consecutive semesters of enrollment at LAU (summer modules excluded) will be suspended regardless of any incompletes and semester withdrawals.

A student suspended after academic probations must submit a petition to the Registrar’s Office. Readmission into LAU is not guaranteed and each case is carefully reviewed for its own merit.

A student readmitted after suspension will be placed on probation and given two semesters excluding summers to remove the probation. Failure to remove the probation will lead to the student’s dismissal from the university.

PROMOTION TO A HIGHER YEAR

A student must pass all professional program courses with a minimum letter grade C in order to advance to the next professional year.

A student may carry over to the next professional year only one course with a letter grade D, D+ or C- after securing the approval of the School Academic Council. Courses from which students have withdrawn or scored a letter grade F may not be carried over. A carried over course must be completed with a minimum letter grade C within the next academic year or summer semester in order to be promoted to the next professional year.

A student must successfully complete all Professional Years 1 and 2 didactic courses of the program prior to enrolling in the Professional Year 3 Pharmacy Practice Experiences (PHA570, PHA571, and PHA572).

GRADUATION REQUIREMENTS

To earn a Bachelor of Science in Pharmacy, a student must have a minimum overall GPA of 2.00 in all PHA courses taken at LAU, and have a minimum grade of C in all PHA courses.
DOCTOR OF PHARMACY (PHARM.D.)

The Pharm.D. program extends over four professional years in addition to the two pre-pharmacy years.

ADMISSION

Applicants into the Professional Year 4 (P4) leading to the Pharm.D. degree must apply within two years of completing Professional Year 3 (P3) in any ACPE-accredited program. They must complete an application form for admission into the P4 year.

The application forms are obtained from the Student Affairs Office at the school and must be submitted with all required documents before December 15. Incomplete applications and any application received after the deadline will not be processed.

To be eligible for applying to admission into the P4 year, students must fulfill all of the following conditions during their professional pharmacy years:

1. Completed all professional pharmacy courses with a minimum cumulative GPA of 2.5.
2. Passed all courses of the professional pharmacy program with a minimum letter grade C on any course.
3. Did not exceed three course repeats, whether these repeats were of the same course or different courses (note: a course withdrawal noted WF is counted as repeat).
4. Did not receive more than one official academic warning.

Evaluation criteria for admission into the professional program are based on:

1. The GPA related to the professional pharmacy program courses;
2. The performance on an interview conducted during the admissions process;
3. A cumulative internal evaluation by school faculty who were directly involved in teaching the applicant;
4. Three recommendation letters (attached to the application);
5. Number of repeated courses (R), withdrawal (WF), and failed courses (F);
6. Number of official academic warnings.

The School Admissions Committee reviews the applications and conducts interviews at the end of fall semester of the P3 year. Student acceptance into the P4 year remains pending until successful completion of all P3 courses. A student may not carry any course from the pharmacy professional program to the P4 year. Admission to the P4 year takes place in the fall semester of the academic year. The P4 year has a capacity to accommodate 25 to 30 students each academic year.

Students admitted into the Pharm.D. program are subject to the requirement stated in the ACPE Standard 14, Guideline 14.6, namely “the required Advanced Pharmacy Practice Experiences in all program pathways must be conducted in the United States or its territories or possessions.”

GRADUATION REQUIREMENTS

To graduate with a Pharm.D. degree, a student must have a minimum GPA of 2.00 and grades of C or higher in all required courses.
**STUDY PLAN**

The curriculum below applies only to students who entered LAU in the fall 2007 semester. Students who joined the School of Pharmacy prior to the fall 2007 semester are advised to refer to the 2005 Academic Catalog available on the LAU website.

### PRE-PROFESSIONAL YEAR I

#### Fall Semester (17 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARA—</td>
<td>Appreciation of Arabic Literature</td>
<td>3</td>
</tr>
<tr>
<td>BIO201</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>CHM201</td>
<td>Chemical Principles</td>
<td>3</td>
</tr>
<tr>
<td>PED—</td>
<td>Physical Education</td>
<td>1</td>
</tr>
<tr>
<td>——</td>
<td>LAC–Arts</td>
<td>3</td>
</tr>
<tr>
<td>——</td>
<td>LAC–Social Sciences</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Spring Semester (16 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CHM311</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHM313</td>
<td>Organic Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>ENG202</td>
<td>Sophomore Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td>PHA202</td>
<td>Medical Anatomy &amp; Physiology</td>
<td>4</td>
</tr>
<tr>
<td>PHA204</td>
<td>Computer Application to Pharmacy</td>
<td>2</td>
</tr>
<tr>
<td>——</td>
<td>LAC–Literature</td>
<td>3</td>
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### PRE-PROFESSIONAL YEAR II

#### Fall Semester (14 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>CHM312</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHM314</td>
<td>Organic Chemistry II Lab</td>
<td>1</td>
</tr>
<tr>
<td>ENG203</td>
<td>Fundamentals of Oral Communication</td>
<td>3</td>
</tr>
<tr>
<td>PHA209</td>
<td>Principles of Pathophysiology &amp; Immunology</td>
<td>4</td>
</tr>
<tr>
<td>PHA211</td>
<td>Microbiological Basis of Disease</td>
<td>3</td>
</tr>
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### PROFESSIONAL YEAR I

#### Fall Semester (18 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHA308</td>
<td>Pharmaceutical Analysis &amp; Biotechnology</td>
<td>2</td>
</tr>
<tr>
<td>PHA309</td>
<td>Pharmaceutical Analysis &amp; Biotechnology Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHA312</td>
<td>Medicinal Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PHA314</td>
<td>Dosage Forms I</td>
<td>3</td>
</tr>
<tr>
<td>PHA315</td>
<td>Dosage Forms I Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHA320</td>
<td>Physical Assessment</td>
<td>2</td>
</tr>
<tr>
<td>PHA322</td>
<td>Professional Communication</td>
<td>1</td>
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<tr>
<td>PHA333</td>
<td>Pharmacy Management</td>
<td>3</td>
</tr>
<tr>
<td>PHA567</td>
<td>Professional Elective</td>
<td>2</td>
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#### Spring Semester (15 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHA313</td>
<td>Medicinal Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>PHA316</td>
<td>Dosage Forms II</td>
<td>3</td>
</tr>
<tr>
<td>PHA317</td>
<td>Dosage Forms II Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHA325</td>
<td>Pharmacy Practice &amp; Ethics</td>
<td>2</td>
</tr>
<tr>
<td>PHA330</td>
<td>Pharmacology I</td>
<td>4</td>
</tr>
<tr>
<td>PHA340</td>
<td>Pharmacotherapeutics I</td>
<td>2</td>
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#### Summer Semester (3 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA398</td>
<td>Pharmacy Practice Management I</td>
<td>3</td>
</tr>
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</table>
### PROFESSIONAL YEAR II

#### Fall Semester (18 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHA421</td>
<td>Drug Information &amp; Literature Evaluation</td>
<td>2</td>
</tr>
<tr>
<td>PHA422</td>
<td>Pharmacokinetics &amp; Biopharmaceutics</td>
<td>4</td>
</tr>
<tr>
<td>PHA430</td>
<td>Pharmacology II</td>
<td>4</td>
</tr>
<tr>
<td>PHA441</td>
<td>Pharmacotherapeutics II</td>
<td>3</td>
</tr>
<tr>
<td>PHA442</td>
<td>Pharmacotherapeutics III</td>
<td>3</td>
</tr>
<tr>
<td>PHA567</td>
<td>Professional Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Spring Semester (17 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHA435</td>
<td>Pharmacognosy &amp; Evidence-Based Herbal Medicine</td>
<td>2</td>
</tr>
<tr>
<td>PHA443</td>
<td>Pharmacotherapeutics IV</td>
<td>3</td>
</tr>
<tr>
<td>PHA444</td>
<td>Pharmacotherapeutics V</td>
<td>3</td>
</tr>
<tr>
<td>PHA445</td>
<td>Pharmacotherapeutics VI</td>
<td>3</td>
</tr>
<tr>
<td>PHA449</td>
<td>Dispensing &amp; Pharmaceutical Care</td>
<td>3</td>
</tr>
<tr>
<td>PHA452</td>
<td>Toxicology</td>
<td>3</td>
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#### Summer Semester (3 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA497</td>
<td>Introduction to Professional Pharmacy Practice Experience</td>
<td>1</td>
</tr>
<tr>
<td>PHA499</td>
<td>Pharmacy Practice Management II</td>
<td>2</td>
</tr>
</tbody>
</table>

### PROFESSIONAL YEAR III

#### Fall Semester (19 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA523</td>
<td>Clinical Pharmacokinetics*</td>
<td>1</td>
</tr>
<tr>
<td>PHA523</td>
<td>or PHA567</td>
<td></td>
</tr>
<tr>
<td>PHA550</td>
<td>Introduction to Pharmacogenomics</td>
<td>1</td>
</tr>
<tr>
<td>PHA557</td>
<td>Pharmacoeconomics</td>
<td>3</td>
</tr>
<tr>
<td>PHA560</td>
<td>Clinical Nutrition &amp; Diet Therapy</td>
<td>2</td>
</tr>
<tr>
<td>PHA570</td>
<td>Professional Pharmacy Practice – Hospital/ DIC Experience</td>
<td>6</td>
</tr>
</tbody>
</table>

### PROFESSIONAL YEAR IV

#### Fall Semester (18 credits)

The Professional Year 4 curriculum applies only to Pharm.D. students. The following four required Advanced Pharmacy Practice Experiences (APPEs) are conducted in the United States or its territories or possessions (District of Columbia, Guam, Puerto Rico, and U.S. Virgin Islands):

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA510</td>
<td>U.S. Pharmacy Law &amp; Regulation</td>
<td>2</td>
</tr>
<tr>
<td>PHA513</td>
<td>Lebanese Pharmacy Law &amp; Regulation</td>
<td>1</td>
</tr>
<tr>
<td>PHA515</td>
<td>Pharmacy Seminar</td>
<td>1</td>
</tr>
<tr>
<td>PHA567</td>
<td>Professional Elective</td>
<td>1</td>
</tr>
<tr>
<td>PHA572</td>
<td>Professional Pharmacy Practice – Patient Care Experience</td>
<td>12</td>
</tr>
</tbody>
</table>

*Students interested in applying to Professional Year 4 leading to the Pharm.D. should take PHA523 Clinical Pharmacokinetics (1 cr.) as a professional elective.

#### Spring Semester (17 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA670</td>
<td>Ambulatory Care</td>
<td>3</td>
</tr>
<tr>
<td>PHA671</td>
<td>Community Pharmacy</td>
<td>3</td>
</tr>
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<td>PHA672</td>
<td>Hospital/Health System Pharmacy</td>
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<tr>
<td>PHA673</td>
<td>Inpatient/Acute Care General Medicine</td>
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The five elective experiential education experiences may be chosen from any of the following choices of the course PHA650 Elective Advanced Pharmacy Practice Experiences (APPEs):

- Ambulatory Care
- Adult Oncology

A total of 6 credits of professional electives, as one-credit or two-credit courses, should be completed before graduation.
PHARMACEUTICAL SCIENCES DEPARTMENT

**PHA202 Medical Anatomy and Physiology [4 cr.]**
This course covers the anatomy and physiology of the human body, with emphasis on the central nervous system, the autonomic nervous system, the cardiovascular and renal systems, and the immune, endocrine, gastrointestinal and respiratory systems. A thorough understanding of receptors, their affinity to drugs and hormones, as well as targets for therapeutic interventions will be emphasized. Congenital malformations and their physiological impacts will also be discussed.

*Prerequisites: BIO201.*

*Co-requisites: Pre-Professional Year 1 status.*

**PHA204 Computer Application to Pharmacy [2 cr.]**
This course covers the use of computers for solving professional, educational and business problems. The course also covers the utility of computer technology, online information resources, hardware peripherals, CD-ROM databases, programs, and multimedia computing systems, which pharmacists can use in their practice.

*Co-requisites: Pre-Professional Year 1 status.*

**PHA205 Statistics for Health Profession Majors [3 cr.]**
This course covers the descriptive and basic inferential statistics, and issues surrounding the design of biomedical and biopharmaceutical investigations.

*Co-requisites: Pre-Professional Year 1 status.*

**PHA208 Medical Biochemistry [4 cr.]**
This course covers the chemistry and metabolism of biomolecules (proteins, lipids, carbohydrates and DNA) and enzymology, and metabolic pathways to energy utilization. Particular emphasis is placed on the biochemical basis for disease, and targets for therapeutic intervention.

*Prerequisites: BIO201, CHM201, CHM311, CHM312, CHM313, and CHM314.*

*Co-requisites: Pre-Professional Year 2 status.*
PHA209 Principles of Pathophysiology and Immunology [4 cr.]
This course covers the basic principles and mechanisms of pathologies and disorders that affect the human body in general, as well as a few selected systems. It also covers the environmental, nutritional and genetic origins of pathology and immunity, in relation to internal as well as external disease processes. Diagnostic modalities, interpretation of relevant laboratory data, and an introduction to the basic pharmacology and treatment of major diseases, are also covered.
Prerequisites: PHA202.
Co-requisites: Pre-Professional Year 2 status.

PHA210 Systems Pathophysiology [4 cr.]
This course is a continuation of PHA209. It covers the pathologies and disorders that affect the human body in its various systems. It discusses disease processes, etiologies and symptoms, as well as diagnostic modalities, the interpretation of relevant laboratory data, and an introduction to the basic pharmacology and the treatment of major diseases of the various bodily systems. The course will consist of lectures, discussions, as well as case presentations.
Prerequisites: PHA209.
Co-requisites: Pre-Professional Year 2 status.

PHA211 Microbiological Basis of Disease [3 cr.]
This course covers the characteristics of microorganisms, in general, and the specific characteristics of pathogenic bacteria, viruses and fungi. Topics include the different aspects of medical microbiology, identification and the control of pathogens, disease transmission, host resistance, immunity, control of infection, and development of microbiological techniques.
Prerequisites: BIO201.
Co-requisites: Pre-Professional Year 2 status.

PHA308 Pharmaceutical Analysis and Biotechnology [2 cr.]
This course is an introduction to the principles and techniques used in pharmaceutical analysis, hence; extraction, spectroscopy, chromatography and dissolution procedures. Particular emphasis is placed on the recombinant DNA technology.
Prerequisites: PHA208.
Co-requisites: Professional Year 1 status.

PHA309 Pharmaceutical Analysis and Biotechnology Lab [1 cr.]
This course is a laboratory taken concurrently with PHA308. Techniques used to assess the quality of drug products are covered, as well as PCR and electrophoresis techniques.
Prerequisites: PHA208.
Corequisites: PHA308 and Professional Year 1 status.

PHA312 Medicinal Chemistry I [3 cr.]
This course covers the physicochemical properties of various drug categories, their relation to biological activity, metabolic pathways, and structure-activity, and their adverse effects.
Prerequisites: CHM312 and CHM314.
Co-requisites: Professional Year 1 status.

PHA313 Medicinal Chemistry II [3 cr.]
This course is a continuation of Medicinal Chemistry I.
Prerequisites: PHA312.
Co-requisites: Professional Year 1 status.

PHA314 Dosage Forms I [3 cr.]
This course covers the design, formulation, manufacturing and evaluation of pharmaceutical dosage forms, based on physical chemical principles. Drug regulatory affairs, current good manufacturing practices, in compliance with FDA guidelines and standards, pre-formulation studies, formulations of solids, liquids, and aerosols are discussed.
Corequisites: PHA315 and Professional Year 1 status.

PHA315 Dosage Forms I Laboratory [1 cr.]
This course is a compounding laboratory taken concurrently with PHA314. Techniques and principles used to prepare and dispense individual extemporaneous pre-
scriptions, including calculations and dating of compounded dosage forms, are discussed.

Corequisites: PHA314 and Professional Year 1 status.

PHA316 Dosage Forms II [3 cr.]
This course is a continuation of PHA314. It covers the design, formulation, manufacturing and evaluation of semi-solid, complex and novel pharmaceutical dosage forms.

Prerequisites: PHA314.
Corequisites: PHA317 and Professional Year 1 status.

PHA317 Dosage Forms II Laboratory [1 cr.]
This is a compounding laboratory taken concurrently with PHA316.

Prerequisites: PHA315.
Co-requisites: Professional Year 1 status.

PHA320 Physical Assessment [2 cr.]
This course is an introduction to the various techniques and tools necessary to conduct physical examinations and to monitor modifications caused by common disease states and drug therapy. Practical sessions are included.

Prerequisites: PHA209 and PHA210.
Co-requisites: Professional Year 1 status.

PHA322 Professional Communication [1 cr.]
This course is an analysis and application of the factors promoting or hindering successful communications between the pharmacist and the patients, as well as with health professionals.

Prerequisites: ENG202 and ENG203.
Co-requisites: Professional Year 1 status.

PHA325 Pharmacy Practice and Ethics [2 cr.]
This course is an introduction to the practice of pharmacy in institutional and community settings. It entails the study of the development of the profession of pharmacy and the ethical principles upon which the profession rests.

Co-requisites: Professional Year 1 status.

PHA330 Pharmacology I [4 cr.]
The course is designed to introduce students to the principles of drug use. The course emphasizes on drug–receptor relationships, pharmacodynamics, pharmacokinetics, drug–drug interactions, and the adverse effects of various categories of drugs.

Prerequisites: PHA210 and PHA312.
Co-requisites: PHA313 and Professional Year 1 status.

PHA333 Pharmacy Management [3 cr.]
This course is an introduction to pharmacy management, as applied to various pharmacy practice settings. Topics will be discussed within the framework of the Lebanese law.

Co-requisites: Professional Year 1 status.

PHA421 Drug Information and Literature Evaluation [2 cr.]
This course covers the use of reference sources to retrieve, evaluate and disseminate information in pharmacy practice. Fundamentals of research design, methodology, and analysis in practicing evidence-based pharmacy are discussed.

Prerequisites: PHA205 and PHA330.
Co-requisites: Professional Year 2 status.

PHA422 Pharmacokinetics and Biopharmaceutics [4 cr.]
This course entails the study and application of the fundamental concepts of absorption, distribution, metabolism and the elimination of drugs. The influences of formulation, disease and diet on pharmacokinetics, as well as the principles of bioavailability and bioequivalence are discussed.

Prerequisites: PHA316.
Co-requisites: Professional Year 2 status.

PHA430 Pharmacology II [4 cr.]
This course is a continuation of PHA330.

Prerequisites: PHA210, PHA313, PHA330 and PHA211.
Co-requisites: Professional Year 2 status.
PHA435 Pharmacognosy and Evidence-Based Herbal Medicine [2 cr.]
This course is an introduction to the preparation and extraction of active ingredients, and the identification and classification of medicinal plants. An explanation of the pharmacology and therapeutic use of commonly prescribed and dispensed herbal medicines, based on current scientific research, is covered.
Prerequisites: PHA313.
Co-requisites: Professional Year 2 status.

PHA452 Toxicology [3 cr.]
This course covers the fundamental and mechanistic aspects of toxicology, with emphasis on the mechanisms of toxicants, pathophysiology, clinical manifestations, and on the management of toxic exposures and antidotal therapy.
Prerequisites: PHA330, PHA430 and PHA422.
Co-requisites: Professional Year 2 status.

PHA510 U.S. Pharmacy Law and Regulation [2 cr.]
This course covers the federal laws that affect the regulation of drugs and the practice of pharmacy. The course helps the students realize and understand the general principles of the federal law related to drug control and to pharmacy practice.
Co-requisites: Professional Year 3 status.

PHA512 Lebanese Pharmacy Law and Regulation [1 cr.]
This course covers the regulations of pharmacy practice in Lebanon including the requirements to become a licensed pharmacist, to establish a community pharmacy, to operate a hospital pharmacy, and to receive a license for manufacturing a drug or importing any substance that falls under its category. The course covers the registration process of any substance considered a drug at the Ministry of Public Health department, including its pricing regulation and profit allowance. It also sheds the light on situations whereby a pharmacist can dispense, substitute a medication or make changes to the dosing regimen. Other topics discussed include the responsibilities and rights of pharmacy inspection/audit from the Lebanese Ministry of Public health and any other regulatory body, and definition of felony or crime and determine its respective penalty measures. Finally, this course covers all the regulations related to establishing the Lebanese Order of Pharmacists, including its mission, goals, organization structure, executive board, committees, retirement plan, financial operations, elections, and inspection.
Co-requisites: Professional Year 3 status.

PHA550 Introduction to Pharmacogenomics [1 cr.]
This course covers the relationship of genetic individual variability to drug response.
Prerequisites: PHA430.
Co-requisites: Professional Year 3 status.

PHA557 Pharmacoeconomics [3 cr.]
This course is an introduction to the role of pharmacoeconomics in the health care system, with emphasis on research outcomes. This course covers the application of pharmacoeconomic analysis in clinical practice.
Prerequisites: PHA333 and PHA421.
Co-requisites: Professional Year 3 status.

PHA560 Clinical Nutrition & Diet Therapy [2 cr.]
This course covers the principles of nutrition, with emphasis on the nutritional aspects of carbohydrates, lipids, proteins, vitamins, electrolytes and trace elements. Total parenteral nutrition, enteral nutrition, nutrition for growth and development, and nutrition care of selected disease states will be covered.
Prerequisites: PHA340, PHA441, PHA442, PHA443, PHA444 and PHA445.
Co-requisites: Professional Year 3 status.

PHARMACY PRACTICE DEPARTMENT

PHA340 Pharmacotherapeutics I [2 cr.]
This is the first in a series of six courses addressing the pharmacotherapeutic principles and functional consequences of the disease state. Discussion will focus on the therapeutic problem solving and the evaluation of drugs commonly used in clinical practice. Individualization of pharmacotherapy, selection of appropriate drug regimen, with its efficacy and toxicity monitoring parameters,
and the assessment of various drug interactions, and their adverse reactions, are covered. Disease prevention, patient counseling, and pharmacoconomics issues will be an integral part of each disease state management. Pharmacotherapeutics of psychiatric diseases will be discussed.

Prerequisites: PHA210, PHA312 and PHA320.
Corequisites: PHA330 and Professional Year 1 status.

PHA398 Pharmacy Practice Management I [3 cr.]
This course covers the aspects of practical experiences in selected pharmacy management settings, under the supervision of pharmacists and clinical faculty coordinators. Community pharmacy management approaches and styles, organizational principles, personnel, purchasing and inventory control, pricing, professional fees, community pharmacy services, and the Lebanese law are covered.
Prerequisites: PHA210, PHA313, PHA316, PHA322, PHA333, PHA320, PHA330, PHA340.
Co-requisites: Professional Year 1 status.

PHA441 Pharmacotherapeutics II [3 cr.]
This course focuses on endocrinologic and oto/ophthalmologic diseases, and women's health.
Prerequisites: PHA210, PHA313, PHA316, PHA320 and PHA398.
Corequisites: PHA430 and Professional Year 2 status.

PHA442 Pharmacotherapeutics III [3 cr.]
This course focuses on the pulmonary, gastrointestinal, arthritic and nephrologic diseases.
Prerequisites: PHA210, PHA313, PHA316, PHA320, and PHA398.
Corequisites: PHA430 and Professional Year 2 status.

PHA443 Pharmacotherapeutics IV [3 cr.]
This course focuses on the cardiovascular and dermatologic diseases.
Prerequisites: PHA210, PHA313, PHA316, PHA320, PHA398 and PHA430.
Co-requisites: Professional Year 2 status.

PHA444 Pharmacotherapeutics V [3 cr.]
This course focuses on infectious diseases.
Prerequisites: PHA210, PHA211, PHA313, PHA316, PHA320, PHA398 and PHA430.
Co-requisites: Professional Year 2 status.

PHA445 Pharmacotherapeutics VI [3 cr.]
This course focuses on the hematological/oncologic, neurologic, genitourinary, and reproductive system diseases.
Prerequisites: PHA210, PHA313, PHA316, PHA320, PHA398 and PHA430.
Co-requisites: Professional Year 2 status.

PHA449 Dispensing and Pharmaceutical Care [3 cr.]
This course covers the techniques and skills required to safely and accurately dispense prescription and non-prescription drug products to patients. Emphasis will be on computerized patient record keeping, interpreting and evaluating prescriptions, as well as tips for patient counseling.
Prerequisites: PHA322, PHA340, PHA430, PHA441 and PHA442.
Corequisites: PHA443, PHA444, PHA445, PHA452 and Professional Year 2 status.

PHA497 Introduction to Professional Pharmacy Practice Experience [1 cr.]
This course is an introduction to the practice of pharmaceutical care, through a structured early learning experience in a clinical setting and under the supervision of a clinical faculty member.
Prerequisites: PHA210, PHA313, PHA316, PHA320, PHA322, PHA333, PHA330 and PHA340.
Co-requisites: Professional Year 2 status.

PHA499 Pharmacy Practice Management II [2 cr.]
This course is a continuation of PHA398. It covers the aspects of practical experiences in selected hospital pharmacy management environments, under the supervision of pharmacists and clinical faculty coordinators. It also covers the management approaches and services provided in hospital pharmacies, in
accordance with the Lebanese law.
Prerequisites: PHA210, PHA313, PHA316, PHA322, PHA333, PHA320, PHA330 and PHA340.
Co-requisites: Professional Year 2 status.

PHA515 Pharmacy Seminar [1 cr.]
This course entails discussions of current literature as well as issues concerning the pharmacy profession.
Prerequisites: PHA340, PHA421, PHA422, PHA441, PHA442, PHA443, PHA444 and PHA445.
Co-requisites: Professional Year 3 status.

PHA570 Professional Pharmacy Practice – Hospital/DIC Experience [6 cr.]
This course covers pharmacy practice in a hospital setting and at a drug information center. It covers the principles of hospital pharmacy management rules and regulations, drug distribution systems, patient-oriented pharmacy services, as well as the principles of evidenced-based medicine and the systemic approach in answering drug information questions and analyzing the literature.
Prerequisites: Passing all the PHA courses from the professional years.
Co-requisites: Professional Year 3 status.

PHA571 Professional Pharmacy Practice – Community Experience [6 cr.]
This course covers the pharmacy practice in a community setting. It deals with the principles of community pharmacy management rules and regulations, drug distribution systems, and patient-oriented pharmacy services which include dispensing medications, communicating with patients and health professionals, providing proper information, and monitoring the patient profiles for drug interactions, medication noncompliance, and inappropriate drug therapy.
Prerequisites: Passing all the PHA courses from the professional years.
Co-requisites: Professional Year 3 status.

PHA572 Professional Pharmacy Practice – In-Patient Care Experience [12 cr.]
This course covers the use of therapeutic problem-solving skills, and the knowledge of the appropriate use of medications in patient care environments, which include patient monitoring, therapeutic consultation, and in-service presentation and communication with health care professionals and patients.
Prerequisites: Passing all the PHA courses from the professional years.
Co-requisites: Professional Year 3 status.

PROFESSIONAL PHARMACY ELECTIVES
Note: Electives will be offered under the same course number: PHA567 (Special Topics) and would include, but not restricted to, the following listed courses.

PHA523 Clinical Pharmacokinetics [1 cr.]
This course covers the application of pharmacokinetics principles for the rational design and monitoring of individualized dosage regimen for commonly used and low-therapeutic-index drugs.
Prerequisites: PHA422.
Co-requisites: Professional Year 3 status.

PHA567 Special Topics - Public Health [1 cr.]
This course introduces topics of public health to the students of pharmacy. The course looks at leading causes of death, and measures of morbidity/mortality. Topics related to outbreaks, screening, vaccinations, health determinants, major chronic diseases, and public health program planning and evaluation are covered in the course.
Co-requisites: Professional Year 1 status.

PHA567 Special Topics - Immunizations [1 cr.]
This course will provide students with the knowledge of vaccine-preventable diseases and the role of pharmacists as vaccine advocates.
Co-requisites: Professional Year 1 status.
PHA567 Special Topics - First Aid [1 cr.]
This course introduces students to first aid skills needed to respond to respiratory and cardiac emergencies, to reduce pain, and to minimize the consequences of injury or sudden illness.
*Co-requisites: Professional Year 2 status.*

PHA567 Special Topics - Cosmeceuticals and dermatology [1 cr.]
This course will provide pharmacy students with a well-rounded knowledge on skin diseases and skin care methods mostly seen in the outpatient setting.
*Co-requisites: Professional Year 2 status.*

PHA567 Special Topics - Drug Interactions [1 cr.]
This course focuses on assessment and application of drug interaction information and identification, and management of commonly encountered drug interactions by therapeutic category.
*Co-requisites: Professional Year 2 status.*

PHA567 Special Topics - Career Opportunities [1 cr.]
This course will provide students with insights into different pharmacy career opportunities.
*Co-requisites: Professional Year 2 status.*

PHA567 Special Topics - Pharmacoepidemiology [1 cr.]
This course introduces the students to the principles, concepts and application of epidemiology in the field of pharmaceutical sciences. The course consists of lectures, assigned readings that provide the students with basic knowledge and tools relevant to pharmacoepidemiology practice.
*Co-requisites: Professional Year 3 status.*

REQUIRED/ELECTIVE: ADVANCED PHARMACY PRACTICE EXPERIENCE DESCRIPTIONS
Numerous and various experiences are available for the Doctor of Pharmacy advanced practice rotations, including: institutional health care systems, community pharmacies, pharmaceutical industry, and clinical and pharmaceutical sciences’ research opportunities. The experience is supervised by skilled preceptors. Yearly, the chair of the Pharmacy Practice will prepare a list of the currently available experiences.

Experience Selection
Students will be matched with the rotation sites based on the students’ choice and availability. In July, students are asked to rank, in order of preference, the elective rotations they would like to do. Selection of sites is checked upon by Chair of the Pharmacy Practice Department and the Director of Experiential Education.

Experience Scheduling
The Chair of the Pharmacy Practice, the Director of Experiential Education and the site coordinators schedule all experiences. Students are asked not to contact individual preceptors to schedule or reschedule the experience elective. Students desiring to modify their schedule need to approach the Director of Experiential Education, with a valid excuse, by the third and the fourth week of July before the start of the first experience.

REQUIRED ADVANCED PHARMACY PRACTICE EXPERIENCES
PHA670–PHA673 (12 cr)
The required experiences are designed to allow the student to develop a strong understanding of specific areas of ambulatory care, community pharmacy practice, hospital/health system pharmacy practice and acute care internal principles. The goals that students should achieve during this module are to further understand the pathophysiology and treatment of various diseases commonly encountered, and to develop strong and advanced skills in the design and monitoring of rational pharmacotherapy regimens and how they can utilize available data to maximize patient care. The students will also work with both the medical and pharmacy services, and will provide pharmaceutical care to the patients. The students will gain the relevant knowledge while learning valuable information for their future practice. Students will also gain strong skills in professional and educational communications all under the mentoring
of the clinical pharmacy experienced preceptors.  
*Prerequisites: Bachelor of Science in Pharmacy and Professional Year IV status.*

**PHA650 Elective Advanced Pharmacy Practice**  
The elective experience is designed to allow the student to develop a stronger understanding of a specialty area.  
For direct patient care experiences, the goals that students should achieve during this elective experience are generally to further understand the pathophysiology and treatment of various diseases in that specialty, and to develop strong and advanced skills in the design and monitoring of rational pharmacotherapy regimens and how they can utilize the available data to maximize patient care.  
Students will work closely with the chief of department or the chief resident, and under the close mentoring from a clinical pharmacy faculty member.  
Furthermore, the students will provide pharmaceutical care to the patients and will gain the relevant knowledge while learning valuable information for their future practice.  
For non-direct patient care experiences, the goals that the students should achieve are dependent on the elected experience. In general, all experiences are designed to allow students to gain further knowledge, and to develop the required skills and information for their future practice. Students are required to choose three topics, based on availability.  
*Prerequisites: Bachelor of Science in Pharmacy/Professional Year IV status.*

**PHA689 Pharmacy Project**  
This course will be offered as an elective to all Pharm.D. students who wish to engage in research. At the beginning of the academic year, a list of potential research projects will be generated by the School of Pharmacy from which students can choose.