

DOCTOR OF PHARMACY (PRACTICING DOCTORATE)

Main Language of Instruction:

French ☐ English ☒ Arabic ☐

Campus Where the Program Is Offered: CSM

OBJECTIVES

The Faculty aims to train healthcare professionals who are specialists in medications and various healthcare products by providing the academic and scientific foundation that enables its students to succeed and excel professionally in the various fields of this multidisciplinary profession. It aims to train competent and responsible specialists for society. This degree program provides students with a well-rounded education that enables them to specialize and practice in a variety of fields: community pharmacy, industry, hospital and clinical pharmacy, medical analysis laboratories, and biological and pharmaceutical research, and more. In addition to lectures and seminars, the program includes numerous practical exercises and professional internships in various sectors, with the goal of helping students acquire in-depth scientific, medical, and pharmaceutical knowledge, as well as the skills necessary to practice the profession.

PROGRAM LEARNING OUTCOMES (COMPETENCIES)

- Provide pharmaceutical care in a pharmacy and dispense medicines and health products
- Manage a pharmacy
- Provide pharmaceutical care in a hospital
- Contribute to the development of pharmaceutical products (production, marketing, quality control, etc.)
- Ensure compliance with current laws in the public and private sectors (Ministry of Public Health (MOPH), Cooperative of State Employees (CSE), National Social Security Fund (NSSF), Insurance, etc.)
- Act with ethics and professionalism
- Participate in the development of pharmaceutical research, innovation and entrepreneurship.
- Participate in health promotion

PROGRAM REQUIREMENTS

360 credits: Required Courses (303 credits), Institution's Elective Courses (14 credits), Open Elective Courses (10 credits), and USJ General Education Program (33 credits).

Fundamental Courses (317 Cr.)

Required Courses (303 Cr.)

Analytical Chemistry (4 Cr.). Analytical Chemistry Practical Work (2 Cr.). Article Reading and Analysis I (2 Cr.). Article Reading and Analysis II (2 Cr.). Biochemistry Practical Work (1 Cr.). Biopharmacy (2 Cr.). Biophysics + Practical Work (3 Cr.). Biostatistics (2 Cr.). Botanic + Practical Work (4 Cr.). Cell Biology + Practical Work (3 Cr.). Clinical Biochemistry (3 Cr.). Clinical Biology Internship + Report + Validation (6 Cr.). Clinical Pharmacy AD I (3 Cr.). Clinical Pharmacy AD II (3 Cr.). Clinical Pharmacy I (3 Cr.). Clinical Pharmacy II (3 Cr.). Communication and Research Methodology (3 Cr.). Communication I (2 Cr.). Dental Care (2 Cr.). Dissertation/Thesis (8 Cr.). Drugs Interactions (2 Cr.). Emergency Toxicology (3 Cr.). Endocrinology (2 Cr.). Entrepreneurship in Pharmacy (2 Cr.). Experimental Pharmacy + Validation I (5 Cr.). Experimental Pharmacy + Validation II (5 Cr.). Experimental Pharmacy + Validation III (5 Cr.). First Aid (2 Cr.). Foundations of Healthy Nutrition (2 Cr.). General Biology (3 Cr.). General Chemistry (3 Cr.). General Pharmacology (4 Cr.). Genetics (3 Cr.). Genomics and Medical Applications (2 Cr.). Hematology + Pathology + Practical Work (4 Cr.). Heterocyclic Organic Chemistry (3 Cr.). Hospital Internship (11 Cr.). Human Anatomy and Physiology I (5 Cr.). Human Anatomy and Physiology II (4 Cr.). Hydrology (1 Cr.). Hygiene (2 Cr.). Immunology + Pathology + Practical Work (4 Cr.). Industrial Pharmacy Practical Work (1 Cr.). Inorganic Chemistry + Practical Work (2 Cr.). Integrated Synthesis (3 Cr.). Integrated Teaching I (1 Cr.). Integrated Teaching II (2 Cr.). Introduction to Food (2 Cr.). Introduction to Market Access (2 Cr.). Introduction to Occupational Therapy (2 Cr.). Introduction to Pharmacy (3 Cr.). Introduction to Pharmacy Internship I-II (5 Cr.). Management and Accounting (2 Cr.). Marketing (2 Cr.). Mechanisms of Toxicity, Carcinogenesis, and Regulation (2 Cr.). Medical Biotechnology

(2 Cr.). Medical Law (2 Cr.). Metabolic Biochemistry (4 Cr.). Microbial World (3 Cr.). Molecular Biology + Practical Work (4 Cr.). Molecular Pharmacology and Biostatistics (2 Cr.). Nursing Care Tools (2 Cr.). Nutrition (3 Cr.). Organic Chemistry I (3 Cr.). Organic Chemistry II (4 Cr.). Organic Chemistry Practical Work (2 Cr.). Orthopedics and Medical Device Orthotics (2 Cr.). Parasitology - Mycology + Practical Work (4 Cr.). Pathological Semiology (4 Cr.). Personal Skills (2 Cr.). Pharmaceutical Ethics (2 Cr.). Pharmaceutical Legislation (2 Cr.). Pharmaceutics I (2 Cr.). Pharmaceutics II (4 Cr.). Pharmaceutics III (4 Cr.). Pharmaceutics Practical Work + Integrated Synthesis Practical Work (1 Cr.). Pharmacognosy (4 Cr.). Pharmacokinetics (4 Cr.). Pharmacy Internship I, Pharmacy Follow-up, and Report (6 Cr.). Pharmacy Internship II, Pharmacy Follow-up, and Report (6 Cr.). Pharmacy Internship III, Pharmacy Follow-up, and Report (6 Cr.). Pharmacy or Industrial Internship + Validation (1 Cr.). Physics (3 Cr.). Phytotherapy and Aromatherapy (2 Cr.). Practical Approaches in Pharmacy (2 Cr.). Public Health (2 Cr.). Quality Assurance of Health Products (3 Cr.). Regulatory and Industrial Affairs (2 Cr.). Social Legislation (2 Cr.). Special Microbiology I + Practical Work (2 Cr.). Special Microbiology II (4 Cr.). Special Microbiology Practical Work (1 Cr.). Special Pharmacology (4 Cr.). Special Pharmacology I (4 Cr.). Special Pharmacology II + Oncology (4 Cr.). Special Pharmacology Practical Work (1 Cr.). Structural Biochemistry (3 Cr.). Therapeutic Chemistry I (3 Cr.). Therapeutic Chemistry II (2 Cr.). Toxicology (4 Cr.). Toxicology Practical Work (1 Cr.). Virology (2 Cr.).

Institution's Elective Courses (14 Cr.), to be chosen from the list below:

Advanced Dietetics and Nutrition (2 Cr.). Cellular Signaling, Therapeutic Targets in Metabolic, Cardiovascular, and Immunotoxicology Disorders (2 Cr.). Cellular and Integrated Pharmacology in Neurosciences and Infectiology (2 Cr.). Clinical and Experimental Toxicology (2 Cr.). Health Economics (2 Cr.). Innovative Therapies: From Patent to Commercialization (2 Cr.). Internship in Pharmaceutical Firms or Industries (4 Cr.). Over the Counter Medication (OTC) (2 Cr.). Research Internship (Biochemistry, Molecular Biology, Microbiology, Pharmacology, Toxicology) (4 Cr.). Risk Insurance Elements (2 Cr.). Sales Techniques (2 Cr.).

Open Elective Courses (10 Cr.)

USJ General Education Program (33 Cr.)

Code	Course Name	Credits
	ENGLISH OR OTHER LANGUAGE	4
004AGI3I3	English	4
	ARABIC	2
	<i>Arabic Language and Culture</i>	2
435LALML2	Arabic Language and Media	2
	HUMANITIES	9
064VALEL1	USJ Values in Daily Life	2
	<i>Ethics</i>	3
018EPFPL2	Professional Ethics in Pharmacy	3
	<i>Civic Engagement and Citizenship</i>	2
004LCADS1	Addictive Behaviors and Dependencies	2
	<i>Other Humanities Course</i>	2
004PSYCI4	Psychology	2
	SOCIAL SCIENCES	6
	<i>Professional Integration and/or Entrepreneurship</i>	2
004WORN56	Work Ready Now	2
	<i>Other Social Sciences Courses</i>	4
004SOLOI2	Health Sociology	2
004EVENI2	Creativity in Sustainable Development	2

	COMMUNICATION TECHNIQUES	6
004EXPCI1	Communication Skills	3
004COMMS5	Communication II	3
	QUANTITATIVE TECHNIQUES	6
004MAST11	Mathematics and Statistics	4
004FONII2	Computer Science	2

SUGGESTED STUDY PLAN

Semester 1

Code	Course Name	Credits
435LALML2	Arabic Language and Media	2
004BIOLI1	Cell Biology + Practical Work	3
004COMEI1	Communication and Research Methodology	3
004EXPCI1	Communication Skills	3
004CHGEI1	General Chemistry	3
004GENEI1	Genetics	3
004SANEI2	Hygiene	2
004CHIOI1	Inorganic Chemistry + Practical Work	2
004MAST11	Mathematics and Statistics	4
004PHIII1	Physics	3
	Open Elective Course	2
	Total	30

Semester 2

Code	Course Name	Credits
004LADAI2	Article Reading and Analysis I	2
004REGVI2	Botanic + Practical Work	4
004FONII2	Computer Science	2
004EVENI2	Creativity in Sustainable Development	2
004BALSI2	Foundations of Healthy Nutrition	2
004BLGEI1	General Biology	3
004SOLOI2	Health Sociology	2
004ANPHI2	Human Anatomy and Physiology I	5
004NOMPI2	Introduction to Pharmacy	3
004CHIII2	Organic Chemistry I	3
008PSKLL3	Personal Skills	2
	Total	30

Summer Trimester I

Code	Course Name	Credits
004SOPRI4	Dental Care	2
004INSPI2	Introduction to Pharmacy Internship I-II	5
004SOFRI2	Pharmacy Internship I, Pharmacy Follow-up, and Report	6
004PEVAI2	Practical Approaches in Pharmacy	2
	Total	15

Semester 3

Code	Course Name	Credits
004CANAI3	Analytical Chemistry	4
004BIPHI3	Biophysics + Practical Work	3
004AGI3I3	English	4
004ANHUI3	Human Anatomy and Physiology II	4
004LEMII3	Microbial World	3
004MOLBI3	Molecular Biology + Practical Work	4
004CHORI3	Organic Chemistry II	4
004PACII3	Pharmacokinetics	4
	Total	30

Semester 4

Code	Course Name	Credits
004TPCAI4	Analytical Chemistry Practical Work	2
004CEORI4	Heterocyclic Organic Chemistry	3
004IALII4	Introduction to Food	2
004CHTPI4	Organic Chemistry Practical Work	2
004PHQEI4	Pharmaceutics I	2
018EPFPL2	Professional Ethics in Pharmacy	3
004PSYCI4	Psychology	2
004HYSAI4	Public Health	2
004QLTEI4	Quality Assurance of Health Products	3
004BIOMI2	Structural Biochemistry	3
064VALEL1	USJ Values in Daily Life	2
004TEVEI4 or 004ELASI4	Institution's Elective Courses: Sales Techniques or Risk Insurance Elements	2
	Open Elective Course	2
	Total	30

Summer Trimester II

Code	Course Name	Credits
004PHEVI4	Experimental Pharmacy + Validation I	5
494INERL3	Introduction to Occupational Therapy	2
005TSPHL2	Nursing Care Tools	2
004SUOFI4	Pharmacy Internship II, Pharmacy Follow-up, and Report	6
	Total	15

Semester 5

Code	Course Name	Credits
004LCADS1	Addictive Behaviors and Dependencies	2
004BTSQS1	Biostatistics	2
004PHAMS1	General Pharmacology	4
004HEMAS1	Hematology + Pathology + Practical Work	4
004BITHS1	Medical Biotechnology	2
004PAMYS1	Parasitology - Mycology + Practical Work	4
004SEPAS1	Pathological Semiology	4
004PAGAS1	Pharmaceutics II	4
004SYINS1	Pharmaceutics Practical Work + Integrated Synthesis Practical Work	1
004MSPES1	Special Microbiology I + Practical Work	2
004DIONS2 or 004UVES1	Institution's Elective Course Advanced Dietetics and Nutrition or Health Economics	2
	Open Elective Course	2
	Total	33

Semester 6

Code	Course Name	Credits
004TPBIS2	Biochemistry Practical Work	1
004BORIS2	Biopharmacy	2
004HYDOS2	Hydrology	1
004IPEAS2	Immunology + Pathology + Practical Work	4
004IELES2	Industrial Pharmacy Practical Work	1
004ENINS2	Integrated Teaching I	1
004BIOMS2	Metabolic Biochemistry	4
004PHMES2	Pharmacognosy	4
004PHLES2	Special Pharmacology	4
004CHITS2	Therapeutic Chemistry I	3
004UVPCS1 or 004DIONS2	Institution's Elective Course Over the Counter Medication (OTC) or Advanced Dietetics and Nutrition	2
	Total	27

Summer Trimester III

Code	Course Name	Credits
004COMUS2	Communication I	2
004PHEXS2	Experimental Pharmacy + Validation II	5
004IMACS2	Introduction to Market Access	2
004SUIOS2	Pharmacy Internship III, Pharmacy Follow-up, and Report	6
	Total	15

Semester 7

Code	Course Name	Credits
004SBLGS3	Clinical Biochemistry	3
004PECLS3	Clinical Pharmacy I	3
004ETPHS3	Entrepreneurship in Pharmacy	2
004SECOS3	First Aid	2
004PHAGS3	Pharmaceutics III	4
004MIBOS3	Special Microbiology II	4
004TPMIS3	Special Microbiology Practical Work	1
004PHSOS4	Special Pharmacology II + Oncology	4
004CHT3S3	Therapeutic Chemistry II	2
004TOXIS3	Toxicology	4
004TOXXS4	Toxicology Practical Work	1
	Open Elective Course	2
	Total	32

Semester 8

Code	Course Name	Credits
004TEQES4	Clinical Pharmacy II	3
004INTES4	Drugs Interactions	2
004TODUS4	Emergency Toxicology	3
004ENLOS4	Endocrinology	2
004GEAMM1	Genomics and Medical Applications	2
004ENITS4	Integrated Teaching II	2
004MATCM1	Mechanisms of Toxicity, Carcinogenesis, and Regulation	2
004PHMBM1	Molecular Pharmacology and Biostatistics	2
004NUTRS4	Nutrition	3
004PHYTS4	Phytotherapy and Aromatherapy	2
004PHSPS3	Special Pharmacology I	4
004PHAPS3	Special Pharmacology Practical Work	1
004VIROS4	Virology	2
	Total	30

Summer Trimester IV

Code	Course Name	Credits
004STBCS4	Clinical Biology Internship + Report + Validation	6
004PAEXS4	Experimental Pharmacy + Validation III	5
004SCCTM1	<u>Institution's Elective Courses</u> Choose two of the following courses: Cellular Signaling, Therapeutic Targets in Metabolic, Cardiovascular, and Immunotoxicology Disorders (2 Cr.)	8
004TIBCM1	Innovative Therapies: From Patent to Commercialization (2 Cr.)	
004TCEXM1	Clinical and Experimental Toxicology (2 Cr.)	
004PCINM1	Cellular and Integrated Pharmacology in Neurosciences and Infectiology (2 Cr.)	
004STDEM1	Choose one of the following courses: Research Internship (Biochemistry, Molecular Biology, Microbiology, Pharmacology, Toxicology) (4 Cr.)	
004STPHM1	Internship in Pharmaceutical Firms or Industries (4 Cr.)	
	Total	19

Semester 9

Code	Course Name	Credits
004LADAS5	Article Reading and Analysis II	2
004PHACS5	Clinical Pharmacy AD I	3
004PHCCS6	Clinical Pharmacy AD II	3
004COMMS5	Communication II	3
004GESTS5	Management and Accounting	2
004MARKS5	Marketing	2
004DRMES5	Medical Law	2
004HIQMS5	Pharmaceutical Ethics	2
004LEPHS5	Pharmaceutical Legislation	2
004COMES5	Regulatory and Industrial Affairs	2
004LEGSS5	Social Legislation	2
004WORN56	Work Ready Now	2
	Open Elective Course	2
	Total	29

Semester 10

Code	Course Name	Credits
004MMOIS6	Dissertation/Thesis	8
004STAH56	Hospital Internship	11
004SYNIS5	Integrated Synthesis	3
004OTMES5	Orthopedics and Medical Device Orthotics	2
004STAGS6	Pharmacy or Industrial Internship + Validation	1
	Total	25

COURSE DESCRIPTION

004LCADS1	Addictive Behaviors and Dependencies	2 Cr.
------------------	---	--------------

By the end of this course, the student will be able to:

- Identify the mechanisms involved in dependence on psychoactive substances.
- Recognize the toxic effects induced by the main drugs (cannabis, opioids, cocaine, amphetamines, GHB, etc.).
- Recognize the main substances used in sports doping and their toxic effects on the body.
- Report on the experience of specialized physicians (psychiatrists, emergency physicians) as well as representatives of NGOs involved in the treatment of and fight against drug use and addiction in Lebanon.

004DIONS2	Advanced Dietetics and Nutrition	2 Cr.
------------------	---	--------------

This course is delivered in the third year of the professional Doctor of Pharmacy program, during the second semester.

The course aims to deepen students' knowledge of nutrition and to guide them in understanding the relationship between dietary management and certain chronic diseases.

Throughout the different chapters, students will acquire fundamental concepts as well as an understanding of the beneficial effects and potential drawbacks of specific dietary components. They will also explore the impact of various diets across different stages of life, particularly in relation to chronic diseases and other health conditions.

004CANAI3	Analytical Chemistry	4 Cr.
------------------	-----------------------------	--------------

This course aims to provide students with the essential theoretical knowledge required for the functional analysis of the major classes of biomolecules, as well as active substances used in pharmacology. At the same time, it enables a deeper understanding of the spectroscopic techniques most commonly used in laboratories, with a particular emphasis on practical applications.

The objective is twofold:

1. To acquire the fundamental principles of chemistry and understand the structure–property relationship of biological and pharmaceutical molecules.
2. To master spectroscopic methodologies, with a focus on their practical application in the laboratory.

004TPCAI4	Analytical Chemistry Practical Work	2 Cr.
------------------	--	--------------

This course introduces the fundamental principles of qualitative and quantitative chemical analysis in both aqueous and non-aqueous media. Students will study acid–base, redox, precipitation, and complexation equilibria, which form the foundation of chemical analytical methods. The course aims to familiarize students with the theoretical concepts and practical tools used in modern analytical chemistry. In addition to volumetric assays of pharmaceutical compounds performed according to pharmacopeial methods, the course covers advanced spectroscopic and analytical techniques. Laboratory reports include the interpretation of spectra obtained from Nuclear Magnetic Resonance (NMR) spectroscopy, Mass Spectrometry (MS), Gas Chromatography (GC), and High-Performance Liquid Chromatography (HPLC). These activities enable students to apply and deepen their understanding of contemporary analytical methodologies. Complementary training is also provided in the analysis of spectra obtained from visible, ultraviolet (UV), and infrared (IR) spectroscopy.

Finally, the course introduces selected analytical strategies for the detection of counterfeit medicines, illustrating the practical application of analytical techniques in real-world contexts relevant to the pharmaceutical industry and public health protection.

435LALML2	Arabic Language and Media	2 Cr.
------------------	----------------------------------	--------------

This course introduces Modern Standard Arabic (MSA) through an interactive approach combining language learning, cultural awareness, and the development of critical thinking. In this track, media serve as a gateway to the Arabic language and to a deeper understanding of the contemporary Arabic world. Drawing on a variety of authentic materials – including newspapers, audiovisual and social media, and digital content – students explore major issues and debates shaping contemporary Arabic societies. The course aims to develop students' skills in comprehension and expression in MSA. It also encourages critical engagement with media discourse and reflection on the role of media in contemporary societies.

004LADA12	Article Reading and Analysis I	2 Cr.
------------------	---------------------------------------	--------------

This course introduces first-year pharmacy students to the fundamentals of scientific research and critical reading. It aims to develop their understanding of the scientific method and their ability to analyze, interpret, and communicate scientific data.

The first chapter covers the main stages of the research process, from formulating a research question to designing the methodology, while highlighting the role of the pharmacist as a researcher. It also introduces the structure of a scientific article using the IMRAD format (Introduction, Methods, Results, and Discussion) and presents key indicators used to evaluate scientific journals.

Two chapters are dedicated to literature searching and the use of major scientific databases. A major component of the course focuses on epidemiology, including essential epidemiological measures and the different types of studies, such as interventional and observational designs.

Practical sessions allow students to apply these concepts through the analysis of scientific abstracts. The course also addresses the critical appraisal of full research articles, as well as the interpretation of tables and figures. Emphasis is placed on scientific writing, especially the preparation of abstracts and the presentation of results. Upon successful completion of the course, students will have acquired foundational skills in scientific research, critical appraisal, and scientific communication.

004LADAS5	Article Reading and Analysis II	2 Cr.
------------------	--	--------------

This course aims to equip fifth-year pharmacy students with the essential skills to read, understand, and critically evaluate scientific literature in the fields of biomedical sciences, pharmacology, and toxicology. Through the study and discussion of recent scientific articles, students will develop their critical thinking, scientific analysis skills, and their ability to communicate and present scientific information effectively. By the end of this course, students will be able to:

Master literature searching using major reference databases (PubMed, EM-Premium, ClinicalTrials.gov) to retrieve and validate scientific evidence required for pharmaceutical decision-making.

Identify the key stages involved in developing a research project, from its conception to publication.

Perform critical analysis of experimental and clinical methodologies and results.

Detect potential biases and limitations in published studies in order to assess their reliability.

004TPBIS2	Biochemistry Practical Work	1 Cr.
------------------	------------------------------------	--------------

The practical sessions for this course focus on the quantification of biomolecules and the demonstration of some of their chemical properties. The main objective is to apply theoretical principles to practical situations, enabling students to gain a better understanding of the analytical methods used in biological chemistry and serum assays. Students will study the kinetics of an enzymatic reaction to determine the reaction constants and the reaction rate.

Students will be required to compile, format, and present the results of their experiments according to scientific standards. Each pair of students will prepare a detailed laboratory report describing the experiments carried out and the conclusions drawn from them.

004BORIS2	Biopharmacy	2 Cr.
------------------	--------------------	--------------

This course focuses on drug development. It is a comprehensive approach that uses pharmacological data (pharmacodynamic and pharmacokinetic) together with pharmaceutical technology data to create the medication best suited to therapeutic needs.

This course deals with the study of the drug's journey from the site of administration to the bloodstream. This study includes the influence of formulation, manufacturing technology, and physiological factors related to the administration site on drug availability, as well as all the effects observed following drug administration.

The course is limited to the biopharmaceutics of solid oral dosage forms, which account for nearly 70% of the medicines available on the market.

004BIPH13	Biophysics + Practical work	3 Cr.
------------------	------------------------------------	--------------

This course complements the "Physics" course delivered in the first year, where physical principles and laws are applied to interpret and explain biological phenomena occurring in the human body—knowledge that is essential for students in medical sciences.

The course covers the properties of electrolytic aqueous ionic solutions and their applications in iontophoresis, as well as the concepts of acid–base balance in the human body, including buffer systems, regulation mechanisms, and related disorders. It also introduces the fundamental principles of the interaction between electromagnetic radiation and matter, along with dosimetry and radiotherapy. Practical laboratory sessions are included to illustrate and reinforce these concepts.

004BTSQS1	Biostatistics	2 Cr.
------------------	----------------------	--------------

This course aims to enable third-year pharmacy students to:

- Understand the main statistical methods used for the analysis of clinical data.
- Understand the principles of interventional clinical studies and pharmacoepidemiological research.
- Be able to use IBM SPSS (or PSPP software) to perform standard statistical analyses of data.
- Be able to critically appraise the statistical methodology and study protocols in scientific articles.

004REGVI2	Botanic + Practical Work	4 Cr.
------------------	---------------------------------	--------------

The Botanic course is a compulsory and fundamental subject in the Doctor of Pharmacy program. It introduces future pharmacists to plant biology, including plant functions, life cycles, and ecology, while providing them with the skills needed to identify different botanical families, their morphological characteristics, and their main representative species.

The teaching of this course is based on both lectures and practical laboratory sessions. It constitutes an essential prerequisite for the study of Pharmacognosy.

004BIOLI1	Cell Biology + Practical Work	3 Cr.
------------------	--------------------------------------	--------------

This course focuses on an in-depth study of the cell, the fundamental unit of living systems and tissues. It aims to provide pharmacy students with essential knowledge in cell biology to understand diseases, drug actions, and biological analyses.

Structured into nine chapters, the course offers a progressive understanding of cellular organization and function. It first addresses the organization of living systems and the main biomolecules, then presents cell theory and the different types of cells. Cell membranes, cellular transport, and extracellular interactions are also studied. The nucleus, organelles, energy systems, and the cytoskeleton are examined in terms of their roles and functions. Finally, apoptosis is covered, completing the foundational knowledge required to understand fundamental biological mechanisms.

004PCINM1	Cellular and Integrated Pharmacology in Neurosciences and Infectiology	2 Cr.
------------------	---	--------------

This course offers an integrated two-part approach aimed at introducing students to research in neuropharmacology and infectious diseases.

The neuropharmacology component aims to provide future graduates with the most up-to-date conceptual foundations for studying certain common neurological diseases and for developing new therapeutic targets. For each disease, the course is structured in five stages: 1- review of pathophysiology and pharmacotherapy; 2- identification of potential new pharmacological targets and biological markers; 3- presentation of current therapies being developed in research laboratories; 4- in-depth description of animal models and evaluation tests used in preclinical studies of these conditions; 5- analysis of selected preclinical studies along with a discussion of their results.

The infectious diseases component is designed as an advanced integrative course at the interface of clinical microbiology, anti-infective pharmacology, immunology, molecular biology, neuroscience, and public health. It is organized around three complementary modules:

(1) microbiota, inflammation and systemic interactions; (2) anti-infective pharmacology, resistance, molecular diagnostics and innovative alternatives; (3) immunopharmacology, vaccines and targeted therapies.

The objective of this course is to develop Master's (M1)-level scientific and pharmaceutical reasoning capable of integrating molecular mechanisms, data interpretation, methodological choices, therapeutic innovation, patient safety, and clinical relevance.

004SCCTM1	Cellular Signaling, Therapeutic Targets in Metabolic, Cardiovascular, and Immunotoxicology Disorders	2 Cr.
------------------	---	--------------

This course aims to:

- Identify the different cellular signaling pathways and their physiopathological and therapeutic applications, particularly their involvement in the toxic mechanisms of xenobiotics.
- Understand how signaling pathways regulate cell survival and death, and how their disruption by toxic substances or drugs can lead to immunotoxic effects.
- Explore molecular, cellular, and preclinical approaches in the discovery of new therapeutic targets, particularly in metabolic and cardiovascular diseases.

004TCEXM1	Clinical and Experimental Toxicology	2 Cr.
------------------	---	--------------

This course will provide a deeper understanding of clinical and experimental toxicology. Upon completion of this unit, students will be able to:

- Describe the toxic effects and substances affecting the liver.
- Describe the toxic effects and substances affecting the kidneys.
- Describe the toxic effects and substances affecting the central nervous system (CNS).
- Describe the toxic effects of mycotoxins.
- Describe the toxic effects of phycotoxins.

004SBLGS3	Clinical Biochemistry	3 Cr.
------------------	------------------------------	--------------

This course enables students to:

- Evaluate physiological and pathological biochemical parameters, including metabolic regulation (carbohydrates, lipids, proteins), liver and kidney function, electrolyte and calcium balance, and blood gases.
- Identify normal biochemical values, physiological variations, and major abnormalities.
- Select and apply biochemical assays, recognize interferences, interpret results, assess key biomarkers (including cardiac and tumor markers), and provide clinical-biological guidance for diagnosis and prevention.
- Understand major diseases, their risk factors, and diagnostic approaches (biochemical, biological, and molecular), including metabolic, cardiovascular, hepatic, renal, oncological disorders, and electrolyte and acid-base imbalances.

004STBCS4	Clinical Biology Internship + Report + Validation	6 Cr.
------------------	--	--------------

This internship provides students with hands-on experience in clinical biology, familiarizing them with various biological tests and their interpretation in clinical laboratories.

004PHACS5	Clinical Pharmacy AD I	3 Cr.
------------------	-------------------------------	--------------

This course equips students with essential knowledge in various clinical areas, including oncology, pulmonology, gastroenterology, dermatology, allergology, ophthalmology, and nephrology. Students will learn about international treatment guidelines and will be able to evaluate pharmacotherapy regarding appropriate treatments, potential side effects, strategies to minimize them, possible drug interactions, and dosage adjustments. This course aims to establish a Pharmaceutical Care Plan (PCP) for individual patients in both hospital and community settings, emphasizing that the pharmacist's approach should remain consistent regardless of the environment. This course also aims to ensure the provision of high-quality pharmaceutical care within a hospital setting.

004PHCCS6	Clinical Pharmacy AD II	3 Cr.
------------------	--------------------------------	--------------

This clinical pharmacy AD II course focuses on the main cardiovascular diseases. It aims to train students to optimize medication management by providing the essential knowledge needed to understand pathophysiological and etiological mechanisms, clinical manifestations, and diagnostic tools. It also covers therapeutic management principles based on the latest international guidelines, helping students apply appropriate treatment strategies to improve patient care.

004PECLS3	Clinical Pharmacy I	3 Cr.
------------------	----------------------------	--------------

This clinical pharmacy course focuses on the major neurological and psychiatric disorders. It aims to train students in optimizing patient medication management by providing them with the knowledge necessary to understand the pathophysiological and etiological mechanisms, clinical manifestations, and diagnostic tools associated with these conditions.

The course also addresses the principles of therapeutic management based on the most recent international treatment guidelines that inform the selection of therapeutic strategies. This enables students to understand the foundations of clinical reasoning as applied to the optimization of pharmacological care and the effective medication management of patients.

004TEQES4	Clinical Pharmacy II	3 Cr.
------------------	-----------------------------	--------------

By the end of this course, the student will be able to:

For the Clinical Antibiotic Therapy component:

Systematically analyze an infectious clinical situation and design, justify, and optimize an appropriate antibiotic therapy by critically integrating:

- Microbiological data (suspected or identified pathogens, interpretation of antimicrobial susceptibility testing, local epidemiology),
 - Pharmacological principles (mechanisms of action, spectrum of activity, pharmacokinetics/pharmacodynamics, safety profiles),
 - Clinical parameters (site and severity of infection, patient characteristics such as age, comorbidities, renal/hepatic function, and immune status),
 - within a rigorous antimicrobial stewardship approach based on clinical guidelines and evidence-based practice.
- The student will also be able to:
- Reassess and adapt treatment according to clinical evolution and microbiological results (de-escalation or escalation),
 - Individualize therapeutic regimens (drug selection, dose, route of administration, and duration) according to PK/PD principles and patient-specific characteristics,
 - Integrate antimicrobial stewardship principles to limit the emergence of bacterial resistance and improve quality of care.

Finally, this course aims to train students to actively contribute to therapeutic decision-making in infectious diseases and to ensure the safe, effective, and responsible use of antibiotics in both hospital and community pharmacy practice.

For the Gastroenterology, Nephrology, and Pulmonology component:

Understand, analyze, and participate in the therapeutic management of major digestive, respiratory, and renal diseases by integrating pathophysiological, clinical, and pharmacological data;

Apply this knowledge in order to support appropriate therapeutic decision-making, ensure medication safety, and optimize clinical outcomes for patients in both hospital and community pharmacy practice.

004COME1	Communication and Research Methodology	3 Cr.
-----------------	---	--------------

This course is a compulsory course given to first-year Pharmacy students. At the end of this course, the student will be able to:

- Identify the principles and applications of the different types of microscopes.
- Recognize the different types of medical imaging based on X-rays.
- Explain the principles and applications of MRI, ultrasound, and Doppler ultrasound.
- Determine the principles and applications of nuclear medicine for diagnostic or therapeutic tests. Describe the principle of flow cytometry and analyze the obtained results.
- Recognize the principles of cell culture.
- Recognize the principles of the Western blot technique.
- Describe the production of monoclonal antibodies and their current applications in diagnostics and therapeutics.

004COMUS2	Communication I	2 Cr.
------------------	------------------------	--------------

This course develops the interpersonal communication skills essential to effective professional and personal relationships. It addresses common communication challenges, including misunderstandings, conflict, ineffective listening, and misinterpretation, and explores the principles of active listening, emotional awareness, clear communication, and adapting communication to different audiences and situations. Students will learn to identify their communication styles, recognize their strengths and areas for improvement, apply practical communication strategies in everyday situations, and build confidence in their professional and personal interactions.

004COMMS5	Communication II	3 Cr.
------------------	-------------------------	--------------

This course introduces students to professional career development.

By the end of this course, students will be able to:

- Understand human resources (HR) policies.
- Comprehend the evolution of HR management.
- Utilize HR management tools effectively.
- Recognize their role as transformation leaders.
- Conduct a realistic assessment of necessary leadership skills.
- Identify and define their personal leadership style.
- Foster collaboration within their future teams.
- Enhance their leadership performance.
- Understand themselves better as leaders.
- Position themselves according to their dominant leadership style.
- Cultivate the qualities of a motivated and motivating leader.
- Manage their emotions and those of others effectively.

004EXPCI1	Communication Skills	3 Cr.
------------------	-----------------------------	--------------

This course enhances the skills needed to effectively receive, analyze, and convey information. It focuses on mastering appropriate techniques, improving linguistic and methodological competencies, and empowering students to communicate effectively while strengthening their personal and professional image.

004FONII2	Computer Science	2 Cr.
------------------	-------------------------	--------------

This course provides a foundational component of the training of a pharmacist. It is delivered to first-year Pharmacy students and is a compulsory course.

It contributes to the development of the following competencies:

- Provide pharmaceutical care in a community pharmacy and dispense medicines and health products.
- Manage a community pharmacy.
- Provide pharmaceutical care within a hospital setting.
- Contribute to the development of pharmaceutical products (production, marketing, and quality control).
- Participate in the advancement of research in the pharmaceutical field, as well as in innovation and entrepreneurship.

004EVENI2	Creativity in Sustainable Development	2 Cr.
------------------	--	--------------

This course introduces the principles of sustainable development and explores their applications in the field of health, with particular emphasis on contemporary crises. It highlights the complex interactions between environmental and health systems and encourages students to critically assess emerging global challenges. Through an interactive, conference-style format combining lectures, case studies, debates, and group work, students will develop analytical skills and the capacity to design innovative responses to complex problems. Special focus is given to crisis contexts, including armed conflicts, to deepen understanding of environmental and health issues under conditions of severe constraint.

004SOPRI4	Dental Care	2 Cr.
------------------	--------------------	--------------

This course aims to inform pharmacists about the most common oral and dental pathologies, as well as their treatment options, in order to help them effectively advise on oral care products and promote good oral hygiene among their patients.

004MMOIS6	Dissertation/Thesis	8 Cr.
------------------	----------------------------	--------------

This course aims to enable the student to acquire the following competencies:

- Analyze scientific literature by formulating a research question related to pharmaceutical sciences.
- Demonstrate scientific rigor, critical thinking, sound judgment, integrity, and ethical conduct.
- Write a bibliographic manuscript, with or without a practical application, related to pharmaceutical or biological sciences.

004INTES4	Drugs Interactions	2 Cr.
------------------	---------------------------	--------------

This course provides a fundamental foundation for the training of pharmacists. It is offered to fourth-year Pharmacy students and is a compulsory course.

Upon completion of this course, students will be able to:

- Analyze a prescription and identify and describe any potential drug interactions.
- Analyze a drug interaction and determine its severity.
- Inform patients about potential drug interactions.
- Explain to patients the measures that should be taken to prevent drug interactions.
- Understand the operation of pharmacovigilance systems worldwide.

004TODUS4	Emergency Toxicology	3 Cr.
------------------	-----------------------------	--------------

This course provides a fundamental basis for the training of future pharmacists. It is delivered to fourth-year Pharmacy students and is part of both the undergraduate (Bachelor's) and graduate (Master's) program.

This is a compulsory course.

Upon completion of this course, students will be able to:

- Provide patients with information regarding potential toxic effects of medications and other toxic substances.
- Analyze cases of intoxication, assess their severity, and determine the appropriate management measures.

004ENLOS4	Endocrinology	2 Cr.
------------------	----------------------	--------------

The objective of this course is to raise awareness among students of the main endocrine disorders. It begins with a general introduction addressing hormonal signaling, and is then organized by endocrine gland, covering the hypothalamic-pituitary axis, the thyroid, the adrenal glands, the gonads, as well as osteoporosis and calcium-phosphate metabolism. Each chapter includes a physiological review, the clinical presentation of major disorders, and their corresponding therapeutic approaches. Except for osteoporosis, metabolic diseases are not included in this course.

004AGI3I3	English	4 Cr.
------------------	----------------	--------------

This course enables students to:

- Communicate effectively with different audiences.
- Convey information clearly and effectively through written documents, using language and style appropriate to the type of information and the target audience.
- Communicate information orally in a clear and effective manner, using verbal and non-verbal communication techniques suited to the type of information and the intended audience, while making appropriate use of supporting materials and presentation tools.

004ETPHS3	Entrepreneurship in Pharmacy	2 Cr.
------------------	-------------------------------------	--------------

This course is designed to introduce pharmacy students to the fundamental principles of entrepreneurship as applied to the pharmaceutical and healthcare sectors. It aims to foster an innovative vision of the pharmacy profession by exploring the creation, management, and growth of entrepreneurial ventures across diverse fields, including community pharmacy, the pharmaceutical industry, biotechnology, digital health, cosmetics, medical devices, and healthcare services.

The course emphasizes the development of key competencies in innovation, leadership, project management, market analysis, business model development, and professional communication. Through case studies, practical exercises, and project-based learning, students will gain hands-on experience in identifying opportunities, designing solutions, and evaluating the feasibility of entrepreneurial initiatives. Students will also develop a concrete entrepreneurial project related, though not exclusively, to the pharmaceutical and healthcare sectors, integrating the knowledge and skills acquired throughout the course.

004PHEVI4	Experimental Pharmacy + Validation I	5 Cr.
------------------	---	--------------

This course aims to:

- Familiarize students with the practical day-to-day operation of a community pharmacy.
- Place students in realistic simulation settings to help them understand the various aspects of community pharmacy practice.
- Explore community pharmacy practice from different perspectives: scientific and pharmacological, communicational, and regulatory.
- Raise students' awareness of the various issues and challenges encountered in community pharmacy practice, so that their practical training experience can be meaningful and relevant.

004PHEXS2	Experimental Pharmacy + Validation II	5 Cr.
------------------	--	--------------

This course aims to:

- Familiarize students with the practical aspects of community pharmacy practice,
- Place students in realistic simulation settings to help them understand the various facets of community pharmacy practice,
- Approach community pharmacy practice from different perspectives: scientific and pharmacological, communicational, and regulatory,
- Raise students' awareness of the various issues and challenges encountered in community pharmacy practice, so that their practical internship experience can be meaningful and relevant.

004PAEXS4	Experimental Pharmacy + Validation III	5 Cr.
------------------	---	--------------

This course aims to:

- Familiarize students with the practical aspects of community pharmacy practice,
- Place students in realistic simulation settings to help them understand the various facets of community pharmacy practice,
- Approach community pharmacy practice from different perspectives: scientific and pharmacological, communicational, and regulatory,
- Raise students' awareness of the various issues and challenges encountered in community pharmacy practice, so that their practical internship experience can be meaningful and relevant.

004SECOS3	First Aid	2 Cr.
------------------	------------------	--------------

This course covers: History and Organization of the Red Cross. Emergency care and appropriate responses in various pathological situations.

004BALS12	Foundations of Healthy Nutrition	2 Cr.
------------------	---	--------------

This course introduces the concepts related to nutritional sciences and diet.

004BLGEI1	General Biology	3 Cr.
------------------	------------------------	--------------

This course covers comparative anatomy in vertebrates, reproduction, fertilization, and embryology, and general concepts of the living world.

It is offered to students enrolled in the first year of Pharmacy, LNUDI, and ETLAM. It aims to familiarize students with fundamental concepts in general biology, with a particular emphasis on animal biology and developmental biology.

004CHGEI1	General Chemistry	3 Cr.
------------------	--------------------------	--------------

The goal of this course is, first, to understand the structure of atoms and their architecture, and to deduce the structure and spatial orientation of simple molecules, with the aim of then understanding how molecules can react with each other. In a second stage, attention will be given to chemical reactions from both a kinetic and thermodynamic perspective. In a third stage, chemical equilibria will be addressed through two types of equilibria: acid–base equilibria and redox (oxidation–reduction) equilibria.

004PHAMS1	General Pharmacology	4 Cr.
------------------	-----------------------------	--------------

General Pharmacology is taught during the first semester of the third year of the Pharmacy program. The course aims to define and explain the fundamental concepts of general pharmacology, enabling students to acquire the knowledge necessary to understand the basic principles of pharmacokinetics and pharmacodynamics of drugs.

The course is organized into three main sections:

- Drug Development and Evaluation: This section examines the pharmacological development of drugs and describes the various stages of experimental and clinical drug research and development.
- Pharmacokinetics: This section focuses on the four fundamental processes that determine the fate of a drug in the body: absorption, distribution, biotransformation (metabolism), and elimination.
- Pharmacodynamics: This section explores drug receptors and the mechanisms of drug action within the body. It also addresses drug interactions and variations in the body's sensitivity to medications. The course is delivered through lectures supplemented by practical/tutorial sessions (TPC).

004GENE11	Genetics	3 Cr.
------------------	-----------------	--------------

This course, part of the first semester of the first year of the Pharmacy program, provides a clear introduction to the principles of clinical genetics. It familiarizes students with the fundamental concepts of human genetics and highlights their importance and applications in medical practice.

The course begins with essential concepts, including the flow of genetic information from DNA to protein, the impact of nucleotide variations on human diseases, and key scientific terminology specific to the field. It then explores the different types of genetic disorders, covering chromosomal abnormalities (cytogenetics) and monogenic diseases, along with their main modes of inheritance—autosomal dominant, autosomal recessive, and X-linked (dominant or recessive)—as well as their characteristics, specific features, and transmission risks.

Several diseases are presented from both molecular and clinical perspectives. Finally, the course addresses cancer genetics and population genetics.

004GEAMM1	Genomics and Medical Applications	2 Cr.
------------------	--	--------------

This course enables students to understand how genomics guides the development of personalized therapies, optimizes their effectiveness, and improves patient safety.

Upon completion of this course, students will be able to:

- Recognize the different methods used for sequencing genomes.
- Understand exomic, genomic, and genetic analyses in medicine and pharmacy.
- Integrate methods for analyzing and quantifying gene expression, as well as their applications in research and diagnostics.
- Understand the different transgenic animal models and their applications in the study of genes and therapeutic targets.

- Understand the applications of monoclonal antibodies, bispecific antibodies and immunotherapy in personalized medicine, particularly in the identification of therapeutic targets, the evaluation of treatment response, and the prediction of adverse effects.
- Interpret the results of genomic techniques used to analyze genetic signatures involved in treatment toxicity (toxicogenomics).

004UVESS1	Health Economics	2 Cr.
------------------	-------------------------	--------------

This course in Health Economics aims to provide pharmacy students with a thorough understanding of economic principles as applied to healthcare systems, with a particular focus on pharmaceuticals. It examines the functioning of healthcare markets, which are characterized by uncertainty, information asymmetry, and externalities, as well as the mechanisms of financing, insurance, and regulation.

Special emphasis is placed on pharmacoeconomics and health technology assessment, enabling students to analyze the value, costs, and outcomes of therapeutic interventions. The course also develops students' ability to critically interpret economic and clinical data in order to support evidence-based pharmaceutical decision-making. Finally, the course highlights the role of health policies, institutions, and innovation (particularly in digital health) in improving efficiency, equity, and access to medicines.

004SOLOI2	Health Sociology	2 Cr.
------------------	-------------------------	--------------

This course introduces students to the fundamental concepts of sociology as applied to the field of health. It aims to develop an understanding of how social, cultural, and interactional factors influence health behaviors, as well as perceptions of the body, illness, and care.

The course addresses key topics such as socialization processes, social norms, the spread of rumors, alternative medicine practices, and the interactions between healthcare professionals and patients. It enables students to develop a comprehensive understanding of the social determinants of health and their impact on pharmaceutical practice.

004HEMAS1	Hematology + Pathology + Practical Work	4 Cr.
------------------	--	--------------

This course contributes to the development of competencies in acquiring knowledge related to the study of blood components and in applying theoretical knowledge in hematology within a medical biology laboratory.

Practical Work (Laboratory Sessions):

These sessions contribute to the development of the competency: applying theoretical knowledge in hematology in a medical biology laboratory.

004CEORI4	Heterocyclic Organic Chemistry	3 Cr.
------------------	---------------------------------------	--------------

This course focuses on the chemistry of heterocyclic compounds, covering synthetic methods, reaction mechanisms, and the nomenclature of heterocycles, particularly those containing nitrogen, oxygen, and sulfur atoms. Students will be trained to design reaction schemes for the synthesis of these compounds. Additional transformations, such as aldolic cyclization reactions leading to ring formation, will also be examined.

The course further emphasizes the multistep synthesis of bioactive heterocyclic molecules, addressing practical challenges related to chemoselectivity and regioselectivity. Finally, students will learn to apply retrosynthetic analysis to the preparation of complex molecular structures while integrating the unique chemical properties of heterocycles and the associated reaction mechanisms.

004STAHS6	Hospital Internship	11 Cr.
------------------	----------------------------	---------------

This hospital internship is intended for fifth-year pharmacy students and takes place over two semesters alongside clinical pharmacy coursework.

It is carried out in several university hospitals in Beirut and includes rotations across various medical departments as well as the hospital pharmacy.

Students complete five rotations of four weeks each, covering a wide range of clinical specialties. They are supervised by clinical coordinators who monitor their progress, organize their work, and regularly discuss clinical cases. Students actively participate in pharmaceutical patient care by completing an individual care plan for each patient and developing a case using the SOAP model.



They perform medication history taking, medication reconciliation, and pharmacotherapy analysis. They also contribute to treatment monitoring, particularly antibiotic stewardship, and to patient education. The internship also includes educational activities such as case presentations and the development of therapeutic protocols. The objective is to develop clinical expertise, mastery of guidelines, and the ability to design individualized care plans.

Each rotation concludes with an assessment of the skills acquired.

004ANPHI2	Human Anatomy and Physiology I	5 Cr.
------------------	---------------------------------------	--------------

This course is delivered during the second semester of the first year of Pharmacy studies. Its aim is to provide students with fundamental knowledge of the human body, which is the central focus of their future professional practice.

The study of anatomy and physiology constitutes an essential foundation for any career in the health sciences, establishing the link between structure and function:

- Anatomy examines the form, organization, and relationships among the different parts of the body.
- Physiology focuses on how these structures function, that is, the mechanisms that sustain life. Clinical cases are incorporated when relevant to illustrate the normal functioning of the body; their purpose is explanatory rather than an end in themselves.
- General objective: To view the organism as a dynamic system composed of interdependent parts, rather than as a collection of isolated structural units.

004ANHUI3	Human Anatomy and Physiology II	4 Cr.
------------------	--	--------------

This course is delivered during the first semester of the second year of the Pharmacy program. It aims to provide students with fundamental knowledge of the human body, which is central to their future professional practice. The study of anatomy and physiology constitutes an essential foundation for all careers in the health sciences, establishing the relationship between structure and function:

Anatomy examines the form, organization, and spatial relationships of the various parts of the human body.

Physiology focuses on the functioning of these structures, namely the mechanisms that ensure the maintenance of life.

Clinical cases are incorporated to illustrate normal physiological processes. These cases serve an explanatory purpose and are not intended as ends in themselves. General Objective: To develop an understanding of the human organism as a dynamic system composed of interdependent parts, rather than as a collection of isolated structural units.

004HYDOS2	Hydrology	1 Cr.
------------------	------------------	--------------

This course aims to provide students with knowledge in public health related to water, with a focus on waterborne diseases and the preventive measures to be implemented at both individual and community levels.

004SANEI2	Hygiene	2 Cr.
------------------	----------------	--------------

This course aims to introduce first-year pharmacy students to the fundamental principles of general and pharmaceutical hygiene.

It is designed to provide essential knowledge for understanding contamination mechanisms, infection prevention methods, and key hygiene practices in pharmaceutical and healthcare settings. The course places particular emphasis on good personal, environmental, and professional hygiene practices, which are crucial for ensuring patient safety, maintaining the quality of pharmaceutical products, and protecting healthcare personnel.

004IPEAS2	Immunology + Pathology + Practical Work	4 Cr.
------------------	--	--------------

This course aims to provide students with a thorough understanding of how the immune system functions, its defense mechanisms, and the disorders that contribute to many diseases.

The objectives of this course are to:

- Understand the fundamental principles of innate and adaptive immunity.
 - Analyze the cellular and molecular mechanisms of immune responses.
 - Explain the role of the immune system in infectious, autoimmune, allergic, and cancer-related diseases.
- 

- Introduce clinical and therapeutic applications of immunology.
- Understand the main experimental techniques used in immunology.

004IELES2	Industrial Pharmacy Practical Work	1 Cr.
------------------	---	--------------

This course involves formulating medication and simulating production in industrial manufacturing workshops while applying principles of drug control from a galenic and biopharmaceutical perspective. The practical sessions consist of rotating manipulations, where students will gain hands-on experience in drug formulation and quality control. Utilizing knowledge from galenic pharmacy and chemistry, students will adhere to good laboratory and manufacturing practices. This course is essential for understanding the formulation, manufacturing, and quality control of medications, encompassing topics such as galenic pharmacy, industrial pharmacy, pharmacokinetics, and quality assurance.

494INERL3	Introduction to Occupational Therapy	2 Cr.
------------------	---	--------------

This course aims to raise awareness of common health issues in communities and their consequences. The course is structured around hands-on workshops in which students participate in fun, dynamic simulations of real-life situations. These experiences enable future pharmacists to reflect on individuals, their environments, and their daily activities to understand their interactions and impacts on quality of life. Role-playing exercises and field visits provide students with the opportunity to learn and experiment with different approaches to working with these individuals.

004TIBCM1	Innovative Therapies: From Patent to Commercialization	2 Cr.
------------------	---	--------------

The objective of this course is to enable students to understand the regulations and strategies governing the pre-launch phase of medicinal products at the international, regional, and local levels, to evaluate them, and to apply the most appropriate ones within the pharmaceutical industry. This course is part of the Master's program in Innovative Therapies and is a mandatory course.

004CHIO1	Inorganic Chemistry + Practical Work	2 Cr.
-----------------	---	--------------

This course aims to provide students with a solid foundation in inorganic chemistry, with particular emphasis on the properties of chemical elements and inorganic complexes. It focuses on developing the ability to identify and interpret the fundamental characteristics of elements, as well as to understand their chemical reactivity. Students will acquire proficiency in both systematic and conventional nomenclature, enabling them to accurately name and classify inorganic compounds according to established standards. In addition, the course introduces key contemporary topics in inorganic chemistry, including environmental chemistry, bioinorganic chemistry, and medicinal chemistry. These areas will allow students to explore current scientific challenges and applications, fostering a broader understanding of the role of inorganic chemistry in modern science. The practical application of these theoretical concepts will take place during laboratory sessions, where students will be introduced to the use of chemical laboratory equipment and instruments. They will also be trained to document and report experimental results in written form.

004SYNIS5	Integrated Synthesis	3 Cr.
------------------	-----------------------------	--------------

This course aims to develop pharmaceutical care competencies for managing both simple and complex cases encountered in hospital and community settings. Students will be required to integrate their acquired knowledge to analyze clinical cases and, depending on the situation, prepare a pharmaceutical care plan in SOAP note format for each identified problem. This should be based on evidence-based guidelines, including verification of dosages, identification of drug interactions, monitoring parameters, and provision of appropriate pharmaceutical counseling. Cases mainly cover the following areas: infectious diseases, pediatrics, cardiology, hematology, and gastroenterology. Participation may be individual or in groups of 7–8 students. Students will ensure comprehensive patient management, taking into account all medical conditions, patient profile, laboratory results, and current medications. Scientific reasoning and critical analysis should be clearly demonstrated in the presentation of pharmaceutical interventions. Students are expected to produce well-structured SOAP notes adapted to the clinical context and patient-specific characteristics.

004ENINS2	Integrated Teaching I	1 Cr.
------------------	------------------------------	--------------

This course aims to enable students to:

- Understand the fundamentals of antibiotic therapy by acquiring the scientific principles that underpin therapeutic decision-making.
- Master the major classes of antibiotics through a clear and structured overview of available therapeutic options.
- Optimize therapeutic selection by developing the ability to make appropriate, evidence-based, and patient-centered treatment decisions.

004ENITS4	Integrated Teaching II	2 Cr.
------------------	-------------------------------	--------------

This course aims to integrate the skills and knowledge acquired in pharmacology, medicinal chemistry, and pharmaceutical technology through themes that enable a cross-functional and interdisciplinary approach.

004STPHM1	Internship in Pharmaceutical Firms or Industries	4 Cr.
------------------	---	--------------

This internship enables pharmacy students to complement their theoretical training and gain concrete professional experience within the pharmaceutical industry. This includes, on the one hand, obtaining an overview of how the different departments operate and collaborate, and on the other hand understanding local regulations, the application of ethical charters, standards and good practices, as well as the specificities of the specialized department in which the student will carry out the internship.

At the end of the internship, the student will be able to:

- Understand the different professions within the sector.
- Learn to work in a team and communicate in a professional environment.
- Become familiar with professional practices, pharmaceutical regulations, and standards to ensure product compliance throughout their lifecycle, while guaranteeing consumer safety.
- Manage a project within the host specialized department by applying their knowledge.
- Interpret and analyze pharmaceutical regulations as well as the local or regional market context and dynamics.
- Anticipate legislative and/or commercial developments.

004IALII4	Introduction to Food	2 Cr.
------------------	-----------------------------	--------------

This course aims to introduce students to the main food groups and their nutritional characteristics, as well as the role of nutrients in human nutrition. The course covers the nutritional composition of certain foods, their specific features, and the effects of culinary and industrial processing on their nutritional quality. It also emphasizes the relationship between diet and health, while developing students' critical thinking regarding nutritional myths and information associated with foods and processed products.

004IMACS2	Introduction to Market Access	2 Cr.
------------------	--------------------------------------	--------------

This course enables students to:

- Understand how the pharmaceutical industry operates and the lifecycle of a medicine, from R&D to market launch
- Analyze healthcare systems on a global scale, with a particular focus on Lebanon, and identify key stakeholders and their roles
- Explore the strategic functions within the pharmaceutical industry
- Understand the role of market access in corporate strategies at both the global and local levels
- Acquire the key skills needed to interact with healthcare systems, understand payer expectations, and develop relevant value propositions
- Introduce pharmacoeconomics and the different types of economic evaluation
- Learn pharmaceutical pricing strategies, access models, and contracting mechanisms
- Develop negotiation and communication skills for engaging with healthcare system stakeholders.

004NOMPI2	Introduction to Pharmacy	3 Cr.
------------------	---------------------------------	--------------

This course provides first-year pharmacy students with the essential foundational knowledge required for their future profession and helps prepare them for their community pharmacy training placement. It introduces the stages involved in the development of a medicinal product and presents the major pharmaceutical disciplines, including pharmaceutics (galenics), pharmacology, and related fields. The course also explores the historical



contributions of major civilizations—including Ancient Egypt, Ancient Greece, Ancient Rome, the Arab and Persian world, and China—to the emergence of the pharmacy profession and the practice of medicine. In addition, it covers the fundamental principles of modern pharmaceutical legislation and ethics.

Through these topics, students will develop an understanding of the pharmacist's vital role in healthcare and are sensitized to the profession's significant impact on public health and patient well-being.

004INSPI2	Introduction to Pharmacy Internship I-II	5 Cr.
------------------	---	--------------

Introduction to Pharmacy Internship I:

- This course aims to introduce students to the pharmacy internship in order to facilitate their integration into training environments and optimize their learning outcomes. It provides the fundamental knowledge required to achieve the objectives defined in the internship program, while guiding students on the appropriate approach to adopt throughout their placement.

Introduction to Pharmacy Internship II:

- This component is designed to train students in the preparation of simple pharmaceutical formulations at the pharmacy laboratory scale. It focuses on the proper use of equipment, standard operating procedures, product packaging, and the correct recording of preparations in the prescription register in accordance with established rules and regulations. It also develops students' ability to search for and use relevant scientific and professional references.

004GESTS5	Management and Accounting	2 Cr.
------------------	----------------------------------	--------------

This course introduces students to the administrative, financial, legal, and accounting aspects of pharmacy management in preparation for professional practice. It covers the key considerations involved in acquiring a new or existing pharmacy, including the review of financial and legal documentation, audit procedures, and asset valuation. The course also addresses the management of medical and paramedical inventory and the day-to-day operations of a pharmacy.

004MARKS5	Marketing	2 Cr.
------------------	------------------	--------------

This course aims to provide students with fundamental knowledge of general marketing while developing their ability to apply these concepts to the specific field of pharmaceutical marketing.

The course covers key marketing principles, including market analysis, consumer behavior, segmentation, positioning, and the marketing mix. Particular emphasis is placed on the specific characteristics of the pharmaceutical sector, such as regulatory requirements, ethical considerations, drug promotion, and relationship management with healthcare professionals.

Through this course, students will gain a comprehensive understanding of the marketing strategies used in the pharmaceutical industry and their role in the responsible distribution of healthcare products.

004MASTI1	Mathematics and Statistics	4 Cr.
------------------	-----------------------------------	--------------

This course provides an introduction to the fundamental mathematical and statistical tools essential for pharmaceutical education. It is designed to develop students' competencies in the modeling, analysis, and interpretation of biomedical, pharmacokinetic, and experimental data, in alignment with academic and professional standards in the pharmaceutical sciences.

004MATCM1	Mechanisms of Toxicity, Carcinogenesis, and Regulation	2 Cr.
------------------	---	--------------

This course provides a more in-depth understanding of clinical and experimental toxicology. Students will be able to:

- Describe the evaluation of toxic substances in the body (toxicokinetics, biotransformations, and cellular and molecular mechanisms of toxic action).
 - Apply the principles of cell culture.
 - Identify the different toxicity studies and tests required for obtaining marketing authorization (MA) for new drugs.
 - Explain the foundations of carcinogenesis, mutagenesis, teratogenesis, and immunotoxicity.
 - Recognize the basic principles of pharmacovigilance.
 - Apply the principles for analyzing a scientific article.
- 

004BITHS1	Medical Biotechnology	2 Cr.
------------------	------------------------------	--------------

This course covers advanced knowledge in genetic engineering and biotechnology, including their pharmaceutical applications and therapeutic innovations. Key topics include gene therapy, recombinant proteins, and molecular cloning; methods for drug synthesis using genetic engineering; biosimilars and their regulatory frameworks; gene–drug interactions; regulation of gene expression; and emerging therapeutic strategies based on innovative pharmaceutical biotechnologies, such as RNA interference (RNAi).

004DRMES5	Medical Law	2 Cr.
------------------	--------------------	--------------

This course enables students to:

- Understand law and the rule of law.
- Learn the basic principles of the different branches of civil law: non-property rights, property rights, real and accessory rights, personal rights, and intellectual rights.
- Learn about the different sources of obligations.
- Acquire basic knowledge of employment contracts.

004BIOMS2	Metabolic Biochemistry	4 Cr.
------------------	-------------------------------	--------------

This course consists of two main parts. The first part covers enzymology, analyzing the mechanisms of enzyme function in biology, identifying suitable kinetic models, understanding inhibitions and activations, and their applications in pharmacy and metabolic biochemistry. The second part explores catabolic and anabolic reactions within major metabolic pathways (carbohydrates, lipids, amino acids, nucleic acids). It details the energy balance of essential metabolic pathways for humans, regulatory mechanisms, and homeostasis, along with their pathophysiological implications. This course also enables students to recognize key inborn errors of metabolism and major metabolic diseases and their causes.

004LEMII3	Microbial World	3 Cr.
------------------	------------------------	--------------

This course offers an integrated approach to the microbial world, ranging from the fundamentals of general microbiology to their applications in medical and pharmaceutical microbiology. It successively covers bacterial anatomy and physiology, microbial growth and adaptation, bacterial genetics, bacteriophages, plasmids, transposons and integrons, bacterial toxins, host–pathogen interactions, human microbiota, human infections, the development of infectious diseases, the pre-analytical phase of microbiological testing, strain characterization, and the principles of rational antibiotic therapy.

The course aims to enable students to understand microorganisms of medical importance, to appreciate their role in health and disease, to reason through the main steps of microbiological diagnosis, and to interpret—at an introductory yet rigorous level—the data required for informed decision-making. The course is enriched by interactive activities, clinical case studies, group work, a critical analysis project on scientific articles, and an integrative activity focused on applied microbiological diagnosis, in order to promote the integration of fundamental knowledge, scientific reasoning, and professional relevance.

004MOLBI3	Molecular Biology + Practical Work	4 Cr.
------------------	---	--------------

This course introduces students to the fundamentals of molecular biology, covering genetic information transmission, DNA, replication, transcription, translation, variations, mutation mechanisms, and their implications in pathologies. It addresses the tools used for gene exploration and various methods for studying these variations and genetic diagnostics, ranging from classical methods to next-generation sequencing.

004PHMBM1	Molecular Pharmacology and Biostatistics	2 Cr.
------------------	---	--------------

This course enables students enrolled in the Master 1 (M1) Research in Pharmaceutical and Biological Sciences program to:

- Recall the main statistical methods used for the analysis of clinical data.
- Understand the principles of clinical interventional studies and pharmacoepidemiologic studies.
- Critically appraise statistical methodologies and study protocols presented in scientific articles.
- Analyze survival data.

- Understand the principles of regression models.
- Understand the principles of systematic reviews and meta-analyses.
- Develop and organize a database for statistical analysis within the framework of a research study (e.g., a master's thesis).
- Use IBM SPSS to perform standard statistical analyses of data.

005TSPHL2	Nursing Care Tools	2 Cr.
------------------	---------------------------	--------------

This course aims to develop students' skills in the application of care techniques (measuring vital signs, administering infusions, changing dressings, applying bandages, collecting biological samples, and administering drugs via subcutaneous, intramuscular, intravenous, and intradermal routes) while respecting the rules of patient safety and quality of care.

004NUTRS4	Nutrition	3 Cr.
------------------	------------------	--------------

This course complements the previous modules and focuses on obesity, a chronic disease commonly encountered by community pharmacists. As healthcare advisors, pharmacists must understand this condition, especially since it is a major risk factor for chronic non-communicable diseases.

There are two main types of obesity: android and gynoid. Android obesity is particularly associated with higher risks of diabetes, hypertension, cardiovascular and cerebrovascular diseases, and certain cancers. Obesity is defined as an excess of body fat, not simply excess weight. Its study requires understanding:

- Causes of weight gain (diet vs. lack of physical activity)
- Behavior of adipose tissue
- Type of obesity
- Methods of patient assessment
- Management strategies
- Management relies on a comprehensive approach combining a hypocaloric diet, increased physical activity, and lifestyle changes.

This course provides the essential knowledge needed to effectively manage patients with obesity.

004CHIII2	Organic Chemistry I	3 Cr.
------------------	----------------------------	--------------

The aim of this course is to introduce the fundamental concepts of structure, nomenclature, stereochemistry, and reaction mechanisms, and to provide students with a sufficient command of the corresponding terminology and language related to these concepts.

Secondly, the course aims to integrate these notions into the explanation of reaction mechanisms in organic chemistry, as well as into the study of various elimination and substitution reactions.

Primary Competencies Targeted:

Acquire the fundamental knowledge required to understand and master the main reactions in organic chemistry and develop skills in organic synthesis with applications in the pharmaceutical field.

004CHORI3	Organic Chemistry II	4 Cr.
------------------	-----------------------------	--------------

This course enables students to master the nomenclature rules applied to different families of molecules (carbonyl compounds, carboxylic acids and their derivatives, amines, and aromatic compounds), as well as the preparation and reaction mechanisms of these families of molecules, including oxidation and reduction reactions.

Key competencies targeted:

- Name an organic molecule.
- Accurately describe a reaction mechanism.
- Distinguish between strong and weak nucleophiles and understand the impact of their nature on reaction mechanisms.
- Apply appropriate methodologies.
- Apply acquired knowledge in practical situations.

004CHTPI4	Organic Chemistry Practical Work	2 Cr.
------------------	---	--------------

The practical sessions of this course enable students to become familiar with modern organic synthesis techniques used for the preparation of small organic molecules for a wide range of applications, including medicinal chemistry, agrochemistry, materials science, and cosmetics.

These practical sessions also include the characterization of the synthesized molecules using modern analytical techniques such as Nuclear Magnetic Resonance (NMR), Mass Spectrometry (MS), UV and IR spectroscopy, as well as chromatographic methods, particularly Thin Layer Chromatography (TLC). Laboratory reports will include the obtained spectra, which students will be required to interpret, allowing them to apply and deepen their understanding of modern analytical techniques.

In addition, this course raises students' awareness of laboratory work planning, time management, proper maintenance of a laboratory notebook, laboratory safety, and environmental responsibility. A relevant literature review as well as a detailed experimental report will be required.

004OTMES5	Orthopedics and Medical Device Orthotics	2 Cr.
------------------	---	--------------

This course introduces students to the fundamental principles of orthopedics as applied to community pharmacy practice, with a focus on the musculoskeletal system, common traumatic and degenerative conditions, and the use of splints and orthotic devices.

It aims to develop the future pharmacist's ability to recognize common clinical situations, provide appropriate recommendations for orthopedic devices, and contribute to the management of musculoskeletal pain and injuries within the community pharmacy setting.

004UVPCS1	Over the Counter Medication (OTC)	2 Cr.
------------------	--	--------------

This course allows students to deepen their basic knowledge in the disciplines of their choice and gradually prepares them for a specific professional practice.

By the end of the course, students will be able to:

- Understand the key presentations of pathologies commonly encountered in community pharmacies and the management algorithm for these conditions, including OTC (over-the-counter) treatment options, cases that should be referred to a physician, and the role of each medication.
- Provide the best possible advice and counseling to patients.

004PAMYS1	Parasitology - Mycology + Practical Work	4 Cr.
------------------	---	--------------

This course enables students to deepen the knowledge required to understand the diagnostic approach in parasitology, mycology, and medical entomology.

004SEPAS1	Pathological Semiology	4 Cr.
------------------	-------------------------------	--------------

This is a compulsory course delivered using a comprehensive and integrative approach designed to help students: describe and discuss the major medical syndromes, explain the clinical features and complications of various diseases, acquire knowledge of therapeutic approaches and practical pharmacology relevant to disease management, recognize clinical signs, understand medical semiology, and perform physical examinations.

008PSKLL3	Personal Skills	2 Cr.
------------------	------------------------	--------------

This course highlights the needed 21st-century skills needed, with a focus on communication skills, conflict management skills, and negotiation skills.

004HIQMS5	Pharmaceutical Ethics	2 Cr.
------------------	------------------------------	--------------

This course offers an in-depth reflection on pharmaceutical practice, focusing on issues of professional confidentiality and the patient's right to information.

It explores the foundations of the healing profession through concepts of moral philosophy and bioethics, supported by the study of the Code of Ethics.

The course emphasizes the analysis of real cases encountered during internships to connect theory with practice. Above all, it helps students develop a solid ethical decision-making approach, an essential tool for analyzing complex situations and making appropriate choices in both community and hospital pharmacy settings.

004LEPHS5	Pharmaceutical Legislation	2 Cr.
------------------	-----------------------------------	--------------

This course deals with the regulation of pharmaceutical practice in Lebanon, including the requirements to become a licensed pharmacist, to establish a community pharmacy, to operate a hospital pharmacy, as well as to obtain a license for the manufacturing of a medication or for the importation of any substance falling within this category.

004PHQE14	Pharmaceutics I	2 Cr.
------------------	------------------------	--------------

This course is divided into two parts:

- Part A: Excipients, dissolution, and filtration
- Part B: Packaging

The main excipients used in pharmaceutical formulation are detailed (purified water, surfactants, and additives). Two pharmaceutical operations, dissolution and filtration, are also developed.

Regarding the section on packaging, the definition and roles of packaging are introduced, followed by a description of the three families of packaging materials (glass, polymers, and metals), highlighting their advantages and disadvantages and providing examples of their use in pharmaceutical packaging. Different closure systems are also discussed. Next, the various types of tests used for packaging control are detailed and analyzed through several examples. Finally, the standards and requirements related to packaging are presented and analyzed using different examples of packaging available on the market.

004PAGAS1	Pharmaceutics II	4 Cr.
------------------	-------------------------	--------------

This course covered the scientific and technological foundations necessary for the design, formulation, manufacturing, and quality control of pharmaceutical dosage forms.

004PHAGS3	Pharmaceutics III	4 Cr.
------------------	--------------------------	--------------

This course explores in detail “non-conventional” pharmaceutical dosage forms, along with innovative formulations and those currently under development for various routes of administration. It also covers biologically derived medicinal products, with a particular focus on human insulin and its analogues, as well as vaccines.

004SYINS1	Pharmaceutics Practical Work + Integrated Synthesis Practical Work	1 Cr.
------------------	---	--------------

This course teaches students how to prepare magistral pharmaceutical formulations at the laboratory scale. It complements the practical sessions of the “Introduction to Internship II” course undertaken during the first year. The laboratory includes the study of different pharmaceutical dosage forms, their advantages and disadvantages, their composition, and the general procedures required to successfully prepare each dosage form. Integrated Synthesis Laboratory combines several previously taught disciplines with the objective of preparing a final medicinal product through multiple stages:

- Preparation of a synthetic active pharmaceutical ingredient (API): synthesis and purification of aspirin. Assessment is based on the yield obtained and the evaluation of the student’s practical laboratory performance.
- Preparation of a naturally derived active pharmaceutical ingredient: extraction of caffeine from tea leaves. Assessment is based on the quality of the laboratory work (handling and technique) and the caffeine yield obtained.
- Study of pharmacopeial tests related to caffeine: identification and purity (quality) testing to verify whether the obtained active ingredient is suitable for the manufacture of a medicinal product. Note: These tests are discussed and explained in class following a literature review conducted by the students, but they are not performed practically in the laboratory.
- Preparation of a pharmaceutical dosage form containing aspirin and caffeine, using the Vidal as a reference to adapt the doses of each active ingredient appropriately. Assessment is based on the successful preparation of the pharmaceutical dosage form (e.g., capsules).

004PHMES2	Pharmacognosy	4 Cr.
------------------	----------------------	--------------

This course aims to introduce students to the chemical composition of medicinal plants. Plants are studied according to their chemical classifications.

Students will acquire knowledge of:

The chemical composition of plants, methods for extracting active constituents, identification tests for plant-based drugs, and purity assessment techniques.

The properties of plant constituents, their therapeutic and adverse effects, and consequently their pharmaceutical, nutritional, or industrial applications.

004PACII3	Pharmacokinetics	4 Cr.
------------------	-------------------------	--------------

This course serves as a foundation for pharmacist training and is required for second-year pharmacy Bachelor and Master students.

By the end of this course, students will be able to:

- Interpret how drugs behave in the body.
- Analyze pharmacokinetic phases (ADME).
- Identify and calculate key pharmacokinetic parameters.
- Recommend suitable drug administration routes and forms for patients.
- Develop optimal therapeutic regimens and dosages (including dose and frequency).

004SUIOS2	Pharmacy Internship III, Pharmacy Follow-up, and Report	6 Cr.
------------------	--	--------------

This course is delivered in the 3rd year of pharmacy studies. The aim of this internship is to help students consolidate their theoretical pharmaceutical knowledge, apply it in daily practice, and become familiar with prescription validation and the concept of pharmaceutical care.

This course contributes to the development of the following competencies:

- C1: Provide pharmaceutical care in a community pharmacy and dispense medicines and health products C2: Manage a pharmacy
- C5: Ensure compliance with applicable laws and regulations in the public and private sectors (Ministry of Public Health, CFE, CNSS, insurance, etc.)
- C6: Act ethically and professionally
- C8: Participate in health promotion

004SUOFI4	Pharmacy Internship II, Pharmacy Follow-up, and Report	6 Cr.
------------------	---	--------------

This course is delivered in the second year of the Pharmacy program.

The objective of this internship is to enable students to consolidate their theoretical pharmaceutical knowledge, apply it in routine professional practice, and become familiar with community pharmacy (officine) activities.

This course contributes to the development of the following competencies:

- C1: Provide pharmaceutical care within a community pharmacy and dispense medicines and health products.
- C2: Manage a pharmacy.
- C5: Ensure compliance with applicable laws and regulations in both public and private sectors (Ministry of Public Health, Public Servants' Cooperative, National Social Security Fund, insurance systems, etc.).
- C6: Demonstrate ethics and professionalism in practice. C8: Contribute to health promotion.

004SOFRI2	Pharmacy Internship I, Pharmacy Follow-up, and Report	6 Cr.
------------------	--	--------------

This is an introductory internship and a first contact with the community pharmacy practice environment. It enables students to develop practical skills and apply the knowledge taught in the Introduction to Pharmacy Internship I-II courses.

004TAGS6	Pharmacy or Industrial Internship + Validation	1 Cr.
-----------------	---	--------------

The objective of this internship is to enable pharmacy students to complement their theoretical education and gain practical professional experience within the pharmaceutical industry. It aims to provide, on the one hand, an overall understanding of how different departments operate and collaborate, and on the other hand, insight into local regulations, the application of ethical standards, good practice guidelines, and the specific characteristics of the specialized department in which the student is placed.

At the end of the internship, the student will be able to:

- Understand the different professions within the sector.
- Develop teamwork skills and communicate effectively within a professional environment.
- Become familiar with professional practices, pharmaceutical regulations, and standards to ensure product compliance throughout its lifecycle while safeguarding consumer safety.
- Manage a project within the host specialized department by applying acquired knowledge.

- Interpret and analyze pharmaceutical regulations as well as the context and dynamics of the local or regional market.
- Anticipate legislative and/or commercial developments.

Community Pharmacy Internship:

This represents the final stage of the community pharmacy internship, during which the student completes their training with a one-month comprehensive practical placement in a community (retail) pharmacy.

004PHIII1	Physics	3 Cr.
------------------	----------------	--------------

This course covers: mechanics, electricity, fluid mechanics, vibrational phenomena, optics, atomic physics, spectroscopy, and radiation technologies including lasers, X-rays, ultraviolet (UV), infrared (IR), and nuclear magnetic resonance (NMR), together with their applications in the medical field. It provides a fundamental scientific basis for the education and training of pharmacists. This course is designed for first-year pharmacy students.

004PHYTS4	Phytotherapy and Aromatherapy	2 Cr.
------------------	--------------------------------------	--------------

This course aims to define phytotherapy and to position it in relation to other disciplines within medicine and pharmacy.

It explains medicinal plants, including their origins, active parts, therapeutic properties, methods of use, side effects, drug interactions, and guidelines for use.

The objective is to apply this knowledge in pharmaceutical care for patients experiencing disorders affecting different systems of the body.

004PEVAI2	Practical Approaches in Pharmacy	2 Cr.
------------------	---	--------------

This course aims to:

- Familiarize students with the practical day-to-day reality of community pharmacy practice.
- Place students in realistic simulation scenarios to help them understand the various facets of community pharmacy practice.
- Approach community pharmacy practice from different perspectives: Scientific and pharmacological, Communicational, Regulatory, Commercial (marketing, sales, and merchandising/layout), and Organizational (inventory and supply management).
- Raise students' awareness of the various challenges encountered in community pharmacy practice, so that their practical internship experience can be meaningful and relevant.

018EPFPL2	Professional Ethics in Pharmacy	3 Cr.
------------------	--	--------------

This course explores fundamental ethical questions in a world where values and points of reference are increasingly diverse and norms are often shaped by individual convictions. It examines how individual actions can benefit both oneself and others and what it means to lead a good, fulfilling, and responsible life.

004PSYCI4	Psychology	2 Cr.
------------------	-------------------	--------------

This course familiarizes students with the field of psychology and its applications to health psychology. It is designed to help students understand the fundamental biological and psychological interactions underlying human functioning, including thoughts, behaviors, and emotions. The course also introduces key concepts in health psychology to support a better understanding of public health education and enables students to develop appropriate patient-centered approaches based on major psychological theories and models of health behavior.

004HYSAI4	Public Health	2 Cr.
------------------	----------------------	--------------

This course aims to provide students with a solid understanding of the foundations of public health, as well as the tools needed to analyze health determinants and their impact on populations. It also explores the interactions between humans and their environment, drawing on both local and global examples.

Students will develop a systems-based approach, enabling them to assess public health issues and analyze them from epidemiological, psychosocial, organizational, ethical, and economic perspectives.

004QLTEI4	Quality Assurance of Health Products	3 Cr.
------------------	---	--------------

This course is intended for second-year Pharmacy students. It provides an introduction to quality assurance of health products (medicinal products, medical devices, etc.).

The objective of this course is to familiarize pharmacy students with the terminology used in the field of quality, and to introduce and sensitize students to the principles of quality assurance in various pharmaceutical activities.

004COMES5	Regulatory and Industrial Affairs	2 Cr.
------------------	--	--------------

The objective of this course is to enable students to understand the regulatory framework governing the registration and maintenance of marketing authorizations (MAs) for medicinal products, dermo-cosmetics, food supplements, and medical devices at the international, regional, and local levels, and to apply the relevant standards and best practices (GxP, codes of ethics, etc.) within the pharmaceutical industry. This course is part of the Master's program and is a compulsory course.

Upon completion of the course, students will be able to:

- Master the pharmaceutical regulatory environment, including laws and standards, to ensure the compliance of products (medicinal products, dermo-cosmetics, food supplements, and medical devices) throughout their life cycle while safeguarding consumer safety.
- Manage technical documentation and facilitate the obtaining of marketing authorizations (MAs).
- Interpret and analyze pharmaceutical regulations.
- Anticipate legislative and regulatory developments.

004STDEM1	Research Internship (Biochemistry, Molecular Biology, Microbiology, Pharmacology, Toxicology)	4 Cr.
------------------	--	--------------

This course provides an introduction to fundamental and clinical research applied to toxicology, immunotoxicology, clinical biochemistry, molecular biology, pharmacology, and microbiology. It enables students to become familiar with key experimental techniques, including cell culture (notably the isolation of mononuclear cells by Ficoll density gradient centrifugation) and cell stimulation; DNA and RNA extraction; conventional PCR and real-time PCR; electrophoretic migration; Sanger sequencing; evaluation of the anti-inflammatory activity of a substance; and protein quantification using ELISA.

It also develops skills in analytical separation methods, including thin-layer chromatography (TLC) and gas chromatography coupled with mass spectrometry (GC-MS), the latter applied to the detection of urinary toxic substances.

In addition, students will gain an understanding of the principles of high-performance liquid chromatography (HPLC), as well as of disintegration and dissolution testing apparatus used in the quality control of pharmaceutical dosage forms.

Students will also be introduced to bioinformatics tools for sequence analysis, identification of genetic variations, and primer design. In the microbiology component, students will participate in the identification of microorganisms, the study of their antimicrobial susceptibility, and the understanding of resistance mechanisms, while also exploring molecular detection techniques and microbiome analysis. Furthermore, students will develop scientific analysis and communication skills by critically evaluating research articles in toxicology, biochemistry, pharmacology, and microbiology, and by presenting their work through posters or internship reports.

Overall, the placement aims to instill a rigorous scientific approach based on observation, critical analysis, quality assurance, traceability, biosafety, and clinical relevance, in alignment with the objectives of the Master 1 program.

004ELASI4	Risk Insurance Elements	2 Cr.
------------------	--------------------------------	--------------

This course introduces the fundamental principles of risk insurance with a focus on the pharmaceutical sector. The course explores concepts such as risk, premium, coverage, and liability, as well as insurance mechanisms tailored to healthcare professionals and pharmaceutical companies. The goal is for students to understand how insurance contributes to managing risks related to products, professional activities, potential damages, and legal liabilities.

004TEVEI4	Sales Techniques	2 Cr.
------------------	-------------------------	--------------

This course develops effective sales and communication skills for professional interactions with colleagues and business associates. Through interactive, hands-on activities, students will explore key sales and communication concepts and techniques, including body language, nonverbal cues, perception, conditioning, and active listening.



The course also examines how openness to different perspectives can strengthen communication, sales skills, and interpersonal relationships. Students will apply these skills to writing, speaking, presentations, research, and the development of professional work.

004LEGSS5	Social Legislation	2 Cr.
------------------	---------------------------	--------------

This course aims to:

- Familiarize students with the administrative structure of the National Social Security Fund, including the Board of Directors, Technical Committee, and General Secretariat.
- Explain the steps and areas of application, including the various branches and the subjects involved.
- Understand the different benefits provided by the National Social Security Fund, such as health and maternity insurance, workplace accidents and occupational diseases, family and school benefits, and end-of-service indemnities.

004MSPE51	Special Microbiology I + Practical Work	2 Cr.
------------------	--	--------------

This course provides an introduction to infectious diseases of bacterial origin in humans, whether they are exclusively human diseases or zoonoses.

This subject is offered to students enrolled in the 3rd year of the Doctor of Pharmacy program (professional doctorate).

It contributes to the development of the competency: “applying theoretical knowledge in bacteriology within a medical biology laboratory.”

At the end of this course, students will be able to:

- Perform basic microbiology techniques: direct examination and Gram staining, culture on solid and liquid media, and slide agglutination testing.
- Use biochemical test panels and biochemical tests for bacterial identification.
- Perform an antibiotic susceptibility test (antibiogram) using the agar diffusion method, interpret the results, and select effective antibiotics for the treatment of infections.

004MIBOS3	Special Microbiology II	4 Cr.
------------------	--------------------------------	--------------

This course is offered to students enrolled in the 4th year of the Doctor of Pharmacy program (Practicing doctorate). It is a mandatory course (core subject). This course provides an introduction to bacterial infectious diseases in humans, whether they are exclusively of human origin or are zoonotic infections (transmitted from animals to humans).

It contributes to the development of the following competencies:

- Recognize the different pathogenic bacteria affecting humans and the clinical signs of the infections they cause.
- Understand the principles of identifying bacteria responsible for infections and assessing their susceptibility to antibiotics.
- Recognize the different antibiotic therapies appropriate for each infection according to factors such as the site of infection, the patient's age, and other relevant considerations.
- Acquire the fundamental knowledge necessary to differentiate bacterial infections from viral infections, enabling appropriate patient counseling and guidance.

004TPMIS3	Special Microbiology Practical Work	1 Cr.
------------------	--	--------------

This course is offered to students enrolled in the 4th year of the Doctor of Pharmacy (Practicing Doctorate). It aims to develop the competency of applying theoretical knowledge in bacteriology within a medical biology laboratory. The practical instruction is not intended to train students as bacteriologists but rather to provide an overview of conventional bacteriological diagnostic methods.

Objectives:

- Perform basic microbiology techniques: direct examination, Gram staining, and culture on solid and liquid media, along with slide agglutination tests.
 - Use biochemical galleries and biochemical tests for bacterial identification.
 - Conduct an antibiogram using the diffusion method in agar, interpret results, and select effective antibiotics for treating infections.
- 

004PHLES2	Special Pharmacology	4 Cr.
------------------	-----------------------------	--------------

This course is the first part of a three-course series in special pharmacology delivered over three semesters. It provides the rational foundations and general principles of drug-based therapeutics. The course integrates the pathophysiological mechanisms of diseases with the pharmacological properties, clinical pharmacokinetics, and pharmaceutical formulations of medications used in the treatment of disorders affecting the autonomic nervous system and the central nervous system.

004PHSPS3	Special Pharmacology I	4 Cr.
------------------	-------------------------------	--------------

This course constitutes the second part of a three-course series in specialized pharmacology delivered over three semesters. It provides the rational foundations and general principles of pharmacotherapy.

The course integrates the pathophysiological mechanisms of diseases with the pharmacological properties, clinical pharmacokinetics, and pharmaceutical formulations of drugs used in the treatment of inflammatory, endocrine, and gynecological disorders.

004PHSOS4	Special Pharmacology II + Oncology	4 Cr.
------------------	---	--------------

This course covers cardiovascular pharmacology, focusing on the major cardiovascular diseases and the pharmacological management strategies used in their treatment. Emphasis is placed on the mechanisms of action, therapeutic indications, adverse effects, drug interactions, and appropriate use of cardiovascular medications. In addition, this course addresses the full range of oncology therapeutics, including conventional anticancer agents, targeted therapies, immunotherapies, and supportive treatments. Attention is given to their mechanisms of action, clinical indications, adverse effects, drug interactions, and safe and effective use. The course also highlights the latest evidence-based guidelines and current standards of care in oncology, ensuring that students are familiar with recent advances and best practices in cancer treatment.

004PHAPS3	Special Pharmacology Practical Work	1 Cr.
------------------	--	--------------

This course focuses on experimental pharmacology through virtual simulation platforms, including isolated organ models (OBSim) and the rat cardiovascular system (RatCVS). Students will apply theoretical concepts from lectures to analyze dose-response relationships, interpret the effects of agonists and antagonists, identify the receptors involved, and present their findings in the form of tables, graphs, and a structured scientific report.

004BIOMI2	Structural Biochemistry	3 Cr.
------------------	--------------------------------	--------------

This course is part of the program of the second semester of the second year of Pharmacy, as well as the first year of ETLAM. It prepares students for subsequent courses in metabolic and clinical biochemistry.

It provides the essential foundations for an in-depth understanding of the structure, molecular composition, and properties of biomolecules: carbohydrates, lipids, proteins, and nucleic acids, as well as their basic building blocks. The course is organized into five chapters. Following a general introduction to biochemistry, highlighting its importance and central role in life sciences, as well as the influence of chemical groups and three-dimensional structure on the function of biological molecules, the course successively covers carbohydrates, lipids, proteins, and nucleic acids.

For each class of molecules, the following aspects are addressed: structure, classification, physical and chemical properties, representations, derived molecules, polymers, biological roles, and their importance at the organism level.

004CHITS2	Therapeutic Chemistry I	3 Cr.
------------------	--------------------------------	--------------

This course enables students to understand:

- The structure of molecules.
- The physicochemical properties of these molecules and their pharmaceutical (galenic), kinetic, and metabolic implications.
- The properties conferred by their structure regarding their ability to interact with receptors and enzymes.
- The similarities between different molecular structures and the consequences of these similarities in terms of physiological, metabolic, kinetic, and pharmacological properties, as well as their therapeutic implications.

- The development opportunities offered by these structures and the new approaches to drug design and molecular conception.
- The synthetic pathways used to obtain these molecules.

004CHT3S3	Therapeutic Chemistry II	2 Cr.
------------------	---------------------------------	--------------

This course enables students to understand:

- The structure of molecules.
- The physicochemical properties of these molecules and their pharmaceutical, kinetic, and metabolic implications.
- The properties conferred by their structure regarding their ability to interact with receptors and enzymes.
- The similarities between different structures and the consequences of these similarities in terms of physiological, metabolic, kinetic, and pharmacological properties, as well as their therapeutic implications.
- The development opportunities offered by these structures and the new approaches to molecular design.
- The synthetic pathways used to obtain these molecules.

004TOXIS3	Toxicology	4 Cr.
------------------	-------------------	--------------

This course provides a foundational component of pharmacy training. It is delivered to fourth-year pharmacy students and is part of both the Bachelor's and Master's curriculum. It is a compulsory course. The course introduces the basic principles of toxicology.

By the end of this course, students will be able to:

- Advise patients on the potential toxic effects of medications and other toxic substances.
- Assess a case of poisoning, determine its severity, and decide on appropriate management.

004TOXXS4	Toxicology Practical Work	1 Cr.
------------------	----------------------------------	--------------

This practical course introduces students to the detection of toxic substances (drugs, illicit substances, metals, etc.) in various biological fluids and food samples. It complements the Toxicology course and is compulsory.

By the end of this course, students will be able to:

- Analyze a case of poisoning.
- Assess its severity.
- Determine the appropriate measures to be taken.

064VALEL1	USJ Values in Daily Life	2 Cr.
------------------	---------------------------------	--------------

This course introduces students to the core values of Saint Joseph University of Beirut (USJ), enabling them to integrate these values into their personal, interpersonal, and professional lives. It encourages students to critically reflect on how the values outlined in the USJ Charter can influence their behaviors, actions, and decisions in addressing the challenges of the contemporary world. It also raises awareness of global issues and ethical responsibilities, preparing students to contribute positively to society.

004VIROS4	Virology	2 Cr.
------------------	-----------------	--------------

This course enables students to:

- Identify the major human pathogenic viruses.
- Describe their structure and their interactions with host cells.
- Recognize the diseases caused by viral infections.
- Explain the mechanisms underlying viral latency and virus-induced carcinogenesis.
- Identify the diagnostic methods used for viral infections.
- Describe the strategies for prevention and control of viral diseases, including prophylaxis, treatment, and vaccination.

004WORN56	Work Ready Now	2 Cr.
------------------	-----------------------	--------------

This course aims to prepare students for the professional world by developing both soft skills and technical competencies, enabling them to confidently assume future responsibilities.

It also helps students build self-confidence, openness, and adaptability to change. The course prepares them for professional integration by guiding them in writing cover letters and résumés, developing personal branding



through social media, and identifying their values, strengths, and competencies, as well as how to effectively present them to potential employers.

Students will also be introduced to digital tools such as Canva and will develop their oral communication, verbal expression, and body language to enhance presentation and public speaking skills.

Personal Development:

- Identify personal values and interests.
- Assess personal attributes and competencies.
- Recognize learning styles and study strategies.
- Set goals, plan, and monitor progress.
- Explore the professional world through workplace immersion (introduction to work-based learning).

Communication Skills:

- Express ideas effectively and practice active listening.
- Follow and provide instructions and feedback.
- Read for information.
- Presentation techniques.
- Email etiquette.
- Teamwork and collaboration.
- Customer service skills.
- Workplace communication observation.
- Intercultural communication.

Job Search Techniques:

- Identify and apply for job opportunities (CV writing, cover letters, career portfolios).
- Prepare for and participate in job interviews.
- Conduct informational interviews.
- Present oneself professionally.

Workplace Behaviors:

- Professional attitudes and conduct.
 - Job shadowing.
 - Work-life balance.
 - Time management.
 - Demonstrating initiative in the workplace.
 - One-day observational internship
- 
- 