BACHELOR IN LIFE AND EARTH SCIENCES - BIOCHEMISTRY

Main Language of Instruction:
French ☑ English ○ Arabic ○

Campuses Where The Program Is Offered: CST- CLN- CLS

OBJECTIVES

The Bachelor in Life and Earth Sciences - Biochemistry provides a versatile education that offers an in-depth understanding of the biological and chemical processes governing life, while equipping students with strong practical skills. This program goes beyond disciplinary knowledge by integrating transversal skills such as leadership, innovation, design thinking, and entrepreneurship, thus preparing students to tackle the challenges of the current and future world. It fosters the development of analytical and problem-solving abilities, strengthens scientific communication skills, promotes the integration of domain knowledge, and encourages the practical application of acquired knowledge. Additionally, it offers opportunities for advanced studies and ensures successful integration into the professional world. This undergraduate program aims to forge competent scientists and committed leaders, ready to shape the future.

PROGRAM LEARNING OUTCOMES (COMPETENCIES)

A Bachelor in Life and Earth Sciences - Biochemistry allows graduates to develop a diverse skill set applicable to a variety of fields, from laboratory research to industry, as well as education.

By the end of this program, students will be able to:
- Communicate scientific information related to Life and Earth Sciences - Biochemistry to the general public
- Demonstrate technical expertise within a laboratory setting
- Teach Life and Earth Sciences
- Pursue advanced studies in health sciences, environmental sciences, industrial sciences, agronomy, or food science
- Participate in scientific research in the field of Life and Earth Sciences - Biochemistry

PROGRAM REQUIREMENTS

180 credits: Required courses (150 credits), Institution's elective courses (24 credits), Open elective courses (6 credits) and USJ General Education Program (32 credits - may be part of the above categories).

Fundamental Courses (174 Cr.)
Required Courses (150 Cr.)
General Chemistry I (6 Cr.). General Organization of Organisms: From Cells to Organs (6 Cr.). Mathematics I (2 Cr.). Origin and Diversity of Life (6 Cr.). Planet Earth and Environment (6 Cr.). Development of Animal and Plant Organisms (6 Cr.). Genes and Genomes (6 Cr.). Human Anatomy (2 Cr.). Mathematics II (4 Cr.). Physics for Biologists (6 Cr.). USJ Values in Daily Life (2 Cr.). Basics of Stereochemistry and Organic Chemistry (4 Cr.). Biochemistry of Macromolecules (6 Cr.). Ecology, Adaptation and Molecular Evolution (6 Cr.). Fundamental and Molecular Genetics (6 Cr.). Probability and Statistics (4 Cr.). Applied Geology (2 Cr.). Biotechnologies (4 Cr.). Communication Techniques (4 Cr.). Functional Biochemistry (2 Cr.). Fundamental and Molecular Enzymology (6 Cr.). Parasitology and Mycology (2 Cr.). Plant Physiology (4 Cr.). Advanced Cell Biology (4 Cr.). Basics of Food Toxicology (4 Cr.). English Level A (4 Cr.). Fundamental Immunology (6 Cr.). Metabolic Biochemistry (6 Cr.). Bacteriology and Virology (6 Cr.). Bioinformatics (2 Cr.). Molecular Biology (6 Cr.). Organ Physiology (6 Cr.). Paleontology, Paleoenvironments and Evolution of Hominids (4 Cr.).

Institution's Elective Courses (24 Cr.), to be chosen from the list below:
Advanced Documents and Data Management (2 Cr.). Geosciences, Resources, Environment (2 Cr.). Introduction to Forensic Sciences (2 Cr.). Biomarketing (2 Cr.). Algorithmics and Python for Biologists (4 Cr.). Nanotechnologies

(4 Cr.). Biophysics (4 Cr.). Biosafety and Biosecurity (4 Cr.). Artificial Intelligence (4 Cr.). Ethics and Health (2 Cr.). Ethics and Technology (2 Cr.). Ethics, Energy and Environment (2 Cr.). Origin of Scientific Concepts (2 Cr.). Scientific Journalism (2 Cr.). The World, Current Events, and Me (2 Cr.). Law in Everyday Life (2 Cr.). Active Citizenship: Strategy and Techniques (2 Cr.). Sustainable Development (2 Cr.). Entrepreneurship (2 Cr.). Successful Job Hunting (2 Cr.). Work Ready Now (2 Cr.). Designing Business Models (2 Cr.). Time and Money Management (2 Cr.). Sociology of Emotions (2 Cr.). Social Leadership (2 Cr.).
Exclusively at CLN: Society, Religion, and Ethics (2 Cr.). Citizen and Community Action (2 Cr.). Mediation: An Amicable Means of Conflict Resolution (2 Cr.). History of Lebanese Theater (2 Cr.). Doubt and Truth: A Critical Reading of Facts (2 Cr.). Panorama of the Lebanese Economy I (2 Cr.). Panorama of the Lebanese Economy II (2 Cr.). Political Culture (2 Cr.).
Exclusively at CLS: Corporate Culture and Ethics (2 Cr.). Volunteer and Citizen Action (2 Cr.). Non-Violent Communication (2 Cr.). Fake News (2 Cr.). Work Ready Now (4 Cr.).

Open Elective Courses (6 Cr.)

USJ General Education Program (32 Cr.)

Code	Course Name	Credits
	ENGLISH OR OTHER LANGUAGE	**4**
048ANGLL5	English Level A	4
	ARABIC	**4**
	Arabic Language and Culture	**2**
435LALML2 **or** 435LALAL2	Arabic Language and the Media **or** Arabic Language and the Arts	2
	Other Courses Taught in Arabic	**2**
048GESAL4 **or** 048EVMOL1 **or** 048TCSOL2	Basic Pre-Rescue First Aid **or** Self-Expression Through Music **or** Theater and Self-Discovery	2
	HUMANITIES	**8**
064VALEL1	USJ Values in Daily Life	2
	Ethics	**2**
048ETSBL1 **or** 048ETTPL1 **or** 048EEECL1 **or** 043STREL1 **or** 008CETHL4	Ethics and Health **or** Ethics and Technology **or** Ethics, Energy and Environment **or** Society, Religion, and Ethics (at CLN) **or** Corporate Culture and Ethics (at CLS)	2
	Civic Engagement and Citizenship	**2**

048CITBL1 **or** 048DVQCL1 **or** 048SSDCL1 **or** 358CIACL4 **or** 015ABC2L3	Active Citizenship: Strategy and Techniques **or** Law in Everyday Life **or** Sustainable Development **or** Citizen and Community Action (at CLN) **or** Volunteer and Citizen Action (at CLS)	2
	Other Humanities Courses	**2**
048JSCPL1 **or** 048MAMPL1 **or** 048OCSCL1 **or** 090MOC2F2 **or** 043HTLBL2 **or** 358DTVEL2 **or** 017CVIOF2 **or** 061FNEWL2	Scientific Journalism **or** The World, Current Events, and Me **or** Origin of Scientific Concepts **or** Mediation: An Amicable Means of Conflict Resolution (at CLN) **or** History of Lebanese Theater (at CLN) **or** Doubt and Truth: A Critical Reading of Facts (at CLN) **or** Non-Violent Communication (at CLS) **or** Fake News (at CLS)	2
	SOCIAL SCIENCES	**6**
	Professional Integration and/or Entrepreneurship	**2**
048ENTML6 **or** 048SJHPL2 **or** 048WRNBL2	Entrepreneurship **or** Successful Job Hunting **or** Work Ready Now	2
	Other Social Sciences Courses	**4**
048DBMML6 048SOLBL2 048EMIPL2 048TMMML2 358LEECL1 358PLE2L2 043CULPL1	Designing Business Models Social Leadership Sociology of Emotions Time and Money Management Panorama of the Lebanese Economy I (at CLN) Panorama of the Lebanese Economy II (at CLN) Political Culture (at CLN)	2
	Other Social Sciences Course	**4**
061WRNSL2	Work Ready Now (at CLS)	4
	QUANTITATIVE TECHNIQUES	**6**
048MTHBL1	Mathematics I	2

048MTHBL2	Mathematics II	4
	COMMUNICATION TECHNIQUES	**4**
048TCOBL4	Communication Techniques	4

SUGGESTED STUDY PLAN

Semester 1

Code	Course Name	Credits
048CSCCL1	General Chemistry I	6
048OGOBL1	General Organization of Organisms: From Cells to Organs	6
048MTHBL1	Mathematics I	2
048ODVBL1	Origin and Diversity of Life	6
048PTEBL1	Planet Earth and Environment	6
048ETSBL1 048ETTPL1 048EEECL1 043STREL1 008CETHL4 048CITBL1 048DVQCL1 048SSDCL1 358CIACL4 015ABC2L3 048JSCPL1 048MAMPL1 048OCSCL1 090MOC2F2 043HTLBL2 358DTVEL2 017CVIOF2 061FNEWL2	Institution's Elective Course, to be chosen from the following: Ethics and Health Ethics and Technology Ethics, Energy and Environment Society, Religion, and Ethics (at CLN) Corporate Culture and Ethics (at CLS) Active Citizenship: Strategy and Techniques Law in Everyday Life Sustainable Development Citizen and Community Action (at CLN) Volunteer and Citizen Action (at CLS) Scientific Journalism The World, Current Events, and Me Origin of Scientific Concepts Mediation: An Amicable Means of Conflict Resolution (at CLN) History of Lebanese Theater (at CLN) Doubt and Truth: A Critical Reading of Facts (at CLN) Non-Violent Communication (at CLS) Fake News (at CLS)	2
	Open Elective Course	2
	Total	**30**

Semester 2

Code	Course Name	Credits
048DAVBL2	Development of Animal and Plant Organisms	6
048GEGBL2	Genes and Genomes	6
048AHUBL2	Human Anatomy	2
048MTHBL2	Mathematics II	4
048PPBBL2	Physics for Biologists	6
064VALEL1	USJ Values in Daily Life	2

048ENTML6 048SJHPL2 048WRNBL2 048DBMML6 048SOLBL2 048EMIPL2 048TMMML2 358LEECL1 358PLE2L2 043CULPL1 061WRNSL2	Institution's Elective Course, to be chosen from the following: Entrepreneurship (CST + CLS) Successful Job Hunting Work Ready Now (CST + CLN) Designing Business Models Social Leadership Sociology of Emotions Time and Money Management Panorama of the Lebanese Economy I (at CLN) Panorama of the Lebanese Economy II (at CLN) Political Culture (at CLN) Work Ready Now (at CLS – 4 Cr.)	2
	Open Elective Course	2
	Total	**30**

Semester 3

Code	Course Name	Credits
048STOCL3	Basics of Stereochemistry and Organic Chemistry	4
048BMABL3	Biochemistry of Macromolecules	6
048EAEBL3	Ecology, Adaptation and Molecular Evolution	6
048GFMBL3	Fundamental and Molecular Genetics	6
048PRSCL3	Probability and Statistics	4
048BUICL1 **or** 048IFSBL4	Institution's Elective Course Advanced Documents and Data Management **or** Introduction to Forensic Sciences	2
048ETSBL1 048ETTPL1 048EEECL1 043STREL1 008CETHL4 048CITBL1 048DVQCL1 048SSDCL1 358CIACL4 015ABC2L3 048JSCPL1 048MAMPL1 048OCSCL1 090MOC2F2 043HTLBL2 358DTVEL2 017CVIOF2 061FNEWL2	Institution's Elective Course, to be chosen from the following: Ethics and Health Ethics and Technology Ethics, Energy and Environment Society, Religion, and Ethics (at CLN) Corporate Culture and Ethics (at CLS) Active Citizenship: Strategy and Techniques Law in Everyday Life Sustainable Development Citizen and Community Action (at CLN) Volunteer and Citizen Action (at CLS) Scientific Journalism The World, Current Events, and Me Origin of Scientific Concepts Mediation: An Amicable Means of Conflict Resolution (at CLN) History of Lebanese Theater (at CLN) Doubt and Truth: A Critical Reading of Facts (at CLN) Non-Violent Communication (at CLS) Fake News (at CLS)	2
	Total	**30**

Semester 4

Code	Course Name	Credits
048GEOBL4	Applied Geology	2
048BITBL4	Biotechnologies	4
048TCOBL4	Communication Techniques	4
048EFMBL4	Fundamental and Molecular Enzymology	6
048BIFBL4	Functional Biochemistry	2
048PMYBL4	Parasitology and Mycology	2
048PVEBL4	Plant Physiology	4
048GREBL3 **or** 048BMKBL4	Institution's Elective Course Geosciences, Resources, Environnement **or** Biomarketing	2
048ENTML6 048SJHPL2 048WRNBL2 048DBMML6 048SOLBL2 048EMIPL2 048TMMML2 358LEECL1 358PLE2L2 043CULPL1 061WRNSL2	Institution's Elective Course, to be chosen from the following: Entrepreneurship (CST + CLS) Successful Job Hunting Work Ready Now (CST + CLN) Designing Business Models Social Leadership Sociology of Emotions Time and Money Management Panorama of the Lebanese Economy I (at CLN) Panorama of the Lebanese Economy II (at CLN) Political Culture (at CLN) Work Ready Now (at CLS – 4 Cr.)	2
	Open Elective Course	2
	Total	**30**

Semester 5

Code	Course Name	Credits
048BCABL5	Advanced Cell Biology	4
048BTABL5	Basics of Food Toxicology	4
048ANGLL5	English Level A	4
048IMMBL5	Fundamental Immunology	6
048BCMBL5	Metabolic Biochemistry	6
048APBBL5 **or** 048NANOL5	Institution's Elective Course Algorithmics and Python for Biologists **or** Nanotechnologies	4

048ETSBL1 048ETTPL1 048EEECL1 043STREL1 008CETHL4 048CITBL1 048DVQCL1 048SSDCL1 358CIACL4 015ABC2L3 048JSCPL1 048MAMPL1 048OCSCL1 090MOC2F2 043HTLBL2 358DTVEL2 017CVIOF2 061FNEWL2	Institution's Elective Course, to be chosen from the following: Ethics and Health Ethics and Technology Ethics, Energy and Environment Society, Religion, and Ethics (at CLN) Corporate Culture and Ethics (at CLS) Active Citizenship: Strategy and Techniques Law in Everyday Life Sustainable Development Citizen and Community Action (at CLN) Volunteer and Citizen Action (at CLS) Scientific Journalism The World, Current Events, and Me Origin of Scientific Concepts Mediation: An Amicable Means of Conflict Resolution (at CLN) History of Lebanese Theater (at CLN) Doubt and Truth: A Critical Reading of Facts (at CLN) Non-Violent Communication (at CLS) Fake News (at CLS)	2
	Total	**30**

Semester 6

Code	Course Name	Credits
048BAVBL6	Bacteriology and Virology	6
048BIIBL6	Bioinformatics	2
048BIMBL6	Molecular Biology	6
048PDOBL6	Organ Physiology	6
048PPHBL6	Paleontology, Paleoenvironments and Evolution of Hominids	4
048BPHBL4 **or** 048BBCBL6 **or** 026INARL3	Institution's Elective Course Biophysics **or** Biosafety and Biosecurity **or** Artificial Intelligence	4
048ENTML6 048SJHPL2 048WRNBL2 048DBMML6 048SOLBL2 048EMIPL2 048TMMML2 358LEECL1 358PLE2L2 043CULPL1 061WRNSL2	Institution's Elective Course, to be chosen from the following: Entrepreneurship (CST + CLS) Successful Job Hunting Work Ready Now (CST + CLN) Designing Business Models Social Leadership Sociology of Emotions Time and Money Management Panorama of the Lebanese Economy I (at CLN) Panorama of the Lebanese Economy II (at CLN) Political Culture (at CLN) Work Ready Now (at CLS – 4 Cr.)	2
	Total	**30**

COURSE DESCRIPTION

048CSCCL1 General Chemistry I 6 Cr.

This course aims to provide an in-depth understanding of the basic concepts of general chemistry in aqueous solutions. By the end of this course, students will be able to grasp the principles of chemical thermodynamics, chemical equilibria between molecules and ions before studying redox reactions and chemical kinetics.

048OGOBL1 General Organization of Organisms: From Cells to Organs 6 Cr.

This course describes the constitution of living organisms within the various prokaryotic and eukaryotic kingdoms. In the animal cell biology part, a description of the content of eukaryotic and prokaryotic cells is provided, as well as the chemical composition of the cellular environment and the function of various organelles. The study of different elements of the cytoskeleton and those of the extracellular matrix is addressed before concluding this part of the course with a brief introduction to the cell cycle and the description of the levels of competence of stem cells.
In the animal histology part, all tissues of the organism are explored in terms of histogenesis, composition, structure, biological characteristics, location, different types, and function. The course also addresses the respective renewal of tissues, cellular exchanges within them, as well as the most common tissue pathologies. In the plant cell biology part, the plant cell is explored in terms of the composition and structure of the extracellular wall, the lipid bilayer, as well as the function of cytoplasmic organelles including various plastids.
In the plant histology part, the course covers the different types of plant tissues formed by primary and secondary meristems. The primary covering, secretory, fundamental, conducting tissues, as well as phellogen and conducting secondary tissues, are studied in detail.

048MTHBL1 Mathematics I 2 Cr.

This course introduces the main methodological tools necessary for the analysis and understanding of simple biological and chemical phenomena. It consists of theory without demonstrations, exercises of direct application, and then applications from various fields of biology and chemistry. Students who have completed this course will be able to describe a phenomenon using a function and study various elements of a curve: calculate limits and derivatives, and analyze the direction of variations. They will also be capable of performing the calculation of the integral of functions over an interval.

048ODVBL1 Origin and Diversity of Life 6 Cr.

This course allows students to explore the diversity of the living world: bacteria, protists, plants, fungi, and animals. This course is divided into several parts:

- The first part details the abiotic conditions of the primitive earth that favored the appearance of life, the phylogenetic classification of living organisms, and the binomial nomenclature of species.
- The second part addresses the evolution of land plants, mosses (bryophytes), ferns (pteridophytes), and gymnosperms.
- The third part explores the kingdom of fungi.
- The fourth part explores the evolution of animals from invertebrates to vertebrates.

048PTEBL1 Planet Earth and Environment 6 Cr.

This course tackles the structure of planet Earth and focuses on phenomena such as plate tectonics and volcanism. Next, it focuses on materials of the earth's crust; minerals first. Then come the different types of rocks: igneous, sedimentary, and metamorphic rocks. It aims to recognize the different formation histories of the three types of rocks. A final chapter deals with continental and oceanic sedimentation. It details the stages of soil formation, the links between parent rock, climate, and formed soil. Practical work in mapping and mineral recognition supports the course.

048DAVBL2 Development of Animal and Plant Organisms 6 Cr.

This course aims to explain the modes of reproduction as well as the different stages of development of animal and plant organisms. At the animal kingdom level, it teaches the different modes of reproduction, sexual and asexual, and the processes and modalities involved. It also presents an introduction to embryology, especially in

mammals with examples on the growth and development of certain systems, including the cardiovascular system and the nervous system. The plant part of the course focuses on flowering plants (angiosperms). In this part, we address, in detail, the classification and architecture of angiosperms, the vegetative apparatus (leaves, stems, and roots) and their adaptations to terrestrial environments, the life cycle of angiosperms (flower, pollination, fruit formation, seeds and their dispersion), form and duration of life as well as primary and secondary growth (wood formation).

048GEGBL2 Genes and Genomes 6 Cr.

This course explores the molecular basis of heredity. It covers a detailed description of the structure and the characteristics of the DNA molecule and discusses the concept of genes from a perspective that encompasses their molecular organization and the expression of hereditary information. Students will gain an understanding of both eukaryotic and prokaryotic genome organization, including genome size, chromosome structure, ploidy levels, and their relevance to species and speciation concepts. Additionally, formal genetics is discussed in relation to molecular and cellular processes such as DNA replication, cell division, and fertilization. This knowledge is essential for developing both theoretical insights and practical skills in fundamental and molecular genetics.

048AHUBL2 Human Anatomy 2 Cr.

This course takes an approach to human anatomy by region with basic concepts necessary for understanding physiological concepts. It covers concepts related to the skeletal, muscular, and vascular systems of the head, thorax, abdominal-pelvic region, and limbs. In addition, a detailed study of the anatomy of sensory organs and vital organs is discussed. With its general organization, this course is tailored to the needs of biology students to introduce them to the human body and prepare them to link healthy anatomy, physiology, and pathophysiology.

048MTHBL2 Mathematics II 4 Cr.

This course follows on from the Mathematics I course in the first semester. It presents the main methodological tools necessary for the analysis and understanding of simple biological phenomena. The course consists first of a minimum of necessary theory, without demonstrations, followed by exercises of direct application, and then illustrations and applications from various domains of biology.

048PPBBL2 Physics for Biologists 6 Cr.

This course is a cornerstone of natural sciences education, developing practical skills through problems in biomechanics, bioelectricity, and an introduction to biophysics. Practical work covers five topics (see PW content) and is conducted through rotating experiments, with students working in pairs or trios.

064VALEL1 USJ Values in Daily Life 2 Cr.

This course aims to raise students' awareness of the core values of the Saint Joseph University of Beirut (USJ) and encourage them to integrate these values into their personal, interpersonal, and professional lives. It engages them in a critical reflection on how the values outlined in the USJ Charter can influence their behaviors, actions, and decisions in addressing contemporary challenges. Students will also become aware of global issues and ethical responsibilities, preparing them to contribute positively to building a better society.

048STOCL3 Basics of Stereochemistry and Organic Chemistry 4 Cr.

This course introduces the fundamental concepts essential for understanding organic chemistry: orbital overlaps, chemical bonds, atomic orbital hybridization, resonance, thermodynamic and kinetic aspects of chemical transformations, electrophiles and nucleophiles, electron-donating and electron-withdrawing groups, acid and base strength, and the effects of solvents. Stereochemistry, which describes the spatial arrangement of molecules, is also covered. Following this, specific chapters focus on alkanes and haloalkanes, alcohols, ethers and their sulfur analogs, alkenes and alkynes, aromatic compounds, and carbonyl compounds. These chapters cover the nomenclature, structure, physicochemical properties, preparation methods, and reactivity of each compound family. Emphasis is placed on reaction mechanisms. This course includes lab sessions, allowing students to become familiar with the equipment used in organic chemistry and to apply some of the studied reactions.

048BMABL3 Biochemistry of Macromolecules 6 Cr.

This course aims to explore the structures and biochemical properties of biomolecules essential for the functioning of any living organism. Three major families are studied: carbohydrates (simple sugars, polysaccharides; reserve and structural polysaccharides; glycoconjugates), lipids (classes; structures and biological functions, behavior in water) as well as proteins (amino acids, peptides, proteins, levels of primary, secondary, tertiary, and quaternary structures). Various lab activities reinforce the theoretical part with interesting applications: Sugar chromatography, qualitative and quantitative analysis of sugars, lipids, and amino acids.

048EAEBL3 Ecology, Adaptation and Molecular Evolution 6 Cr.

This course allows students to acquire basic concepts in ecology and understand the processes and factors governing the structure and dynamics of populations, communities, and ecosystems.
The adaptation and evolution components enable students to understand the influence of ecological factors, biogeography, population dynamics, and genetics on the emergence of adaptations and evolutionary processes and on speciation.

048GFMBL3 Fundamental and Molecular Genetics 6 Cr.

The course aims to enhance students' understanding of the relationship between phenotype and genotype through the central dogma of biology, i.e. the DNA-RNA-protein pathway. It covers classical genetics, including mutant selection, identification of allelic series, and mapping, as well as the exploration of gene interactions and the application of basic molecular biology techniques to study gene function. These concepts are further reinforced through practical sessions and a literature review aimed at comprehending the genetic basis of human diseases.

048PRSCL3 Probability and Statistics 4 Cr.

This course introduces statistics as a decision tool through familiarizing students with the following: understanding and analyzing statistical data, and numerically and graphically describing data. Students will also be capable of conducting the calculus of probability and deciding between the use of parametric and non-parametric tests in order to compare the statistical mean of two populations or more.

048BUICL1 Advanced Documents and Data Management 2 Cr.

The course explains how to produce, process, exploit, and disseminate digital documents that combine data of different natures. Students will apply the newly acquired skills using common document production software (text, slideshow, spreadsheet, referencing software, chemistry drawings, online document on various media).

048GREBL3 Geosciences, Resources, Environment 2 Cr.

This course focuses on surface geology, with the fundamental disciplines necessary to acquire the ability to understand and interpret the various geological phenomena and structures that shape the Earth's surface, and the major anthropogenic risks that can affect it.

048GEOBL4 Applied Geology 2 Cr.

This course aims to apply fundamental notions to practical geology applications in relation to human activities in the economic and industrial fields, particularly those related to the investigation and exploration of essential natural and geological resources such as water resources, oil, and geomaterials.

048BITBL4 Biotechnologies 4 Cr.

This course aims to introduce students to modern biotechnology tools. After an exhaustive presentation of all cloning vectors, the focus is on how to clone and then on the different post-cloning approaches. Namely, encapsulation in lipid nanoparticles, in phages, and in viral particles infecting bacteria or eukaryotes for therapeutic purposes. The applications of gene therapy to treat certain diseases and for the development of modern vaccines will follow, ending with bioreactors and the production conditions of bioactive molecules and cells on a large scale.

048TCOBL4 Communication Techniques 4 Cr.

This course has two axes: the first provides an in-depth exploration of fundamental principles and the development of essential skills in verbal, non-verbal, and written communication, preparing students to interact professionally and impactfully in their future fields of activity.
The second axis aims to provide students with the essential skills for a successful transition to the professional world after obtaining their Bachelor in Life and Earth Sciences - Biochemistry. Students will apply the skills acquired in the first part in personal work. They will learn to individually analyze their profile, taking into account their interests, skills, and professional aspirations. They will also be able to recognize the career prospects and potential profiles resulting from their degree, while characterizing the skills and qualities required to excel in each field. An in-depth assessment of career plans associated with these prospects will be carried out, enabling students to make informed decisions. Finally, students will learn to choose a profile or career path based on their personal and professional goals, collect relevant information related to this choice, and communicate this information clearly and effectively through the creation of a scientific poster illustrating their chosen profile and an oral presentation.

048EFMBL4 Fundamental and Molecular Enzymology 6 Cr.

This course presents the various approaches to the quantitative study of proteins and enzymes: formalism corresponding to the interaction and the equilibrium between proteins and ligands. The Michaelis model, enzyme inhibition, and the effects of pH and temperature on proteins and enzymes are explored, and the Monod-Wyman-Changeux model are used to describe allosteric enzymes. This course also provides detailed information on molecular aspects of enzymatic reactions. The enzyme kinetics for several substrates and their experimental verification are well developed. The structure and composition of catalytic sites are addressed. An overview of enzyme technology as a part of enzyme engineering used today in several industries is presented at the end of this course.

048BIFBL4 Functional Biochemistry 2 Cr.

This course explains the physiology and functioning of the cell based on the role of the various cell organelles and the macromolecules that compose them. Three main aspects are addressed in this course: How the cell exchanges with its external environment, how it sets up its proteins, and how it responds to a signal. To this end, a detailed chapter on the different types of transport across the cytoplasmic membrane is provided, followed by a discussion of various applications and their physiological importance (heartbeat, muscle contraction, taste, sound, light perception, etc.). The study of protein targeting to different destinations deals in detail with all phenomena accompanying the establishment of proteins necessary for cellular function.
A chapter detailing the cellular response to different types of ligands, the different types of receptors, and the corresponding transduction signals concludes the theoretical part of the course. A practical session analyzing a scientific article allows students to apply all acquired knowledge to a single glandular model.

048PMYBL4 Parasitology and Mycology 2 Cr.

This course is divided into two sections. The Mycology section focuses on identifying and characterizing filamentous fungi that produce mycotoxins, which cause diseases in humans, animals, and plants. It examines the interactions between fungi and hosts, provides a detailed description of fungal infections in humans, animals, and plants, and addresses food contamination by mycotoxins such as Aflatoxins, Ochratoxins, Trichothecenes, and Patulin. Additionally, it explores various techniques for treating, preventing, and decontaminating major fungi and mycotoxins, and discusses diagnostic methods for detecting fungi directly and indirectly through mycotoxins.
The Parasitology section covers general epidemiological parasitology, offering detailed information on various parasitic infections. This includes the causal parasites, parasitic reservoirs, intermediate and definitive hosts, parasite morphology, epidemiological cycles, symptoms, diagnostics, prevention, prophylaxis, and treatment.

048PVEBL4 Plant Physiology 4 Cr.

This course aims to study the functioning of plant tissues and organs as well as the mechanisms governing these functions and the influence of internal and external factors. The course covers the essential physiological functions of plants such as resource acquisition (water, mineral and organic elements), growth and development, defense, and plant response to environmental stresses.

048BMKBL4 Biomarketing 2 Cr.

This course is designed to provide students with an in-depth understanding of marketing strategies in the pharmaceutical, food, cosmetic, and biotechnology sectors. Students will learn the fundamental principles of marketing, how to create and write product positioning, and how to conduct a SWOT analysis to evaluate a product's strengths, weaknesses, opportunities, and threats. The course also explains the operations of pharmaceutical firms, highlighting the specific aspects of the industry. Students will develop practical skills in identifying effective sales techniques and classifying customers according to their profiles. Through a combination of case studies, practical workshops, and in-depth analyses, this course prepares students to excel in marketing products related to biology and chemistry and to seize career opportunities in the life sciences industry.

048IFSBL4 Introduction to Forensic Sciences 2 Cr.

This course explains forensic science. It places emphasis on the role of the trace material as a clue in criminal investigations. The importance of critically evaluating the information content and the means by which it was obtained in the process of criminal cases is also discussed. Students are introduced to a range of trace types, to the scientific methodology applied to the collection, analysis and interpretation of these traces and to the analytical methods that are used in relation to case studies.

048BCABL5 Advanced Cell Biology 4 Cr.

In the first part, this course provides a detailed treatment of cell culture and various techniques used to explore cultured cells and their organelles. In the second part, after studying the cell cycle, cytoskeletal dynamics, and centrosome division, mitochondria, endoplasmic reticulum/Golgi apparatus, students will discuss the fate of a cell during its life: cell proliferation, cell division arrest, response to cell damage, aging, differentiation, stem cells, apoptosis, carcinogenesis, and metastasis, which they will address after explaining the link between the cell and its extracellular matrix.

048BTABL5 Basics of Food Toxicology 4 Cr.

This course aims to increase awareness of the health risks associated with substances in food. It involves analyzing and understanding the toxic effects, sources, and mechanisms of action of various residual pollutants and additives found in food. Additionally, the course provides a brief overview of the main industrial processes used to preserve food and extend its shelf life.

048ANGLL5 English Level A 4 Cr.

This course is designed to develop critical thinking, reading, oral and writing skills. It focuses on synthesizing sources, producing a research paper and defending it in front of an audience. Emphasis is on the analytical reading of different text types required in the disciplines as well as on synthesis from a variety of sources to produce a written text and present it orally.

048IMMBL5 Fundamental Immunology 6 Cr.

The course aims to impart essential principles of immunology to students, equipping them to comprehend and analyze the molecular and cellular responses triggered during infections. The course begins with an introductory overview of the history of immunology and the pivotal discoveries that have shaped our current understanding of the immune system. The introduction also provides a comprehensive summary of the immune system, which will be elaborated upon in subsequent chapters. Students are introduced to several techniques that utilize antibody properties and their practical applications. In practical sessions, students are guided through experimental protocols involving agglutination tests, immunoprecipitation, and ELISA tests and interpret the results obtained from these experiments.

048BCMBL5 Metabolic Biochemistry 6 Cr.

This course is structured around four axes. The first recalls the laws of bioenergy in biochemistry especially those related to metabolism. The second and third axes are devoted to catabolism and anabolism pathways, the energy characteristics of metabolic links are systematically analyzed. The fourth axis deals with the detoxification of xenobiotics and the fifth with the most common metabolic diseases.

048APBBL5 Algorithmics and Python for Biologists 4 Cr.

This course introduces Python, a programming language chosen for its readability, algorithmic simplicity, and free availability, making it ideal for students with no programming background, such as biologists. It emphasizes learning through practice, applying acquired knowledge directly to data processing in biology. Students acquire an understanding of Python syntax and program structure and learn to compile code logically to write algorithms.

048NANOL5 Nanotechnologies 4 Cr.

This course covers nanotechnologies as they are becoming increasingly present in our daily lives and represent a rapidly growing market. It aims to capitalize on the knowledge accumulated by L3 students during their scientific studies. It covers basic knowledge of nanomaterials and nanotechnologies that have or will have a significant impact in scientific, technological, economic, and even societal domains. After a general introduction to nanoscience, the course provides an overview of the main methods of nanoscale manufacturing. In particular, it demonstrates how nanotechnology tools (e.g., near-field microscopies, lithography) can be used to understand, and even transform, bio and/or organic systems at the atomic and molecular level on one hand, and to what extent the basic principles (self-assembly) of biology can be exploited to manufacture new materials and devices on the other hand. Additionally, this course discusses the potential contribution of nanomaterials in various fields such as medicine, electronics, space, biotechnology, biomedical, environmental applications, and optics. Current research topics in nanoscience are presented and discussed to understand the new properties sought at a very small scale.

048BAVBL6 Bacteriology and Virology 6 Cr.

This course is divided as follows: In the Bacteriology section, following an introduction and a historical overview, a review of the main discoveries of microorganisms completes Chapter 1. A presentation of the ultrastructure of a bacterial cell, as well as the biochemical composition and function of cellular structures, is addressed. A detailed description of the classification and distinctive characteristics of major bacterial groups is studied. The dynamics of bacterial population evolution and basic concepts of bacterial genetics will follow. The various relationships between the host and the pathogen are presented, leading to a discussion of antibiotics and their modes of action on bacterial cells.
In the Virology part, the essential data of viral infections, virus replication and virological diagnostic methods are illustrated. Also, the different mechanisms of viral infections with a systematic presentation of those that are most common are covered.

048BIIBL6 Bioinformatics 2 Cr.

This course provides a comprehensive overview of the field of bioinformatics and its constantly evolving tools. By the end of this course, students will have the essential bioinformatics skills needed to successfully conduct a research project. The first section focuses on utilizing databases such as NCBI, KEGG, EMBL, and SBI, and on the storage and organization of bibliographic and biological data. Subsequently, the second part focuses on the analysis of nucleotide and protein sequences. This includes characterizing these sequences, mRNA and CDS sequence identification, alignment, blast, primer design, identifying and extracting SNPs and InDels, and constructing phylogenetic trees. Moreover, protein domain analysis is the subject of the final section of the course. Tools such as CDART and Phyre2 enable the comparison of proteins based on their domains rather than their sequences. Finally, the last chapter illustrates the role of bioinformatics in constructing recombinant DNA. Students will be invited to use tools like Benchling.
At the end of each section, students will apply the acquired concepts through practical exercises. Their midterm evaluation and final grade will each be based on a project encompassing the various concepts learned.

048BIMBL6 Molecular Biology 6 Cr.

This course focuses specifically on gene expression and post-transcriptional modifications in prokaryotes and eukaryotes. Following an introduction covering the structure of nitrogenous bases, DNA structure, a review of restriction enzymes and DNA digestion, and an exhaustive explanation of the role of topoisomerases in prokaryotes and eukaryotes, the course progresses to discuss the various types of RNA present in the cell and their structure (mRNA, tRNA, rRNA, snRNA, snoRNA, miRNA, siRNA). A detailed description of transcription and maturation of different types of RNA, as well as the regulation of their transcription in eukaryotes and prokaryotes, is provided. The different steps of translation and the corresponding energy balance, in both eukaryotes and prokaryotes, are then covered. The various levels of gene expression regulation and the concept of epigenetics are presented,

followed by a description of different types of introns, ribozymes, and inteins. The final chapter discusses various enzymatic tools of molecular biology, which are discussed through Supervised Practical Work (TPC), including methods for RNA extraction, RT-PCR, and construction of a cDNA library.
The lab work begins with an introduction to the necessary calculations and instructions related to laboratory equipment and material preparation before initiating an experimental protocol. It then covers the preparation of competent cells and bacterial transformation using various plasmids. Verification by colony PCR of the presence of the insert follows before conducting a mini-prep. This involves extraction of plasmid DNA and digestion of the extracted DNA to create the corresponding restriction map. In parallel, students are tasked with searching for a gene sequence from GENBANK, identifying the coding region, performing WebCutter analysis, and creating restriction maps of a gene in order to compare the predicted profile with the obtained one.

048PDOBL6 Organ Physiology 6 Cr.

This course presents the fundamental principles of physiology along with the normal functioning of the human body. The various chapters cover major systems or parts of human physiology, addressing functional anatomy, general physiology reviews, different mechanisms and processes related to their physiological function, potential interactions with other systems and/or regulations, and some elements of pathophysiology. Emphasis is placed on the integrated nature of systemic physiology, considering the human organism as a set of interdependent systems under the control of synergistic homeostatic processes.
Practical work allows students to master the execution of a blood formula/count and learn how to perform and interpret ECG and blood pressure measurements.

048PPHBL6 Paleontology, Paleoenvironments and Evolution of Hominids 4 Cr.

The first part of the course, "Paleontology," consists of three sections:
General introduction to paleontology; General history of the biosphere: theories of the origin of life and the description of the biosphere during different geological eras, and major biological crises: the definition, characteristics, causes, and consequences of crises; the coupling between geological and biological events and the impact on the evolution of species.
The second part focuses on the study of paleoenvironments and the various methods used to read and reconstruct the past.
The third part concerns the evolution of hominids and the major milestones in the saga of Homo sapiens. This includes its divergence from other great apes, the adaptation of its morphology and abilities to become a hunter-gatherer, the improvement of its techniques to create and develop increasingly complex tools, the domestication of fire, the development of an elaborate language, the initiation into art, and the gradual shaping of its social organization to resemble our own.

048BBCBL6 Biosafety and Biosecurity 4 Cr.

This course aims to expand laboratory biosecurity concepts and to strike a balance between the long-known biosafety procedures and practices. It further introduces the overarching "biorisk management" approach that has resulted from careful thinking, comprehensive study of prevailing practices and recommendations, review of international norms and standards, and relevant ethical considerations.

048BPHBL4 Biophysics 4 Cr.

This course aims to introduce students to the scientific interface between multiple domains, including physics, biology, and chemistry. Several applications of physics in the realm of living organisms are supported by the concepts acquired during class sessions. Laboratory practical sessions complement the level of application required through experimental manipulations.

026INARL3 Artificial Intelligence 4 Cr.

This course aims to study artificially intelligent agents. It portrays several methods of implementing these agents: from simple reflex agents to utility-based agents as well as learning agents. It first covers greedy and A* search as well as the implementation of games through the minimax algorithm. It then introduces some basic supervised Machine Learning algorithms such as regression and classification. This course finally applies these algorithms to realistic datasets via Python implementations using libraries such as Scikit-learn, Tensorflow and Keras.

048ETSBL1 Ethics and Health 2 Cr.

This course addresses bioethics by broadening its scope to include social and collective issues. The study of clinical cases, situational analysis, and discussions help train students to better analyze and evaluate their daily lives. Research ethics are also an integral part of this course. It encourages a positive attitude of reflection, awareness, and sensitivity to the ethical dilemmas researchers may encounter in their professional lives.

048EEECL1 Ethics, Energy and Environment 2 Cr.

The course aims to introduce students to ethical choices in the context of energy use, energy production, and environmental protection. The course is structured around the following themes: Energy choices and their ethical consequences, Environmental protection and environmental rights, Social responsibility and governance, Climate change: science, ethics, and politics, Ethics of renewable energies: advantages and disadvantages, Ethics of energy consumption: individual choices and social responsibility.

048ETTPL1 Ethics and Technology 2 Cr.

This course focuses on the ethical issues related to the use of technology, such as surveillance, privacy, automation, artificial intelligence, autonomous weapons, and more. Its objective is to help students understand the ethical implications of their work and develop critical thinking about their role as scientists in society. Example topics include: definitions and key concepts in the ethics of technology; the evolution of technology and its impact on society; reflection on the values and ethical principles involved in the technological context; surveillance and privacy; ethical issues in the collection and use of personal data; ethical challenges of artificial intelligence and machine learning; ethics in the design and use of technology; debates on ethical issues related to bioelectronics, virtual reality, genetic modification technology, etc.; and the ethics of emerging disruptive technologies and their societal impact.

043STREL1 Society, Religion, and Ethics (at CLN) 2 Cr.

This course offers a dynamic for reflection and research on the relationships between evolving society and religion that can slow down or support this development, and how ethical questions can intervene and at what level. As a result, the course analyzes the relationships between the three monotheistic religions and society through themes that affect the political and civil life of citizens such as the question of secularity and secularism and questions that are corollaries to it such as that of civil marriage. Other questions tackled address the relationship between religion and the development of society: issues related to LGBTQ+, cohabitation, euthanasia and other various themes.

008CETHL4 Corporate Culture and Ethics (at CLS) 2 Cr.

This course introduces students to topics related to ethics and culture. It aims to raise awareness of the importance of ethics, its concepts and main definitions, as well as the significance of culture in its various aspects and the impact of ethical culture on business development. Examples from international companies help illustrate the influence of ethics on individual behavior, institutional and state organizations, business development through technology and innovation, creativity and marketing, quality control processes, and management.
The general objectives are to raise students' awareness of the importance of culture and ethics; understand the connection between culture and ethics; explain the impact of ethics and culture on decision-making and business development and introduce students to issues related to corruption.

048DVQCL1 Law in Everyday Life 2 Cr.

This course aims to familiarize students with the basic concepts of law, providing a pedagogical introduction to an essential but seemingly daunting subject, especially for science students. The goal is to enable these students to understand current legal issues, know their basic rights and obligations as citizens, and understand their national legal system in relation to international law. Through examples, this course helps students locate and decipher legal texts, relevant references in legislation, or international conventions. Finally, through examples, this course emphasizes the correct use of words and legal terminology.

048CITBL1 Active Citizenship: Strategy and Techniques 2 Cr.

This course is designed for students of the Faculty of Science to enable them to experience citizenship and explore various forms of civic practices in Lebanon and around the world.

048SSDCL1 Sustainable Development 2 Cr.

This course aims to introduce students to the interconnectedness between various sectors of human life, sustainable development, and the Sustainable Development Goals (SDGs) established by the United Nations. It also aims to define the role of public and private entities in implementing these goals.

358CIACL4 Citizen and Community Action (at CLN) 2 Cr.

This course is designed to enable the development of a sense of civic leadership in USJ students and provide them with the necessary skills to help them successfully accomplish their mission. Students will (1) Become familiar with the social and community context of their own environment. (2) Develop citizen leadership skills and the ability to act as a change agent. (3) Acquire tools for managing citizen engagement projects.

015ABC2L3 Volunteer and Citizen Action (at CLS) 2 Cr.

This course is part of the general education program at USJ. It aims to raise students' awareness of the importance of their involvement in civic life by providing them with the opportunity to engage in various volunteer activities. This course consists of two components: theoretical instruction and supervised practical work.

048OCSCL1 Origin of Scientific Concepts 2 Cr.

This course introduces students to the process of conducting reflexive analysis on the origins and development of scientific concepts as well as the history of scientific disciplines. It aims to develop their critical thinking skills in relation to the examination of the current connections among epistemology, science philosophy, and science history. The various epistemological currents and ideas that have influenced the development of scientific knowledge are also covered. Understanding contemporary scientific ideas in the fields of mathematics, physics, chemistry, and life sciences requires these reflective components. Science education and the stance of the scientific researcher are influenced by the epistemological analysis of the development of scientific theories.

048JSCPL1 Scientific Journalism 2 Cr.

This course is designed to teach students the basic techniques and rules governing journalistic writing. By the end of this course, students will be able to master the basic techniques of journalistic writing, assess the relevance of scientific information likely to be published (choice of information) in the general press and write a journalistic news item as well as a scientific press article.

048MAMPL1 The World, Current Events, and Me 2 Cr.

This course encourages students to think about the major issues that dominate current events and impact the country and the world. Through an analysis of the news that affects them, widely discussed news, and the news that fuels public debate, students will learn to develop their critical thinking and express their viewpoints, particularly during this period of health, economic, social, and political crises that Lebanon is experiencing.

090MOC2F2 Mediation: An Amicable Means of Conflict Resolution (at CLN) 2 Cr.

By the end of this course, students will be able to: (1) Identify the different types of conflicts. (2) Master the mediator's tools. (3) Prevent and resolve conflict situations using mediation techniques.

043HTLBL2 History of Lebanese Theater (at CLN) 2 Cr.

This course examines the evolution of Lebanese theatre, focusing on its modes of expression and the issues it addresses. It also explores the civic dimension of Lebanese theatre.

358DTVEL2 Doubt and Truth: A Critical Reading of Facts (at CLN) 2 Cr.

This course develops students' critical thinking skills, enabling them to analyze and interpret events and their surrounding contexts. It trains students to examine speeches and films through socio-philosophical frameworks, broadening their perspective and fostering deeper understanding.

017CVIOF2 Non-Violent Communication (at CLS) 2 Cr.

This course introduces Nonviolent Communication (NVC), a method developed by Marshall Rosenberg in the 1970s. It examines how thinking, self-expression, and communication influence conflict and interaction, either generating violence or facilitating understanding. The course focuses on four essential components: observation or description, feelings and emotions, identifying and expressing needs, and formulating achievable requests.

061FNEWL2 Fake News (at CLS) 2 Cr.

This course helps students understand rumors and fake news and develop critical thinking skills to evaluate information circulating on the internet.

048ENTML6 Entrepreneurship 2 Cr.

This course introduces the fundamentals of entrepreneurship in a rapidly evolving work environment, where traditional career paths are being reshaped by innovation and technology. It emphasizes the development of an entrepreneurial mindset and provides students with the education and support to explore alternative career paths beyond the traditional trajectory.

048SJHPL2 Successful Job Hunting 2 Cr.

The course introduces students to professional life and its demands in terms of personal development and technical knowledge.
It covers:

1-Responding to a job offer (application e-mail, cover letter, CV)
2-Passing a job interview (dress code; body language; how to present yourself; dos and don'ts; etc.)
3-Searching for a job offer (profile on LinkedIn; search for an offer on LinkedIn, etc.; post your CV on Monster, Bayt and Co, etc.; searching for job offers on the websites of institutions, companies, hospitals, industries, etc.)

048WRNBL2 Work Ready Now 2 Cr.

The Work Ready Now program provides young students with the essential skills and knowledge needed to find and keep a job. This program, created by Higher Education Capacity Development (HECD), was designed in a participatory and practical manner so that students are actively involved in the learning process, gaining new skills and self-confidence to secure and maintain employment. Additionally, the learning methods allow students to develop digital skills through the use of free online software.

048DBMML6 Designing Business Models 2 Cr.

This course introduces students to the fundamentals of business and how to approach business problems. It uses case studies to help students understand how and why different businesses operate across various sectors.

048TMMML2 Time and Money Management 2 Cr.

This course aims to enlighten undergraduates about the choices to be made for extraordinary productivity. Moreover, this course enables students to have a clear understanding of various means of investments in several industries comprising: stock market, life insurance, private banking, and retail banking.

048EMIPL2 Sociology of Emotions 2 Cr.

This course familiarizes students with the sociological theories of emotions, explores the impact of emotions on individual and collective decisions, and analyzes social interactions through the prism of emotions.

048SOLBL2 Social Leadership 2 Cr.

This course explores social leadership, an emotional and empathetic leadership style that emphasizes connection, collaboration, and communication. It covers how leaders cultivate trust, care, and respect within teams to foster an open and positive work environment. Students will learn to leverage emotional intelligence and interpersonal skills to influence others, rather than relying solely on position or title, enhancing effectiveness in today's workplace where employees seek meaning and purpose in their work.
By the end of this course, students will be able to:

- Identify the values and principles of social leadership.
- Develop essential skills for becoming a social leader.
- Define their purpose and guide their team on this same track.
- Understand the 9 core principles of the NET Model.
- Identify areas of strength and areas that need improvement.

358LEECL1 Panorama of the Lebanese Economy I (at CLN) 2 Cr.

This course provides an overview of fundamental economic concepts, in order to understand how the Lebanese economic crisis arose. It first introduces the political regime of "consociational democracy" to understand the roots of high levels of inequality in Lebanese society. Second, it presents the results and conclusions of the World Bank's recent work on Lebanon's economic situation. Third, it focuses on three macroeconomic variables: gross domestic product (GDP), inflation and unemployment, which are key measures of a country's economic performance.

358PLE2L2 Panorama of the Lebanese Economy II (at CLN) 2 Cr.

This course examines Lebanon's economic crisis and the conditional $3 billion IMF loan agreement of April 2022, designed to help the country address its worst economic crisis. It provides and explains several solutions as first steps toward economic reforms and recovery: tackling inequality through progressive taxation; negotiating assistance and reform packages between Lebanese authorities and the IMF; and considering full dollarization or a currency board regime to improve the quality of the national currency and ensure a definitive end to its depreciation.

043CULPL1 Political Culture (at CLN) 2 Cr.

This course covers the following topics: What is politics? What is the meaning of the term "politics"? What is the purpose of politics? What are the different political bodies? What are they for? How to define the various political regimes? What is the relationship between politics and religion?

061WRNSL2 Work Ready Now (at CLS) 4 Cr.

The Work Ready Now course provides students with the foundational "soft skills" and work-based learning experiences to prepare them for success in the workplace. Work Ready Now is designed to facilitate participatory, hands-on teaching and learning. Students will be actively engaged in the learning process and provided opportunities to practice and enhance new skills and gain the self-confidence necessary to secure and maintain work related to their professional goals. Work-based learning activities are woven into the course and require students to go to real workplaces in the community outside of class time. Students will be guided to use free online digital tools to demonstrate their learning. Throughout the course, students will create a career portfolio that will help them on their experiential Work Ready Now journey from student to employee.

048EVMOL1 Self-Expression Through Music 2 Cr.

This course engages students in selecting songs in Arabic, French, English, and Italian to develop a group project that inspires self-expression through music or original text.

048SPAOL3 Simulation of Piloting and Civil Aviation I 2 Cr.

This course provides an instructional introduction to single-engine aircraft operation using digital simulations, without claiming to be a formal pilot training program. It introduces basic concepts for using a single-engine aircraft with a fixed-pitch propeller, navigation standards across various European regions, and the use of airport

charts for takeoffs and landings. The course aims to enable students to start a training aircraft, perform proper takeoffs, navigate according to Visual Flight Rules, and prepare for a safe landing.

048TCSOL2 Theater and Self-Discovery 2 Cr.

This course is aimed at students who wish to learn acting techniques in a recreational and enjoyable setting. Sessions focus on exercises in dramatic arts such as warm-up, body expression, relaxation, trust-building games, diction exercises, voice and breathing work, mime, improvisation, body and rhythm, physical movements, motor skills, space management, and stage presence. The course aims to help students master and enhance their presence on stage and their interaction with the audience for any type of performance: lectures, seminars, etc. Practice is conducted individually and collectively on stage, combining the enjoyment and discipline of performance. The teaching approach emphasizes the body and voice as the actor's primary tools and encourages creativity in responding to scenarios and delivering text in diverse ways.

048GESAL4 Basic Pre-Rescue First Aid 2 Cr.

By the end of this course, students will be able to recognize emergency situations, identify first aid procedures, and initiate first aid care.

435LALAL2 Arabic Language and the Arts 2 Cr.

This course allows students to explore the Arabic language and its culture through various forms of art, such as painting, calligraphy, and Arabic ornamentation. It provides linguistic, oral, and written skills that are practical and tangible.

435LALML2 Arabic Language and the Media 2 Cr.

This course allows students to explore the Arabic language and its culture through various forms of media, including visual, audio, and written journalism, as well as visual, audio, and written advertising. It provides linguistic, oral, and written skills that are practical and tangible.