LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master 2 Programs

Description & Curriculum

Major: Physics & Electronics

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Master Program	STIP (Signals, Telecoms, Image and Speech)
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ■ M2 Research
Teaching Language	☐ English ☐ French ☐ Mixed - English & French
Place of Teaching (Campus)	■ Hadat ☐ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	* The M2 program STIP is a multidisciplinary program offering advanced theoretical and development skills in: **Wireless Communications, Computer vision, Machine Learning, Speech Synthesis and Recognition, Signal Acquisition and Detection, Embedded Systems.** * **Double diploma** with the master program: M2-TSI (Telecoms, Signals and Image), ULCO University, France (for students holding M1-Electronics from Lebanese University)
Program Learning Outcomes	• Solid theoretical capacities • System design expertise • Prototyping skills in the wide areas of Communications and Signal Processing
Fields of Work	• PhD programs • Research & Development in the private sector and research centers • Teaching positions / research assistantship in Universities
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ■ Electronics ☐ Physics
Coordinator of Master Program	Pr. Oussama BAZZI *Contact information:* UL Email address: obazzi@ul.edu.lb Alternative email: Phone number (*optional*): +961- 03-299280

Research Master - M2
Signal, Telecommunications, Image and Speech (STIP)
2024-2025

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester 3	STIP 500	Random signal processing	3	24
	STIP 501	Time-frequency and wavelets	3	24
	STIP 502	Image processing and pattern recognition	4	24
	STIP 503	Speech processing	3	24
	STIP 504	Detection and Estimation	3	24
	STIP 505	Information theory for Telecoms	3	24
	STIP 506	Advanced Digital communications	3	24
	STIP 507	Processors for Signal and Images	3	24
	STIP 508	Advanced Signal Processing, Algorithmics	3	24
	RMSE 500	Research Methodology and Scientific English	2	24
	Total		**30**	**240**

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester 4	STIP 580	**Research Internship**	30	
	Total		**30**	

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	Microwave
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☐ English ☐ French ☒ Mixed - English & French
Place of Teaching (Campus)	☒ Hadat ☐ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	The microwave technology application has benefited mankind in many ways. Worldwide communications over the microwave links, both terrestrial and satellite based, are common-place. Technologies that started out in expensive military and commercial systems have filtered down to affordable items for the individual consumer, starting with microwave oven to the cellular telephone. And from the design engineer's side, our ability to model, design, build, and test practical microwave hardware has advanced incredibly, moving from hand drawn Smith charts to the common place personal computer. We are also progressing outward in the frequency spectrum. We have always been pushing to make use of higher frequencies. Now we are also moving lower to meet the upward shift in the traditional RF world. Designers in the digital world came to understand they need to learn our secrets as clock frequencies continue to increase. All of these aspects will be covered in this newly established master program
Program Learning Outcomes	• A good foundation in the fundamental concepts and theory of microwave engineering • Ability to explore the world of Electromagnetic practical applications • An insight into current trends and development of the field of EM. • Deep dive for practical experience in system, circuit, device and chip level design, analysis and simulation.
Fields of Work	• design, development, maintenance and testing of RF and microwave components and systems. • 5G and 6G Wireless communication technology and satellite communication systems • Remote sensing RADARs and medical equipment • Products Electromagnetic compatibility and Immunity testing. • Research and development position to improve existing technologies
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☒ Electronics ☒ Physics ☒ Hydrodynamics ☒ Electrical Engineering ☒ Communication Engineering ☒ Material Sciences
Coordinator of Master Program	Dr.-Ing. Hussam Ayad *Contact information:* UL Email address: hayad@ul.edu.lb Alternative email: xxx@xxx.com Phone number (*optional*): +961- 76 - 764116

Research Master - M2
Microwave
2024-2025

Semester 3	Course			
	Code	**Title**	**Credits**	**Hours**
	MCRO 500	Microwave Semiconductor Devices	3	24
	MCRO 501	Radio navigation & location	3	24
	MCRO 502	Linear and Non-Linear Microwave Circuits	4	32
	MCRO 505	Electromagnetic Compatibility	3	24
	MCRO 509	Advanced Electromagnetics	3	24
	MCRO 510	Antennas & Propagation	4	32
	MCRO 511	Computational Methods in Electromagnetics	4	32
	MCRO 512	Microwave Circuit Design	4	32
	RMSE 500	Research Methodology and Scientific English	2	24
	Total		**30**	**248**

Semester 4	Course			
	Code	**Title**	**Credits**	**Hours**
	MCRO 580	**Training**	30	
	Total		**30**	

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	**Condensed Matter Physics** ***(Double Master 2 Diploma NOA - Le Mans University – France)***
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☒ English ☐ French ☐ Mixed - English & French
Place of Teaching (Campus)	☒ Hadat ☐ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	The Condensed matter Physics (PMC) is to provide a focus on the physics of condensed matter and their applications in various scientific fields: the use of advanced techniques for the investigation of the matter by electronic microscopy, atomic tomography, X-ray diffraction, optical and Mossbauer spectroscopy, thermal analysis, magnetic analysis and theoretical modeling and numerical simulation.
Program Learning Outcomes	• excellent computational skill • independent researcher
Fields of Work	• Doctoral thesis • Researcher • Research Engineer
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☐ Electronics ☒ Physics ☐ Please add other accepted majors if applicable
Coordinator of Master Program	Pr. Abbas HIJAZI *Contact information:* UL Email address: abhijaz@ul.edu.lb Alternative email: abbashijazi@yahoo.com Phone number (*optional*): +961- 03 - 760214

Research Master - M2
Condensed Matter Physics
2024-2025

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester 3	**Common Courses**			
	Phys 501	N-Body Problem	3	24
	Phys 502	Non-Equilibrium statistical Physics and Critical Phenomena	3	24
	RMSE 500	Research Methodology and Scientific English	2	24
	Condensed Matter			
	Phys 500	Modeling and Event Simulation	5	40
	PHMC 500	Density Functional Theory (DFT)	3	24
	PHMC 501	Introduction to Nanophysics	3	24
	PHMC 502	Nanomagnetism Condensed Matter Physics of surfaces and interfaces	5	40
	PHMC 503	Spectrometry Optics of complex media	3	24
	PHMC 504	Numerical Methods in Physics	3	24
	Total		**30**	**248**

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester 4	PHMC 580	**Master Thesis**	30	
	Total		**30**	

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	Subatomic Physics
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☒ English ☐ French ☐ Mixed - English & French
Place of Teaching (Campus)	☐ Hadat ☐ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	The "Subatomic Master" program provides an in-depth study of both theoretical and experimental physics. The curriculum includes gauge theory, field theory, the standard model, general relativity, many-body physics, nuclear models, particle detectors, and other relevant topics. In addition to traditional subjects, the program features seminars on the emerging role of consciousness in quantum decoherence and its impact on the quantum-to-classical transition. Students also explore the evolving roles of artificial intelligence and game development in theoretical physics, highlighting innovative approaches to problem-solving and simulation.
Program Learning Outcomes	1. **Advanced Theoretical Knowledge**: o Demonstrate a comprehensive understanding of gauge theory, field theory, the standard model, and general relativity. o Explain and analyze the principles of many-body physics and nuclear models. 2. **Experimental Skills**: o Develop proficiency in the use and understanding of particle detectors. o Apply experimental techniques to investigate subatomic particles and phenomena.
Fields of Work	Completing the "Subatomic Master" program opens up diverse career options. You could become a scientist, conducting research in particle physics, or a teacher, sharing your passion for physics with others. You might also work in technology, developing innovative solutions. With your knowledge and skills, there are many exciting paths to explore
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☐ Electronics ☒ Physics ☐ Please add other accepted majors if applicable
Coordinator of Master Program	Pr. Salah Hamieh *Contact information:* UL Email address: shamieh@ul.edu.lb Alternative email: hamiehs@yahoo.fr Phone number (*optional*): +961- 70 - 705442

Research Master - M2
Subatomic physics
2024-2025

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester 3	**Common Courses**			
	Phys 501	N-Body Problem	3	24
	Phys 502	Non-Equilibrium statistical Physics and Critical Phenomena	3	24
	RMSE 500	Research Methodology and Scientific English	2	24
	Option : Subatomic physics			
	PHTH 500	Gauge theories, abelian and non-abelian	5	40
	PHTH 501	Standard model and beyond standard model	3	24
	PHTH 502	Nuclear Model	3	24
	PHTH 503	Detector Physics	3	24
	PHTH 505	Data analysis and events simulation	3	24
	PHTH 506	Cosmology and Astroparticles	5	40
	Total		**30**	**248**

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester4	PHTH 580	**Master Thesis**	30	
	Total		**30**	

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN'S OFFICE

Master Programs

Master Program	Medical Physics and Life Imaging
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☐ English ☐ French ☒ Mixed - English & French
Place of Teaching (Campus)	☒ Hadat ☐ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	Medical physics is an interdisciplinary science involving the principles and tools of physics and engineering in medicine for diagnostic and therapeutic purposes; particularly in ionizing radiation dosimetry, instrumentation, imaging, modeling, and radiation protection. This program aims to initiate research and train scientific experts in medical physics and imaging at different scales from molecules to humans by providing solid multidisciplinary training. It allows students to acquire a broad spectrum of skills necessary in imaging (X-rays, γ, MRI, ultrasound, photonics, etc.) and medical physics to respond to the problems posed in this vast field and to provide the necessary solutions.
Program Learning Outcomes	– Understand the basic and advanced concepts and practical methods of the physics of ionizing radiation, physical dosimetry, nuclear medicine, radioprotection, and radiography. – Knowledge of the operation of imaging and radiotherapy equipment, technology, and associated risk management. – Basic knowledge of methodologies for biomedical research and abiding by norms and regulations. – Animating and handling of a research project ensuring conception and innovation in the medical technology domain.
Fields of Work	– Pursue a PhD program with a partner university for a research and/or education career. – Work as a specialized physicist in medical radiation (radiation physicists) responsible for optimizing the uses of radiation in diagnosis and therapy in terms of quantity, efficiency, and patient radiological protection. – Work as a specialist in a hospital in the imaging department. – Working as a technical framework assuming control of choice and use of imaging devices parks, nuclear medicine, and radiotherapy. – Working as a technical framework assuming control of choice and use of imaging, nuclear medicine, and radiotherapy devices.
Admission Requirements	***GPA:*** Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University ***Major:*** ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☒ Electronics ☒ Physics ☒ Biomedical Engineering, Biomedical Physics and related fields
Coordinator of Master Program	**Pr. Jamal Charara** ***Contact information:*** UL Email address: jcharara@ul.edu.lb Alternative email: xxxx@xxx.com Phone number (***optional***): +961- xx - xxxxxx

Research Master - M2
Medical Physics and Life Imaging
2024-2025

	Course					
	Code	**Title**	**Credits**	**Course**	**Lab**	**Nb. of hours**
Semester 3	PMIV 502	Radiotherapy - Radiobiology - Radioprotection	5	40		40
	PMIV 503	Dosimetry - Detectors - Production	4	32		32
	PMIV 504	Applications in Medical Imaging	3	24		24
	PMIV 505	Image - Signal in Imaging	4	32		32
	PMIV 506	Image Reconstruction and Simulation	4	32		32
	PMIV 507	Hospital Information Systems	3	24		24
	PMIV 508	Medical devices and conformity, regulation and quality	3	24		24
	PMIV 509	Medical Physics Lab	2		36	36
	RMSE 500	Research Methodology and Scientific English	2	24		24
	Total		**30**	**232**	**36**	**268**

	Course					
	Code	**Title**	**Credits**	**Course**	**Lab**	**Nb. of hours**
Semester 4	PMIV 580	**Master Thesis**	30			
	Total		**30**			

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	Title: Laser Optique Matière – Laser Optical Material
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☐ English ☐ French ☒ Mixed - English & French
Place of Teaching (Campus)	☐ Hadat ☒ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	OBJECTIVES: The Master 2 "Laser Optical Material" (LAOMT) signed a cooperation agreement of double Master's degree with the Master 2 "Photonics, Complex and Quantum Systems (PhoCQS)" at Lille University-France. The Cursus offers advanced training in the fields of lasers, photonics, optics, integrated optics and Optical Fiber, Photosensitive Materials, optical properties of solids, application of AI to the challenges of ab initio calculations. As a LAOMT graduate, you will have a deep knowledge of how to generate, manipulate and guide various types of light, the interaction between light and material, how do design laser sources. You will have also a deep knowledge in the fields of Optics, quantum optics, photonics, integrated optics. The cursus is taught in French. The academic training is completed by an internship in a research lab specialized in Optics, photonics or lasers and also in the field of Materials.
Program Learning Outcomes	Integrated optics - optical fibers, Interaction between photons and atoms, Quantum well-based Semiconductor lasers, Multiphotonics, Laser Dynamics, Imaging, tomography and coherent optical microscopy, Optical properties of solids, Photosensitive materials via laser writing, Applications of Artificial Intelligence to the challenges of ab initio calculations, Nanophotonics and mesoscopic optics, Quantum Optics, Research methodology and Scientific English.
Fields of Work	The cursus is a research option that prepares to a PhD and a career in the research and academic sector. However, it is also possible to work as research engineer in the field of laser, optics and photonics in the industrial sector.
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☐ Electronics ☒ Physics ☐ Please add other accepted majors if applicable
Coordinator of Master Program	Pr. Jihane Jabbour *Contact information:* UL Email address: jihane.jabbour@ul.edu.lb Alternative email: jihanejabbour@hotmail.com Phone number (*optional*): +961- 70- 098 158

Research Master - M2
Laser Optical Material
2024- 2025

	Course					
	Code	**Title**	**Credits**	**C**	**TS**	**Hours**
Semester 3	LAMT 503	Integrated optics-optical fibers	3	24	8	32
	LAMT 504	Interaction between photons and atoms	3	16	14	30
	LAMT 507	Quantum well-based Semiconductor lasers	2	16		16
	LAMT 508	Multiphotonics	2	16		16
	LAMT 511	Lasers Dynamics	4	24	12	36
	LAMT 512	Imaging, tomography and coherent optical microscopy	2	16	6	22
	LAMT 517	Optical properties of solids	2	16		16
	LAMT 520	Nanophotonics and mesoscopic optics	2	16		16
	LAMT 521	Quantum Optics	3	24		24
	LAMT 522	Photosensitive materials via laser writing	3	12	12	24
	LAMT 523	Applications of Artificial Intelligence to the challenges of ab initio calculations	2	24		24
	RMSE 500	Research Methodology and Scientific English	2	24		24
	Total		**30**	**228**	**52**	**280**

	Course					
	Code	**Title**	**Credits**	**C**	**TS**	**Hours**
Semester 4	LAMT 580	**Research Internship**	30			
	Total		**30**			

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	Nanosciences and Functional Materials
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☐ English ☐ French ☒ Mixed - English & French
Place of Teaching (Campus)	☐ Hadat ☒ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	The Master involves acquiring knowledge in growth and characterization of materials to master the development and properties of nanomaterials and functional materials (nanoparticles, bulk, thin layers, organic-inorganic materials, oxides, polycrystalline, carbon nanotubes, graphene...), with a view to applications in nanotechnology and nanoscience, as well as in power electronics and photovoltaics. More precisely, the objective is to bring students, at the end of the program, to a good mastery of the development and physical processes of crystal growth and advanced characterization of materials used in modern technology. This is a research Master so I will help you find a PhD easily, however the technological aspect and the hands on nature of the research will allow you to join research technological compagnies later on
Program Learning Outcomes	• to master the theoretical concepts of nanosciences and functional materials • to use and master the range of materials growth and characterization techniques • to establish relationships between the structure of the material and its properties in order to optimize its performance and use in advanced technology • to manage a project, to guide technological choices in leading industry
Fields of Work	PhD in materials science and related materials Research and development position for technological compagnies
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☐ Electronics ☒ Physics ☒ Physical Chemistry
Coordinator of Master Program	Pr. Ziad HERRO *Contact information:* UL Email address: ziad.herro@ul.edu.lb Alternative email: ziadherro@gmail.com Phone number (*optional*): +961- xx - xxxxxx

Research Master - M2
Nanosciences and Functional Materials
2024-2025

	Course						
	Code	**Title**	**Credits**	**C**	**TS**	**LS**	**Hours**
Semester 3	NMTF 500	Growth and characterization of bulk crystals and thin films	4	32			32
	NMTF 501	Hybrid materials and sol-gel process	3	24			24
	NMTF 512	Spectroscopic techniques and approaches to nanomaterials	3	24			24
	NMTF 519	Renewable energy	3	24			24
	NMTF 522	Nanomaterials and nanocomposites	2	16	4		20
	NMTF 523	Electronic Structure of molecules : ab initio methods and spectral analysis	3	16		15	31
	NMTF 524	Numerical Methods for Physics	4	31			31
	NMTF 525	Nanophysique et puits quantiques	3	24			24
	NMTF 526	Matériaux carbonés	3	24			24
	RMSE 500	Research Methodology and Scientific English	2	24			24
	Total		30	239	4	15	258

	Course						
	Code	**Title**	**Credits**	**C**	**TS**	**LS**	**Hours**
Semester 4	NMTF 580	**Master Thesis**	30				
	Total		**30**				

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Master Program	Physics of Radiation-Matter Interaction (PIRM)
Master Type	☐ M1+ M2 Professional ☐ M2 Professional ☒ M2 Research
Teaching Language	☐ English ☒ French ☐ Mixed - English & French
Place of Teaching (Campus)	☐ Hadat ☐ Fanar ☒ Tripoli ☐ Nabatieh
About the Program	The PIRM (Physics of Interaction Radiation and Matter) research master's program provides an advanced, selective education for physics students, focusing on light-matter interaction phenomena. It prepares students for research in fundamental and applied physics. Covering topics like quantum electrodynamics, molecular spectroscopy, and plasma physics, the program combines theoretical knowledge with experimental techniques, producing highly skilled scientists.
Program Learning Outcomes	• Analytical Abilities. • Theoretical Proficiency and Experimental Techniques. • Interdisciplinary Knowledge. • Communication Skills, Independent and Collaborative Work.
Fields of Work	• Research and Development : Academic Research, National and international Laboratories: Working on large-scale projects related to nuclear physics, particle physics, and radiation science. • Medical Physics : Radiation Therapy, Diagnostic Imaging, Nuclear Medicine. • Teaching and Academia : University Lecturer/Professor, High School Teacher, Educational Outreach and Public Engagement.
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University. Minimum GPA of 3.2 for students from outside Lebanese University. *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☐ Electronics ☒ Physics
Coordinator of Master Program	Pr. Adnan NAJA *Contact information:* UL Email address: anaja@ul.edu.lb Alternative email: adnan_naja81@yahoo.fr Phone number: +961- 70 – 550 338

Research Master - M2
Physics of the Radiation-Matter Interaction
2024-2025

	Course			
	Code	**Title**	**Credits**	**Hours**
Semester 3	PIRM 500	Numerical and computational methods for scientific calculations	4	28
	PIRM 501	Fundamentals of radiation-matter interaction	4	28
	PIRM 502	Quantum Electrodynamics	4	28
	PIRM 503	Molecular Spectroscopy	4	28
	PIRM 504	Electronic and magnetic properties of materials	3	21
	PIRM 505	Nuclear physics with heavy ions	3	21
	PIRM 506	Plasma Physics	3	21
	PIRM 507	Measurement, instrumentation and computing tools	3	21
	RMSE 500	Research Methodology and Scientific English	2	24
	Total		**30**	**220**

	Course			
	Code	**Title**	**Credits**	**Hours**
Semestrer 4	PIRM 580	**Master Thesis**	30	
	Total		**30**	

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Master Program	FEME Field Electro-Mechanical Engineering
Master Type	☐ M1+ M2 Professional ☒ M2 Professional ☐ M2 Research
Teaching Language	☒ English ☐ French ☐ Mixed - English & French
Place of Teaching (Campus)	☒ Hadat ☐ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	The evolution of electro-mechanical engineering and the diversity of its technologies and the emergence of new related services create new jobs at the convergence of electronics, electrical, control, telecommunications, computers, HVAC, PLUMBING, management and others. One of the main disadvantages of actual academic engineering curriculum in electromechanical is its mismatch with the Lebanese and arab markets needs concerning the graduate skills. Firms are pushed to form new graduate engineers to the field actual skills. The main purpose of this master is to form people ready and capable to work in all types of field building and industrial electromechanical engineering projects. Courses: AUTOCAD FOR CIVIL, MECHANICAL AND ELECTRICAL, ELECTRONICS FOR ELECTROMECHANICAL, HVAC SYSTEMS, PLUMBING RENEWABLE ENERGY, BMS: BUILDING MANAGEMENT SYSTEMS & SMART HOUSES, PLC AND SCADA , NI CONTROL SYSTEMS + LABVIEW, BUILDING ELECTRIFICATION +MV/LV SWITCHGEARS, MACHINES: MOTORS, GENERATORS AND CONTROL , CONTRACT ADMINISTRATION, PROJECT PLANNING DELAY ANALYSIS AND MONITORING + PRIMAVERA
OUTCOMES	The Master2 Field Electro-Mechanical Engineering FEME, forms during one year engineering specialists in mechanical and electrical aspects. This master wants to form mainly senior engineers or executive managers of field studies in building and industrial electro-mechanical projects. So it is imperative that we must insist on all practical electro-mechanical aspects as well as the management and contractual aspects.
Fields of Work	The graduate with this degree should be able to work in studies as well as on site and should be aware of building and industrial electromechanical disciplines and management issues.
Admission Requirements	*GPA:* Minimum GPA of 54/100 for students from Lebanese University Minimum GPA of 3.0 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☒ Electronics ☐ Physics ☒ ELECTRICAL OR MECHANICAL ENGINEERING
Coordinator of Master Program	Pr. Yasser MOHANNA *Contact information:* UL Email address: yamoha@ul.edu.lb Phone number (*optional*): +961- (0)3 - 769556

Professional Master - M2
Field Electro Mechanical Engineering
2024-2025

Levelling

FEME 512 Renewable energy: solar cells, wind,.. (24 H)

FEME 515 NI control systems, Labview (24 H)

FEME 519 Project planning delay analysis and monitoring, Primavera (24 H)

FEME 503 Image processing and pattern recognition (24 H)

	Course				
	Code	**Title**	**Credits**	**TS**	**Hours**
Semester 3	FEME 510	HVAC systems	3		24
	FEME 511	Plumbing: fire fighting, waste, water and sewages treatment, pumping	3		24
	FEME 500	Management & Human Resources	2		24
	FEME 513	BMS: building management systems & smart houses	3		24
	FEME 514	PLC and SCADA: programmable logic controller and buses	3		24
	FEME 501	AUTOCAD for civil, mechanical and electrical	3		24
	FEME 516	Building electrification, MV/LV switchgears	3		24
	FEME 517	Machines: motors, generators and control	3		24
	FEME 518	Contract administration	3		24
	FEME 502	Electronics for Electromechanical	3		24
	ENGL 591	Scientific English & Communication skills	1	20	20
	Total		**30**		**260**

FEME 570 Tutorials + Seminars (60 H)

	Course				
	Code	**Title**	**Credits**		**Hours**
Semester 4	FEME 580	**Master Thesis**	30		
	Total		**30**		

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	Advanced electronic and Smart Systems
Master Type	☐ M1+ M2 Professional ☒ M2 Professional ☐ M2 Research
Teaching Language	☐ English ☐ French ☒ Mixed - English & French
Place of Teaching (Campus)	☐ Hadat ☒ Fanar ☐ Tripoli ☐ Nabatieh
About the Program	This proposed Master's degree program will be **interdisciplinary**, covering a range of topics including the **automation of complex systems** (such as **robotics** or **industrial processes**), **advanced software engineering** for electronics and **intelligent systems**, and **advanced electronics** focusing on integrated circuit design, electronic component reliability, and thermal management of electronic systems. This **fusion of electronics and IT** presents a valuable opportunity for companies aiming to lead the way in innovation and **professional development** within the **global marketplace**.
Program Learning Outcomes	▪ **Enable students to enhance their proficiency** by focusing on specialized fields such as robotics, connected embedded systems, and integrated circuit design, while also fostering a comprehensive understanding essential for effective project management. ▪ **Promote research and innovation** by inspiring students' curiosity and creativity through engaging them in pioneering research projects, conducted in collaboration with industry and research labs. ▪ **Facilitate interdisciplinary collaboration** by promoting dialogue among diverse fields like electronics, computer science, mechanics, and related disciplines. This approach aims to tackle the intricate challenges of contemporary engineering and cultivate a comprehensive problem-solving perspective. • **Equip students for diverse career paths** by delivering a versatile and adaptable education that prepares them for a multitude of opportunities in industries, research, product development, and beyond.
Fields of Work	Electronics and robotics engineer, Intelligent systems and integrated circuits designer, Project manager for technological innovation, Advanced technology consultant, PhD.
Admission Requirements	*GPA:* Minimum GPA of 60/100 for students from Lebanese University Minimum GPA of 75/100 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☒ Computer Science ☒ Electronics ☐ Physics ☐ Please add other accepted majors if applicable : ☒ electrical engineering
Coordinator of Master Program	Dr. Aline MSAED *Contact information:* UL Email address: aline.msaed@ul.edu.lb Alternative email: alinemsaed83@yahoo.com Phone number (*optional*): +961- 71 - 235591

Professional Master - M2
Advanced Electronic and Smart Systems
2024-2025

Semester 3	Course						
	Code	**Title**	**Credits**	**C**	**TS**	**LS**	**Hours**
	EASI 500	Integrated circuit design	2	7		13	20
	EASI 501	Analog integrated circuit	2	7		13	20
	EASI 502	Reliability of electronic components and systems	2	7	13		20
	EASI 503	Thermal management of electronic components	2	7		13	20
	EASI 504	Embedded systems	3	14		10	24
	EASI 505	Artificial intelligence	3	14		10	24
	EASI 506	Fundamentals of software development for electronics	2	7		13	20
	EASI 507	Advanced software engineering and electronics	2	7		13	20
	EASI 508	Sensor network and internet of things	2	7		13	20
	EASI 509	Control and modeling of robot systems	4	14	10	10	34
	EASI 510	Marketing and project management	2	7		17	24
	EASI XXX	Optional	3	14		10	24
	ENGL 591	Scientific English & Communication skills	1			20	20
	Total		**30**	**112**	**23**	**155**	**290**

EASI 511	Electronic components and essential tools	optionne	obligatory course for Informatics students
EASI 512	Python language	optionne	obligatory course for Electronics students

Semester 4	Course						
	Code	**Title**	**Credits**	**C**	**TS**	**LS**	**Hours**
	EASI 580	**Master Thesis**	30				
	Total		**30**				

LEBANESE UNIVERSITY
FACULTY OF SCIENCES
DEAN OFFICE

Master Programs

Please do not exceed one page for all the information

Master Program	PHYSIQUE ENERGETIQUE
Master Type	☐ M1+ M2 Professional ☒ M2 Professional ☐ M2 Research
Teaching Language	☐ English ☒ French ☐ Mixed - English & French
Place of Teaching (Campus)	☐ Hadat ☐ Fanar ☒ Tripoli ☐ Nabatieh
About the Program	**Préparation des étudiants aux métiers dans ce thématique, en développant des compétences scientifiques disciplinaires aussi bien que méthodologiques dans les domaines de l'énergétique et de l'environnement.**
Program Learning Outcomes	Compétences théoriques, numériques et professionnelles permettant à l'étudiant de se construire une vision critique et de concevoir des solutions vis-à-vis des problèmes concernant la consommation et l'économie de l'énergie, les énergies de substitution, l'impact sur l'environnement, la pollution et le traitement des déchets.
Fields of Work	1-Chargé de mission et /ou responsable de projet aux niveaux conception, réalisation et développement industriels dans nombreux secteurs d'activité : énergie (production, transformation, utilisation), génie thermique et frigorifique, climatisation, traitement des effluents et des déchets, dépollution, nouvelles énergies, etc... 2-Création d'entreprises de conseil, d'études et de services techniques et commerciaux dans les secteurs d'activités précités.
Admission Requirements	*GPA:* Minimum GPA of 55/100 for students from Lebanese University Minimum GPA of 3.2 for students from outside Lebanese University *Major:* ☐ Chemistry ☐ Biochemistry ☐ Animal Biology ☐ Plant Biology ☐ Math ☐ Computer Science ☐ Electronics ☒ Physics ☒ Civil and Mechanical Engineering
Coordinator of Master Program	Dr. Hamed EL KHATIB *Contact information:* UL Email address: Alternative email: h_elkhaib68@yahoo.com Phone number (***optional***): +961- 70 - 109522

Master Professionnel - M2
Physique Energétique
2024-2025

	Cours					
	Code	**Titre**	**Crédits**	**C**	**TD**	**Nb. d'heures**
Semestre 3	PNRJ 501	Normes et Gestion de Qualité	2	9	9	18
	PNRJ 502	Energie Solaire Thermique	4	16	16	32
	PNRJ 503	Energie Solaire Photovoltaïque	4	16	16	32
	PNRJ 504	Energies Eolienne et Marémotrice	4	16	16	32
	PNRJ 505	Economie de l'Energie et Cogénération	4	16	16	32
	PNRJ 506	Valorisation Energétique et Traitement des Déchets	3	12	12	24
	PNRJ 507	Environnement, Pollution et Recyclage	2	9	9	18
	PNRJ 508	Economie des Entreprises et Gestion de Projets	3	12	12	24
	PNRJ 520	Métrologie et Analyse des Données	3	12	12	24
	ENGL 591	Anglais Scientifique & Technique de Communication	1		20	20
	Total		**30**	**118**	**138**	**256**

	Cours					
	Code	**Titre**	**Crédits**	**C**	**TD**	**Nb d'heures**
Semestre 4	PNRJ 580	**Mémoire**	30			
	Total		**30**			