Ministry of Education
Federal University of Latin American Integration
Dean's Office for Undergraduate Studies

CURRICULUM - ENGINEERING PHYSICS

UNILA
Universidade Federal
da Integração
Latino-Americana

COURSE COMPONENT	PREREQUISITE (P) / COREQUISITE (C)	CREDITS	CREDIT HOURS				
			THEORETICAL	PRACTICE	MANDATORY INTERNSHIP	COMMUNITY OUTREACH	TOTAL
SEMESTER 1							
FUNDAMENTALS OF LATIN AMERICA I	(p) None	4	60	0	0	0	60
BASIC ADDITIONAL PORTUGUESE/SPANISH	(p) None	6	90	0	0	0	90
INTRODUCTION TO ENGINEERING PHYSICS	(p) None	2	30	0	0	0	30
ANALYTICAL GEOMETRY AND LINEAR ALGEBRA	(p) None	4	60	0	0	0	60
CALCULUS I	(p) None	6	90	0	0	0	90
GENERAL PHYSICS I	(p) None	4	60	0	0	0	60
LABORATORY OF GENERAL PHYSICS I	(c) General Physics I	2	0	30	0	0	30
TOTAL NUMBERS IN THE SEMESTER		**28**	**390**	**30**	**0**	**0**	**420**
SEMESTER 2							
FUNDAMENTALS OF LATIN AMERICA II	(p) None	4	60	0	0	0	60
INTRODUCTION TO SCIENTIFIC THINKING	(p) None	4	60	0	0	0	60
INTERMEDIATE ADDITIONAL PORTUGUESE/SPANISH I	(p) Basic Additional Portuguese/Spanish	6	90	0	0	0	90
ENTREPRENEURSHIP	(p) None	2	30	0	0	0	30
CALCULUS II	(p) Calculus I	6	90	0	0	0	90
GENERAL PHYSICS II	(p) General Physics I; (p) Calculus I	4	60	0	0	0	60
LABORATORY OF GENERAL PHYSICS II	(c) General Physics II	2	0	30	0	0	30
TOTAL NUMBERS IN THE SEMESTER		**28**	**390**	**30**	**0**	**0**	**420**
SEMESTER 3							
FUNDAMENTALS OF LATIN AMERICA III	(p) Fundamentals of Latin America I and II	2	30	0	0	0	30
ETHICS AND SCIENCE	(p) None	4	60	0	0	0	60
PROBABILITY AND STATISTICS	(p) Calculus I	4	60	0	0	0	60
CALCULUS III	(p) Calculus II; (p) Analytical Geometry and Linear Algebra	6	90	0	0	0	90
GENERAL PHYSICS III	(p) General Physics II; (p) Calculus II	4	60	0	0	0	60
LABORATORY OF GENERAL PHYSICS III	(c) General Physics III	2	0	30	0	0	30
GENERAL CHEMISTRY	(p) None	4	60	0	0	0	60
EXPERIMENTAL GENERAL CHEMISTRY	(c) General Chemistry	2	0	30	0	0	30
TOTAL NUMBERS IN THE SEMESTER		**28**	**360**	**60**	**0**	**0**	**420**
SEMESTER 4							
COMPUTER PROGRAMMING	(p) None	4	15	45	0	0	60
NUMERICAL CALCULUS	(p) Calculus III	4	30	30	0	0	60
GENERAL PHYSICS IV	(p) General Physics III	4	60	0	0	0	60
LABORATORY OF GENERAL PHYSICS IV	(c) General Physics IV	2	0	30	0	0	30

Course	Prerequisites						
TECHNICAL DRAWING	(p) None	4	0	60	0	0	60
SCIENCE OF THE ENVIRONMENT	(p) General Chemistry	2	30	0	0	0	30
CLASSICAL MECHANICS I	(p) General Physics II; (p) Calculus II	4	60	0	0	0	60
MATHEMATICAL PHYSICS I	(p) Calculus III	4	60	0	0	0	60
TOTAL NUMBERS IN THE SEMESTER		**28**	**255**	**165**	**0**	**0**	**420**
SEMESTER 5							
FUNDAMENTALS OF THERMODYNAMICS	(p) General Physics II	4	60	0	0	0	60
NUMERICAL AND COMPUTATIONAL METHODS IN ENGINEERING PHYSICS I	(p) Computer Programming; (p) Numerical Calculus	4	30	30	0	0	60
ELECTRICAL CIRCUITS	(p) General Physics III	4	60	0	0	0	60
MODERN PHYSICS	(p) General Physics IV; (p) Classical Mechanics I; (p) Mathematical Physics I	4	60	0	0	0	60
LABORATORY OF MODERN PHYSICS	(c) Modern Physics	2	0	30	0	0	30
ELECTROMAGNETISM	(p) General Physics III; (p) Mathematical Physics I	6	90	0	0	0	90
FLUID MECHANICS	(p) General Physics II; (p) Calculus II	4	60	0	0	0	60
TOTAL NUMBERS IN THE SEMESTER		**28**	**360**	**60**	**0**	**0**	**420**
SEMESTER 6							
APPLIED ELECTRONICS	(p) Electrical Circuits	4	30	30	0	0	60
TRANSPORT PHENOMENA	(p) Fundamentals of Thermodynamics	4	60	0	0	0	60
CONTROL SYSTEMS	(p) Electrical Circuits	4	45	15	0	0	60
ELECTROCHEMICAL ENGINEERING	(p) General Chemistry; (p) Experimental General Chemistry	4	30	30	0	0	60
QUANTUM MECHANICS I	(p) Modern Physics; (p) Mathematical Physics I	6	90	0	0	0	90
SOLID STATE I	(p) Modern Physics; (p) Fundamentals of Thermodynamics	4	60	0	0	0	60
ELECTIVE CHART 1	See Chart I	2	30	0	0	0	30
TOTAL NUMBERS IN THE SEMESTER		**28**	**345**	**75**	**0**	**0**	**420**
SEMESTER 7							
DIGITAL LOGIC	(p) Electrical Circuits	4	30	30	0	0	60
POWER ELECTRONICS	(p) Applied Electronics	4	30	30	0	0	60
TECHNICAL MECHANICS AND RESISTANCE OF MATERIALS	(p) General Physics I; (p) Calculus II	4	60	0	0	0	60
PROJECT DEVELOPMENT	(p) Control Systems	4	60	0	0	0	60
STATISTICAL PHYSICS	p) Fundamentals of Thermodynamics; (p) Moderen Physics	4	60	0	0	0	60
DIGITAL SIGNAL PROCESSING	(p) Applied Electronics	4	30	30	0	0	60
ELECTIVE CHART 2	See Chart II	4	60	0	0	0	60
TOTAL NUMBERS IN THE SEMESTER		**28**	**330**	**90**	**0**	**0**	**420**
SEMESTER 8							
ADVANCED INSTRUMENTATION TECHNIQUES	(p) Applied Electronics; (p) Control Systems;	6	30	60	0	0	90
MANUFACTURING PROCESSES	(p) Project Development	4	30	30	0	0	60
MICROINTERNSHIP I	(p) Project Development	2	0	30	0	0	30
ELECTIVE CHART 3	See Chart III	4	60	0	0	0	60
ELECTIVE CHART 4	See Chart IV	8	120	0	0	0	120
ELECTIVE CHART 5	See Chart V	4	60	0	0	0	60
TOTAL NUMBERS IN THE SEMESTER		**28**	**300**	**120**	**0**	**0**	**420**
SEMESTER 9							
INTERNSHIP IN ENGINEERING PHYSICS	(p) Microinternship I	16	0	0	240	**0**	240
TOTAL NUMBERS IN THE SEMESTER		**16**	**0**	**0**	**240**	**0**	**240**
SEMESTER 10							

FINAL PAPER	(p) Internship in Engineering Physics	8	120	0	**0**	**0**	120
ELECTIVE ANY CHART	See Corresponding Chart	8	120	0	0	**0**	120
TOTAL NUMBERS IN THE SEMESTER		**16**	**240**	**0**	**0**	**0**	**240**
COMPLEMENTARY ACADEMIC ACTIVITIES							
COMPLEMENTARY ACADEMIC ACTIVITIES		**4**	**-**	**-**	**-**	**-**	**60**
COMMUNITY OUTREACH ACTIVITIES							
COMMUNITY OUTREACH ACTIVITIES		**29**	**-**	**-**	**-**	**-**	**435**
TOTAL NUMBER OF ELECTIVES							
TOTAL NUMBER OF ELECTIVES		30	-	-	-	-	450

TOTAL CREDIT HOURS OF THE COURSE		**MINIMUM CLOCK HOURS REQUIRED BY MEC**		
4335		**3600**		
TOTAL HOURS - MANDATORY INTERNSHIP	**240**			
TOTAL HOURS – COMPLEMENTARY ACADEMIC ACTIVITIES	**60**			
TOTAL HOURS - INTERNSHIP + COMPLEMENTARY ACADEMIC ACTIVITIES	**300**	**MAXIMUM CLOCK HOURS ALLOWED BY MEC**		**867**
TOTAL HOURS OF COMMUNITY OUTREACH INCLUDED IN THE CURRICULUM	**435**	**MINIMUM CLOCK HOURS REQUIRED BY MEC**		**434**

DISCIPLINES OFFERED BY THE COURSE – CHART 1	**PREREQUISITE (P) / COREQUISITE (C)**	**CREDITS**	**CREDIT HOURS (CLASS HOURS)**				
			THEORETICAL	**PRACTICE**	**MANDATORY INTERNSHIP**	**COMMUNITY OUTREACH**	**TOTAL**
ENGINEERING ADMINISTRATION	(p) None	2	30	0	0	0	30
PRODUCT ENGINEERING	(p) None	2	30	0	0	0	30
ACCOUNTING AND FINANCES	(p) None	2	30	0	0	0	30
INDUSTRIAL STATISTICS AND QUALITY CONTROL	(p) Probability and Statistics	4	60	0	0	0	60
ENGINEERING ECONOMICS	(p) Numerical Calculus; (p) Probability and Statistics	4	60	0	0	0	60
SAFETY ENGINEERING	(p) None	2	30	0	0	0	30
INDUSTRIAL ORGANIZATION	(p) None	2	30	0	0	0	30
INDUSTRIAL ECONOMICS	(p) None	4	60	0	0	0	60

DISCIPLINES OFFERED BY OTHER COURSES – CHART 1	**PREREQUISITE (P) / COREQUISITE (C)**	**CREDITS**	**CREDIT HOURS (CLASS HOURS)**				
			THEORETICAL	**PRACTICE**	**MANDATORY INTERNSHIP**	**COMMUNITY OUTREACH**	**TOTAL**
LIBRAS	(p) None	4	60	0	0	0	60

DISCIPLINES OFFERED BY THE COURSE – CHART 2	**PREREQUISITE (P) / COREQUISITE (C)**	**CREDITS**	**CREDIT HOURS (CLASS HOURS)**				
			THEORETICAL	**PRACTICE**	**MANDATORY INTERNSHIP**	**COMMUNITY OUTREACH**	**TOTAL**
COMPUTERIZED INSTRUMENTATION DESIGN I	(p) Technical Drawing	4	60	0	0	0	60
NUMERICAL AND COMPUTATIONAL METHODS IN ENGINEERING PHYSICS II	(p) Numerical and Computational Methods in Engineering Physics I	4	30	30	0	0	60
INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS	(p) Calculus III	4	60	0	0	0	60
COMPLEX VARIABLES	(p) Calculus III	4	60	0	0	0	60
PHYSICAL CHEMISTRY	(p) General Chemistry	4	60	0	0	0	6
ANALYTICAL CHEMISTRY	(p) General Chemistry	2	30	0	0	0	30
EXPERIMENTAL ANALYTICAL CHEMISTRY	(p) General Chemistry; (p) Experimental General Chemistry; (c) Analytical Chemistry	2	0	30	0	0	30

DISCIPLINES OFFERED BY THE COURSE – CHART 3	**PREREQUISITE (P) / COREQUISITE (C)**	**CREDITS**	**CREDIT HOURS (CLASS HOURS)**				
			THEORETICAL	**PRACTICE**	**MANDATORY INTERNSHIP**	**COMMUNITY OUTREACH**	**TOTAL**
MATHEMATICAL PHYSICS II	(p) Introduction to Partial Differential Equations; (p) Mathematical Physics I	4	60	0	0	0	60
QUANTUM MECHANICS II	(p) Quantum Mechanics I	4	60	0	0	0	60

DISCIPLINES OFFERED BY THE COURSE	PREREQUISITE (P) / COREQUISITE (C)	CREDITS	THEORETICAL	PRACTICE	MANDATORY INTERNSHIP	COMMUNITY OUTREACH	TOTAL
CLASSICAL MECHANICS II	(p) Classical Mechanics I	4	60	0	0	0	60
SOLID STATE II	(p) Solid State I	4	60	0	0	0	60
ADDITIONAL TOPICS ON ELECTRICAL CIRCUITS	(p) Electrical Circuits	4	30	30	0	0	60
PHASE DIAGRAM	(p) Fundamentals of Thermodynamics	4	45	15	0	0	60
MAGNETIC MATERIAL TECHNOLOGY AND APPLICATIONS	(p) Solid State I	4	30	30	0	0	60
FERROELECTRIC MATERIAL TECHNOLOGY AND APPLICATIONS	(p) Solid State I	4	30	30	0	0	60
SEMICONDUCTING MATERIAL TECHNOLOGY AND APPLICATIONS	(p) Solid State I	4	30	30	0	0	60
SUPERCONDUCTING MATERIAL TECHNOLOGY AND APPLICATIONS	(p) Solid State I	4	30	30	0	0	60
MODERN OPTICS	(p) Modern Physics	4	60	0	0	0	60

| DISCIPLINES OFFERED BY THE COURSE – CHART 4 | PREREQUISITE (P) / COREQUISITE (C) | CREDITS | CREDIT HOURS (CLASS HOURS) | | | | |
			THEORETICAL	PRACTICE	MANDATORY INTERNSHIP	COMMUNITY OUTREACH	TOTAL
CHARACTERIZATION METHODS I	(p) Applied Electronics	4	30	30	0	0	60
CHARACTERIZATION METHODS II	(p) Characterization Methods I	4	30	30	0	0	60
COMPUTERIZED INSTRUMENTATION DESIGN II	(p) Computerized Instrumentation Design I	4	30	30	0	0	60
OPTOELECTRONICS	(p) Applied Electronics	4	30	30	0	0	60
EXPERIMENTS IN ENGINEERING PHYSICS	(p) Solid State I	2	0	30	0	0	30
ELECTRICAL MACHINES	(p) Electrical Circuits	4	60	0	0	0	60
EXPERIMENT AUTOMATION AND CONTROL	(p) Control Systems	4	30	30	0	0	60
LASER AND APPLICATIONS	(p) Modern Optics	4	60	0	0	0	60
SENSORS AND TRANSCONDUCTORS	(p) Applied Electronics	4	45	15	0	0	60
MICROINTERNSHIP II	(p) Microinternship I	2	0	30	0	0	30

| DISCIPLINES OFFERED BY THE COURSE – CHART 5 | PREREQUISITE (P) / COREQUISITE (C) | CREDITS | CREDIT HOURS (CLASS HOURS) | | | | |
			THEORETICAL	PRACTICE	MANDATORY INTERNSHIP	COMMUNITY OUTREACH	TOTAL
QUANTUM INFORMATION TECHNOLOGY AND APPLICATIONS	(p) Quantum Mechanics I	4	60	0	0	0	60
PROBLEM BASED LEARNING (PBL) SCIENCE AND ENGINEERING	(p) Project Development	4	30	30	0	0	60
TOPICS ON OPTIMIZATION	(p) Numerical Calculus	4	60	0	0	0	60
PROCESSES AND CHARACTERIZATION OF MICRO AND NANO ELECTRONIC DEVICES	(p) Electric Circuits; (c) Applied Electronics	2	30	0	0	0	30
MATERIALS SCIENCE	(p) General Physics I; (p) General Chemistry	4	60	0	0	0	60