Ingénieur ENSEEIHT Electronique et Génie Electrique (Apprentis)

Ingénieur ENSEEIHT Electronique et Génie Electrique

ECTS
180 credits

Duration
3 ans

Teaching organization
Formation en alternance, Formation initiale

Program

Ingénieur ENSEEIHT par l'Apprentissage Electronique et Génie Electrique (En-Ge) 1ère année

Semestre 5-1A En-Ge FISA

	Nature	CM	TD	TP	Crédits
MATHEMATICS AND COMPUTER SCIENCE FOR ENGINEER	UE				4 credits
Math Review	UE				
Computer Science for Engineers	UE				
MATHEMATICS AND SCIENTIFIC COMPUTING	UE				4 credits
Real and Complex Analysis	UE				
Matlab-Simulink	UE				
APPLIED ELECTRICITY	UE				4 credits
Circuit basics	UE				
Single-phase systems	UE				
Single-phase transformer	UE				
ELECTRONIC COMPONENTS AND CIRCUITS	UE				4 credits
Electronic Components	UE				
Circuit theory	UE				
Basic Electronic Function Project	UE				
Analog circuits	UE				
SCIENCES HUMAINES SOCIALES ET JURIDIQUES-S5-FISA	UE				4 credits
Careers and Management 1	Matière				
Careers and Management 2	Matière				
Anglais Professionnel-S5-App	Matière				
COMPANY SEMESTER 5	UE				10 credits

Semestre 6-1A En-Ge FISA

	Nature	CM	TD	TP	Crédits
MATHEMATICS AND COMPUTER SCIENCE FOR ENGINEERS	UE				4 credits
Real analysis	UE				
Probabilities and Statistics	UE				
Calculator Structure	UE				
ANALOG ELECTRONICS	UE				4 credits
Analog Electronics Project	UE				
Electronic Functions	UE				
Analog circuits	UE				

LINEAR CIRCUITS AND SYSTEMS	UE	4 credits
Combinatorial and sequential logic	UE	
Filtering	UE	
Continuous Linear Systems	UE	
ELECTRICAL NETWORKS AND ENERGY CONVERSION	UE	4 credits
Introduction to Static Conversion	UE	
Switching power supply - Non-isolated structures	UE	
Introduction to Electromechanical Conversion	UE	
Three-phase networks	UE	
SCIENCES HUMAINES SOCIALES ET JURIDIQUES-S6-FISA	UE	4 credits
Anglais Professionnel-S6-FISA	Matière	
Careers and Management 1	Matière	
Careers and Management 2	Matière	
COMPANY SEMESTER 6	UE	10 credits

Ingénieur ENSEEIHT Electronique et GE 2ème année (Apprentis)

Semestre 7-2A-En-Ge FISA

	Nature	CM	TD	TP	Crédits
MATHEMATICS AND COMPUTER SYSTEMS	UE				4 credits
Partial Differential Equation	UE				
Modeling and Development of Industrial Systems: Programmed Logic	UE				
Modeling and Development of Industrial Systems—Object-Oriented Modeling and Development	UE				
DIGITAL SYSTEMS AND DIGITAL SIGNAL PROCESSING	UE				4 credits
Microprocessors	UE				
Digital Signal Processing	UE				
STATIC CONVERSION AND THEIR CONTROL	UE				4 credits
Design and implementation of Static Converters	UE				
Closed-loop control of continuous linear systems	UE				
SCIENCES HUMAINES SOCIALES ET JURIDIQUES-S7-FISA	UE				4 credits
Anglais Professionnel-S7-App	Matière				
Careers and Management 1- App Sem7	Matière				
Careers and Management 2- APP Sem7	Matière				
ELECTIVE TEACHING UNIT	UE				4 credits
OPTION EN: MATERIAL DESCRIPTION LANGUAGES and TR	UE				4 credits
Digital design in VHDL	UE				
VHDL Project	UE				
DSP, Digital Filtering	Élément constitutif				
OPTION ENERGY: ELECTROMECANIC CONVERSION	Matière				4 credits

Machine Modeling	UE				
Principles and structures of electrical machines	LV2 facultative				
COMPANY SEMESTER 7	UE				10 credits

Semestre 8-2A-En-Ge FISA

	Nature	CM	TD	TP	Crédits
ELECTIVE OPTIONS	UE				16 credits
ENERGY OPTION	UE				16 credits
ELECTRIC SYSTEM	Choix				4 credits
Machine/converter association and their control	UE				
Analysis and modeling of a vehicle through reverse engineering	Stage				
AUTOMATIC AND TR	UE				4 credits
Space State	UE				
sampled linear systems	UE				
Real Time Informatics	UE				
Non Linear Systems	UE				
ECO-ENERGY	UE				4 credits
FACTS Introduction	UE				
Renewable Energies	UE				
POWER ELECTRONICS	UE				4 credits
Inverter	UE				
Switching Mechanisms	UE				
Thermics	UE				
ELECTRONIC OPTION	UE				16 credits
ANALOG CIRCUIT DESIGN	Choix				4 credits
Linear Circuits	UE				
Non Linear Circuits	UE				
Analog Electronics Project	UE				
PROPAGATION AND RADIATION	LV2 facultative				4 credits
Transmission Lines	UE				
Electromagnetism and guided propagation	UE				
Radiation and Antennas	UE				
OPTOELECTRONICS AND RADIOFREQUENCIES	UE				4 credits
Optoelectronics	UE				
RF Circuit	UE				
MMIC	UE				
RF-Digital Project	UE				
INTEGRATION	UE				4 credits
MOS	UE				
Front-End instrumentation	UE				
Design and FPGA	UE				
SCIENCES HUMAINES SOCIALES ET JURIDIQUES-S8-FISA	UE				4 credits

Anglais Professionnel-S8-App	Matière				
Careers and Management 1	Matière				
Careers and Management 2	Matière				
COMPANY SEMESTER 8	UE				10 credits

Ingénieur ENSEEIHT Electronique et GE 3ème année (Apprentis)

	Nature	CM	TD	TP	Crédits

Semestre 9 FISA (manuel)

	Nature	CM	TD	TP	Crédits
Semestre 9 - Systems Integration (INSYS)	Choix				30 credits
ANALOG ELECTRONIC SYSTEMS IN RADIOFREQUENCIES	UE				5 credits
Optoelectronic Components and Circuits	Matière				
Filter Synthesis	Matière				
Integrated photonics	Matière				
Internet of Things	Matière				
DIGITAL SYSTEMS	UE				5 credits
Synthesis strategy	Matière				
EMC for integrated circuits	Matière				
System on Chip	Matière				
ANALOG AND DIGITAL SYSTEMS	UE				5 credits
ADC and DAC	Matière				
Space Embedded Systems Conferences	Matière				
Integration of instrumentation chains	Matière				
Reliability of embedded systems	Matière				
1st ELECTIVE TEACHING UNIT	UE				5 credits
ADVANCED DIGITAL ELECTRONICS	UE				5 credits
FPGA system design for signal processing	Matière				
Circuit testing and fault simulation	Matière				
ADVANCED ANALOG ELECTRONICS	UE				5 credits
Integration of instrumentation chains	Matière				
Analog ASIC project	Matière				
2nd ELECTIVE TEACHING UNIT	UE				5 credits
POWER MANAGEMENT	UE				5 credits
Microprocessor Power Supply	Matière				
MOSFET Driver Circuits	Matière				
EMC for SMPS	Matière				
FEM Modeling of Integrated passive filters	Matière				
ADVANCED RADIOFREQUENCY ELECTRONICS	UE				5 credits
RF equipment	Matière				
MMIC	Matière				
MEMS	Matière				
SOFT AND HUMAN SKILLS 3EA S9	UE				5 credits
Professional English-LV1-Semestre 9	Bloc				

Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	
CV Entretiens(3EA)	Matière	
Recherche doc.(3EA)	Matière	
CHOIX Careers and Management 3EA S9	Choix	
Entrepreneurship Project	Matière	
Corporate Project and Social Responsability	Matière	
Semestre 9 - Communication Systems (SYSCOM)	**Choix**	**30 credits**
APPLIED PHYSICS AND NUMERICAL METHODS	UE	5 credits
Electromagnetism and multiscale devices	Matière	
Multiphysics Models	Matière	
Electromagnetism and nanoelectronics	Matière	
Synthesis of High Frequency Equivalent Electrical Circuits	Matière	
HIGH FREQUENCY EMBEDDED SYSTEMS	UE	5 credits
Microwave and Optical Sensors	Matière	
HF optoelectronic components and circuits	Matière	
Internet of Things	Matière	
Passive high frequency devices in waveguide technology	Matière	
MICROWAVE CIRCUITS AND ELECTROMAGNETIC COMPATIBILITY	UE	5 credits
Antenna networks	Matière	
Space antennas	Matière	
Aeronautical EMC 1	Matière	
Space Embedded Systems Conferences	Matière	
Microwave power amplifiers	Matière	
Aeronautical EMC 2	Matière	
PROPAGATION PHENOMENA AND RADAR	UE	5 credits
Actual propagation of electromagnetic waves	Matière	
Electromagnetic diffraction analysis / Radar equipment	Matière	
Radar project	Matière	
ELECTIVE TEACHING UNIT	Choix	5 credits
ADVANCED RADIOFREQUENCY ELECTRONICS	UE	5 credits
RF equipment	Matière	
MMIC	Matière	
MEMS	Matière	
MODELING	UE	5 credits
Variational methods for solving partial differential equations of physics	Matière	
Integral methods	Matière	
Plasma physics and applications	Matière	
SOFT AND HUMAN SKILLS 3EA S9	UE	5 credits
Professional English-LV1-Semestre 9	Bloc	
Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	

CV Entretiens(3EA)	Matière	
Recherche doc.(3EA)	Matière	
CHOIX Careers and Management 3EA S9	Choix	
Entrepreneurship Project	Matière	
Corporate Project and Social Responsability	Matière	
Semestre 9 - Control Architecture Computer Science and Embedded Systems (ACISE)	**Choix**	**30 credits**
SYSTEMS CONTROL, FILTERING AND DIAGNOSTIC	UE	5 credits
Filtering estimation	Matière	
System Monitoring and Diagnostics	Matière	
Multidimensional Systems	Matière	
OPTIMISATION DES SYSTEMES ET LEUR COMMANDE	UE	5 credits
Robust control	Matière	
Optimal Control	Matière	
Combinatorial optimization	Matière	
Opti TER	Matière	
Linear programming and unimodularity	Matière	
Continuous optimization	Matière	
MODELING, ANALYSIS, SIMULATION OF DISCRETE SYSTEMS	UE	5 credits
Modeling and analysis of discrete systems	Matière	
Simulation of discrete event systems	Matière	
Planning and Scheduling	Matière	
Hybrid Dynamic Systems	Matière	
Flexible Workshop TER	Matière	
ADVANCED CONTROLLED SYSTEMS	UE	5 credits
Adaptive and predictive controls	Matière	
Aeronautical systems	Matière	
Robotics: Modeling and Control	Matière	
Advanced Control TER	Matière	
Electrical Systems Control	Matière	
ADVANCED CRITICAL COMPUTING SYSTEMS	UE	5 credits
IT Security	Matière	
IT operational security	Matière	
Safety Testing and Evaluation	Matière	
Development of critical computer systems	Module	
SOFT AND HUMAN SKILLS 3EA S9	UE	5 credits
Professional English-LV1-Semestre 9	Bloc	
Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	
CV Entretiens(3EA)	Matière	
Recherche doc.(3EA)	Matière	
CHOIX Careers and Management 3EA S9	Choix	
Entrepreneurship Project	Matière	
Corporate Project and Social Responsability	Matière	

Semestre 9 - Advanced Electromechanics (EMA)	**Choix**	**30 credits**
PHYSICS FOR MECHATRONICS	UE	5 credits
Advanced phenomena in electromechanical conversion	Matière	
Introduction to Magnetohydrodynamics	Matière	
Modeling of coupled phenomena	Matière	
NUMERICAL METHODS AND OPTIMISATION	UE	5 credits
Finite element numerical modelling	Matière	
Optimal control	Matière	
Optimised sizing of electrical machines	Matière	
Numerical modelling of machines	Matière	
DESIGN OF ELECTROMECHANICAL SYSTEMS	UE	5 credits
Design elements of static converters	Matière	
Mechanical design of actuators and generators	Matière	
Introduction to CAD	Matière	
Electric Generators	Matière	
ARCHITECTURES OF MECHATRONIC SYSTEMS	UE	5 credits
Multidimensional Systems	Matière	
Electric actuator control strategy	Matière	
TER Electric Actuator Control	Matière	
Electromagnetic compatibility	Matière	
Filtering estimation	Matière	
APPLIED MECHATRONICS	UE	5 credits
TER Advanced Control (EMA)	Matière	
Elastic metamaterials and actuators for space (Universeh)	Matière	
Winding techniques for electrical machines	Matière	
System Monitoring and Diagnostics	Matière	
SOFT AND HUMAN SKILLS 3EA S9	UE	5 credits
Professional English-LV1-Semestre 9	Bloc	
Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	
CV Entretiens(3EA)	Matière	
Recherche doc.(3EA)	Matière	
CHOIX Careers and Management 3EA S9	Choix	
Entrepreneurship Project	Matière	
Corporate Project and Social Responsability	Matière	
Semestre 9 - Energy conversion and electrical networks (CERE)	**Choix**	**30 credits**
POWER SYSTEMS AND NETWORKS	UE	5 credits
System design	Matière	
Static Converters for power network conditioning	Matière	
Static Converters HVDC Networks	Matière	
CVS DESIGN	UE	5 credits
CVS Design	Matière	
CVS control	Matière	

Architecture and Control TER	Matière	
Power Electronic Technology	Matière	
STATIC CONVERTER AND ADVANCED SYSTEMS	UE	5 credits
CVS reliability	Matière	
EMC	Matière	
X. Levels	Matière	
Switching and functional integration	Matière	
ACTUATORS AND GENERATORS	UE	5 credits
Actuator control	Matière	
Actuator Control TER	Matière	
Multidimensional Systems	Matière	
Conception avancée des actionneurs et générateurs	UE	
SMARTGRIDS AND MICROGRIDS	UE	5 credits
Autonomous networks	Matière	
Sources, reversibility, storage	Matière	
Smart grids	Matière	
1/2 Themed days	Matière	
SOFT AND HUMAN SKILLS 3EA S9	UE	5 credits
Professional English-LV1-Semestre 9	Bloc	
Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	
CV Entretiens(3EA)	Matière	
Recherche doc.(3EA)	Matière	
CHOIX Careers and Management 3EA S9	Choix	
Entrepreneurship Project	Matière	
Corporate Project and Social Responsability	Matière	
Semestre 9 - EcoEnergy (EE)	**Choix**	**30 credits**
SYSTEMIC DESIGN	UE	5 credits
System modeling in Bond Graph	Matière	
Eco-design and LCA	Matière	
Hydrogen supply chain	Matière	
Optimization of energy processes and systems	Matière	
SMART-GRIDS	UE	5 credits
Decentralized, embedded electrical networks	Matière	
Energy Hybridization of Systems	Matière	
Smart grids	Matière	
HYDROGEN VECTOR	UE	5 credits
Hydrogen production	Matière	
Hydrogen storage	Matière	
Fuel cells and hydrogen applications	Matière	
Electrochemistry	Matière	
RENEWABLE ENERGIES	UE	5 credits
Wind Power Systems	Matière	
Photovoltaic APP	Matière	

Low-Power Hydroelectric Installations	Matière	
NON ELECTRIC RENEWABLE ENERGIES	Élément constitutif	5 credits
Biofuel systems	Matière	
Valorisation Biomasse Haute Température	Matière	
Renewable heat	Matière	
GENERAL TRAINING	UE	5 credits
Professional English-LV1-Semestre 9	Bloc	
Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	
Themed Day: Energy and Sustainable Development	Matière	
METHODES NUMERIQUES ET OPTIMISATION-2	**UE**	**5 credits**
Optimal control	Matière	
High Performance Computing	Matière	
Similation Numérique en optique	UE	
Topological Optimisation	Matière	
Finished volumes	Matière	
METHODES NUMERIQUES POUR LES PROBLEMES DE DIFFRACTION	**UE**	**5 credits**
Integral methods	Matière	
Electromagnetic diffraction analysis / Radar equipment	Matière	
Integral methods	Matière	
CEM ET MATHEMATIQUES APPLIQUEES	**UE**	**5 credits**
Multiphysics Models	Matière	
Variational methods for solving partial differential equations of physics	Matière	
Aeronautical EMC 1	Matière	
Electromagnetic compatibility	Matière	
High Performance Computing	Matière	
PHYSIQUE POUR LA MECATRONIQUE - PN	**UE**	**5 credits**
Plasma physics and applications	Matière	
Advanced phenomena in electromechanical conversion	Matière	
Modeling of coupled phenomena	Matière	
Introduction to Magnetohydrodynamics	Matière	
SOFT AND HUMAN SKILLS 3EA S9	**UE**	**5 credits**
Professional English-LV1-Semestre 9	Bloc	
Anglais Scientifique	Matière	
Choix 2 Anglais Professionnel - 3A	Choix	
Anglais Clinique	Matière	
Anglais de Cambridge ou Projet	Matière	
CV Entretiens(3EA)	Matière	
Recherche doc.(3EA)	Matière	
CHOIX Careers and Management 3EA S9	Choix	

Entrepreneurship Project	Matière	
Corporate Project and Social Responsability	Matière	
HIGH PERFORMANCE COMPUTING	UE	5 credits
Advanced Languages for programming	Matière	
Advanced Techniques for Scientific computing	Matière	
Meshing, Pre and Post Processing	Matière	

Semestre 9 Parcours Physique Numérique-3A-3EA

	Nature	CM	TD	TP	Crédits
OUTILS NUMERIQUES POUR LA PROPAGATION	UE				5 credits
PHYSIQUE ET OPTIMISATION	UE				5 credits
Physique et modélisation	Matière				
METHODES NUMERIQUES	UE				5 credits
Projet Méthode numérique et calcul haute performance	Matière				
HIGH PERFORMANCE COMPUTING	UE				5 credits
Advanced Languages for programming	Matière				
Advanced Techniques for Scientific computing	Matière				
Meshing, Pre and Post Processing	Matière				

Semestre 10 3EA à N7

	Nature	CM	TD	TP	Crédits
Projet Fin d'Etude 3EA sans Projet Long	UE				30 credits
Stage 2A 3EA	Matière				6 credits
PFE 3EA sans PL	Stage				24 credits
PFE 3EA avec Projet Long	UE				30 credits
Stage 2A 3EA	Matière				6 credits
Projet Long 3EA	UE				8 credits
Projet de Fin d'Etudes 3EA	UE				22 credits