

Électronique

Semester 8 -

MODULE	UV	TITLE	PARTICIPANTS	ECTS	
	E8-J	Heterogeneous digital electronic systems <i>Option pour E8-D</i>		9.00	
EN210		Advanced micro informatics	J. CRENNE (resp)	2.00	page 0
EN211		Machine to machine	Y. BORNAT (resp)	0.50	page 0
EN212		Systems on programmable chips	Y. BORNAT (resp)	1.00	page 0
EX200		Personalized module (1)	P. LANUSSE (resp)	1.00	page 0
		<i>CE200 Management system</i>	J. MARGUERAT (resp)		page 0
		<i>CE203 Economic intelligence</i>	C. DELESSE (resp)		page 0
		<i>CE210 Software law</i>	S. CANEVET F. PELLEGRINI (resp)		page 0
		<i>CE215 Introduction to financial markets</i>	É. ASTIEN (resp)		page 0
		<i>CE219 management of innovative projects</i>	B. BERDEU (resp)		page 0
		<i>CE235 Sciences techniques et sociétés</i>	N. BONNETON		page 0
		<i>EA214 Power electronics 2</i>	S. AZZOPARDI (resp)		page 0
		<i>EN216 Conception d'un processeur avec jeu d'instructions élémentaires</i>	D. DALLET (resp)		page 0
		<i>EX213 Module libre extérieur</i>	P. LANUSSE (resp)		page 0
		<i>IT221 Introductory course on programming with real-time Labview</i>	V. COUDRE (resp)		page 0
		<i>LC206 TOEIC Re-sit S8</i>	K. BEIRNE J. FAUCHER P. FLOQUET (resp) S. MÉDINA		page 0
		<i>ME200 Nanoelectronics</i>	S. RENAUD (resp)		page 0
		<i>ME201 Microsystems</i>	C. DEJOURS (resp) V. RAIMBAULT		page 0
EX201		Personalized module (2)	P. LANUSSE (resp)	1.00	page 0
		<i>CE200 Management system</i>	J. MARGUERAT (resp)		page 0
		<i>CE203 Economic intelligence</i>	C. DELESSE (resp)		page 0
		<i>CE210 Software law</i>	S. CANEVET F. PELLEGRINI (resp)		page 0
		<i>CE215 Introduction to financial markets</i>	É. ASTIEN (resp)		page 0
		<i>CE219 management of innovative projects</i>	B. BERDEU (resp)		page 0
		<i>CE235 Sciences techniques et sociétés</i>	N. BONNETON		page 0
		<i>EA214 Power electronics 2</i>	S. AZZOPARDI (resp)		page 0
		<i>EX213 Module libre extérieur</i>	P. LANUSSE (resp)		page 0
		<i>IT221 Introductory course on programming with real-time Labview</i>	V. COUDRE (resp)		page 0
		<i>LC206 TOEIC Re-sit S8</i>	K. BEIRNE J. FAUCHER P. FLOQUET (resp) S. MÉDINA		page 0
		<i>ME200 Nanoelectronics</i>	S. RENAUD (resp)		page 0
		<i>ME201 Microsystems</i>	C. DEJOURS (resp) V. RAIMBAULT		page 0
PR214		Thematic project	S. AZZOPARDI Y. BERTHOUMIEU Y. BORNAT P. DONDON M. DONIAS P. LANUSSE V. LEBRET P. MELCHIOR G. MORIZET F. RODES (resp) P. VALLET J. VINASSA	3.50	page 0

CE200 : Management system

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
EX201	Personalized module (2)	page 0
EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX206	Module list (engineer culture)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
EX216	Optional units O82 (if B2 validated, 3 units CExxx)	page 0

ECTS credits :

1.00

Evaluation :

S1: ET x1

Number of hours :

Lecture : 12.00

Teacher(s) :

MARGUERAT Jean-Michel

Title :

Management system

Abstract :

Formation access to the current requirements of companies in terms of quality, safety and environment.

Plan :

CE203 : Economic intelligence

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
EX201	Personalized module (2)	page 0
EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX206	Module list (engineer culture)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
EX216	Optional units O82 (if B2 validated, 3 units CExxx)	page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1

Number of hours :

Lecture : 12.00

Teacher(s) :

DELESSE Claude

Title :

Economic intelligence

Abstract :

Plan :

CE210 : Software law

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
EX201	Personalized module (2)	page 0
EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX206	Module list (engineer culture)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
EX216	Optional units O82 (if B2 validated, 3 units CExxx)	page 0

ECTS credits :

1.00

Evaluation :

S1: Proj(Rap) x1

Number of hours :

Lecture :	12.00
Individual work :	8.00

Teacher(s) :

CANEVET Sébastien
PELLEGRINI Francois

Title :

Software law

Abstract :

The aim of this class is to familiarize students with the main legal notions used in the computer programming sector, the relevant laws, and their impact on the technical side, in order for them to be able to integrate these aspects in their engineering practice.

Plan :

- Author's right and copyright
- The adaptation of author's right to software
- Licenses and contracts
- Main types of licenses
- Interoperability
- Contracts for software development
- Incongruity of software patents

Prerequisite :

Basic notions in computer programming, software development and operating systems: source code vs. object code, compilation vs. interpretation, main features of an operating system, operations of Internet.

Document(s) :

Numerous reference resources available on the Internet: laws, licenses, etc.

Keyword(s) :

law, copyright, software, license, trade mark, data base, patent.

CE215 : Introduction to financial markets

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
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EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX206	Module list (engineer culture)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
EX216	Optional units O82 (if B2 validated, 3 units CExxx)	page 0

ECTS credits :

1.00

Evaluation :

S1: ET(1h,E,sd,sc) x1 + ET x1

Number of hours :

Lecture : 12.00

Teacher(s) :

ASTIEN Éric

Title :

Introduction to financial markets

Abstract :

Introduction to financial engineering. The module has a history of market finance and develops the concepts of bonds, shares and risk management. Prerequisites for integrating 3rd year option IRE

Plan :

- * Partie 1 : le marché monétaire
- * Partie 2 : Le marché obligataire
- * Partie 3 : la bourse des valeurs mobilières
- * Partie 4 : la couverture des risques

CE219 : management of innovative projects

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
EX201	Personalized module (2)	page 0
EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX206	Module list (engineer culture)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
EX216	Optional units O82 (if B2 validated, 3 units CExxx)	page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1

Number of hours :

Lecture : 12.00

Teacher(s) :

BERDEU Bernard

Title :

management of innovative projects

Abstract :

Products complexity shortened time-to market delivery, search for resources optimization are reasons why organizations increasingly resort to management by project. The course introduces the notion of project, the management tools and techniques used to master it, and the human and social dimensions inherent to any project.

Plan :

Document(s) :

Keyword(s) :

CE235 : Sciences techniques et sociétés

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
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EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX206	Module list (engineer culture)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
EX216	Optional units O82 (if B2 validated, 3 units CExxx)	page 0

ECTS credits :

1.00

Evaluation :

S1: ET(1h30,E,sd,sc) x1 + ET x1

Number of hours :

Lecture :	12.00
Individual work :	15.00

Teacher(s) :

BONNETON Natalie

Title :

Sciences techniques et sociétés

Abstract :

This teaching module aims to:

- Define the concept of technical system
- Restore the concept of artificial intelligence
- Revisiting the concept of progress and its social and cultural impact

Plan :

1. Technique : contrôle et délinquance
2. Notion de système technique
3. Enjeux culturels de l'intelligence artificielle
4. La notion de progrès

EA214 : Power electronics 2

Shared by choice module(s) :

EX200 Personalized module (1)
EX201 Personalized module (2)

page 0
page 0

ECTS credits :

1.00

Evaluation :

S1: ET(2h,E) x1

Number of hours :

Lecture : 12.00

Teacher(s) :

AZZOPARDI Stéphane

Title :

Power electronics 2

Abstract :

Provide to the audience the basic requirement to design a power system

A overview of the transformer modelling and his application to a pulse transmission circuit allows to understand the approach of the energy isolated conversion. The main isolated DC-DC converters are studied. Some power semiconductors are analysed as well as their control and protection circuits. A short description of the basic Switching Mode Power Supplies is proposed. Finally the basics of the dynamics modelling of DC-DC converters are detailed.

Plan :

- * Ch. 1 : Transformers (basics, simple model, design, pulse transmission)
- * Ch. 2 : Isolated DC-DC converters (flyback, forward, push-pull..)
- * Ch. 3 : Power semiconductors (internal structure, characteristics : Thyristors, IGBT)
- * Ch. 4 : Control circuit and protection of power semiconductors (snubbers, soft-switching)
- * Ch. 5 : Switching Mode Power Supplies examples
- * Ch. 6 : An introduction to the dynamics modelling of DC-DC converters

Prerequisite :

Power Electronics 1

Document(s) :

Lecture material/ Power Electronics, Mohan, Undeland, Robbins / Alimentations à découpage (2ème édition), Michel Girard, Hugues Angelis, Magali Girard, DUNOD, 2003, ISBN 2-1000-6940-3/ Techniques de l'Ingenieur

Keyword(s) :

Isolated DC-DC converters, transformers, control circuits, protection circuits, dynamics modelling

Online course :

www.enseirb.fr/~azzopard

EN210 : Advanced micro informatics

Shared by UV(s) :

E8-J Heterogeneous digital electronic systems

page 0

ECTS credits :

2.00

Evaluation :

S1: ET(1h,E,sd,sc) x1

Number of hours :

Practical work :

21.00

Teacher(s) :

CRENNE Jérémie

Title :

Advanced micro informatics

EN211 : Machine to machine

Shared by UV(s) :

E8-J Heterogeneous digital electronic systems

page 0

ECTS credits :

0.50

Evaluation :

S1: ET(1h20,E) x1

Number of hours :

Lecture : 4.00

Teacher(s) :

BORNAT Yannick

Title :

Machine to machine

EN212 : Systems on programmable chips

Shared by UV(s) :

E8-J Heterogeneous digital electronic systems

page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1

Number of hours :

Lecture : 4.00

Practical work : 9.00

Teacher(s) :

BORNAT Yannick

Title :

Systems on programmable chips

Abstract :

This module is an introduction to system design on FPGAs. The students are faced to the different issues that occur when mixing hardware and software modules in a single design.

Prerequisite :

VHDL

Document(s) :

VHDL and processor descriptions, software suite for software assembly

EN216 : Conception d'un processeur avec jeu d'instructions élémentaires

Shared by choice module(s) :

EX200 Personalized module (1)

page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1

Number of hours :

Lecture : 12.00

Teacher(s) :

DALLET Dominique

Title :

Conception d'un processeur avec jeu d'instructions élémentaires

Abstract :

L'objectif de ce module est d'assembler des fonctions élémentaires (combinatoires et séquentielles) pour réaliser un processeur programmable avec un jeu d'instructions élémentaires. L'architecture conçue sera intégrée sur une carte de prototypage FPGA.

Le processeur à concevoir est un processeur 8-bits à usage universel. Il est capable d'exécuter 4 types d'instructions. Ce processeur est basé sur un registre accumulateur appelé ACCU de taille 8 bits. Chaque instruction est codée sur 8 bits. Deux bits pour coder le type de l'opération (code.op) et 6 bits pour coder l'opérande ou l'adresse de l'opérande dans la mémoire selon le type de l'instruction.

Plan :

Le module se décompose en 6 séances de 2 heures.

Durant les deux premières séances, l'architecture typique simplifiée des processeurs à usage universel est détaillée. Puis un travail sur table aboutira à la définition d'un schéma bloc hiérarchique du processeur.

Les autres séances sont consacrées à la conception du processeur à l'aide du langage VHDL dans l'environnement ISE de Xilinx.

Document(s) :

1 support de cours et 1 support de bureau d'étude.

EX200 : Personalized module (1)

Shared by UV(s) :

E8-G	Mixed Electronics and HF circuits	page 0
E8-H	Automatic Control	page 0
E8-I	Signal and image processing	page 0
E8-J	Heterogeneous digital electronic systems	page 0

To choose from :

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CE203	Economic intelligence	page 0
CE210	Software law	page 0
CE215	Introduction to financial markets	page 0
CE219	management of innovative projects	page 0
CE235	Sciences techniques et sociétés	page 0
EA214	Power electronics 2	page 0
EN216	Conception d'un processeur avec jeu d'instructions élémentaires	page 0
EX213	Module libre extérieur	page 0
IT221	Introductory course on programming with real-time Labview	page 0
LC206	TOEIC Re-sit S8	page 0
ME200	Nanoelectronics	page 0
ME201	Microsystems	page 0

ECTS credits :

1.00

Number of hours :

Lecture : 12.00

Teacher(s) :

LANUSSE Patrick patrick.lanusse@enseirb.fr 05 4000 2417
<http://www.enseirb.fr/~lanusse>

Title :

Personalized module (1)

EX201 : Personalized module (2)

Shared by UV(s) :

E8-G	Mixed Electronics and HF circuits	page 0
E8-H	Automatic Control	page 0
E8-I	Signal and image processing	page 0
E8-J	Heterogeneous digital electronic systems	page 0

To choose from :

CE200	Management system	page 0
CE203	Economic intelligence	page 0
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EX213	Module libre extérieur	page 0
IT221	Introductory course on programming with real-time Labview	page 0
LC206	TOEIC Re-sit S8	page 0
ME200	Nanoelectronics	page 0
ME201	Microsystems	page 0

ECTS credits :

1.00

Evaluation :

No description

Number of hours :

Lecture : 12.00

Teacher(s) :

LANUSSE Patrick patrick.lanusse@enseirb.fr 05 4000 2417
<http://www.enseirb.fr/~lanusse>

Title :

Personalized module (2)

EX213 : Module libre extérieur

Shared by choice module(s) :

EX200 Personalized module (1)
EX201 Personalized module (2)

page 0
page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1

Teacher(s) :

LANUSSE Patrick

patrick.lanusse@enseirb.fr

05 4000 2417

<http://www.enseirb.fr/~lanusse>

Title :

Module libre extérieur

Abstract :

Ce module peut concerner des activités d'encadrement, de pratique sportive ou culturelle de bon niveau ou de formation, non déjà prises en compte dans le processus d'évaluation propre à l'Ecole. Son choix est conditionner à un accord du responsable pédagogique de 2ème année. Ce module est évalué à travers un rapport décrivant l'activité concernée ainsi que ses connections avec la future fonction d'ingénieur.

IT221 : Introductory course on programming with real-time Labview

Shared by choice module(s) :

EX200 Personalized module (1)
EX201 Personalized module (2)

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page 0

ECTS credits :

1.00

Evaluation :

S1: ET(2h,E) x1

Number of hours :

Tutorial classes : 18.00

Teacher(s) :

COUDRE Vincent

Title :

Introductory course on programming with real-time Labview

Abstract :

L'objectif du cours est l'initiation à la programmation Labview (National Instrument) permettant la gestion interactive d'applications automatisées. Une attention plus particulière sera portée sur les applications nécessitant ayant des contraintes de temps-réel comme celles implémentant des boucles de commande.

Prerequisite :

Aucun pré-requis

LC206 : TOEIC Re-sit S8

Shared by UV(s) :

I8-G UE-B: case 3 : 1module EX214+ 2 modules EX220 + LC206 (TOEIC recovery) page 0

Shared by choice module(s) :

EX200	Personalized module (1)	page 0
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EX202	Modules "Cultures de l'ingénieur" (choisir 1 module exactement)	page 0
EX215	Optional units O82 (if B2 not validated, LC206+1 unit CExxx)	page 0
LC207	Required course for students not having obtained the B2 level in English (785 TOEIC, 5.5 IELTS) Prepares students to resit the TOEIC.	page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1; S2: CC x1

Number of hours :

Tutorial classes :	22.00
Individual work :	15.00

Teacher(s) :

BEIRNE Kenneth
FAUCHER Jill
FLOQUET Pierre
MÉDINA Susan

Title :

TOEIC Re-sit S8

Abstract :

- Continuing work on the TOEIC
- Compulsory for students who have not yet obtained the required score (785 points TOEIC or 5.5 IELTS)

Plan :

- Listening skills
- Grammatical accuracy
- Reading skills
- International business context

Document(s) :

Language learning software: TOEIC Simulator, Voicebook.

Keyword(s) :

B2 level on the Common European Framework (CEF) <http://culture2.coe.int/portfolio>

Online course :

See the Language Resource Centre web site : <https://sites.google.com/site/guidecrel/>

ME200 : Nanoelectronics

Shared by choice module(s) :

EX200 Personalized module (1)
EX201 Personalized module (2)

page 0
page 0

ECTS credits :

1.00

Evaluation :

S1: ET(1h,E) x1

Number of hours :

Tutorial classes : 18.00

Teacher(s) :

RENAUD Sylvie

Title :

Nanoelectronics

Abstract :

This course includes 6 practical labs. All are conducted in a microelectronics research unit. During each lab, the students participate in the design, or characterization of nano-components: VLSI, MEMs, organic components, power devices.

ME201 : Microsystems

Shared by choice module(s) :

EX200 Personalized module (1)
 EX201 Personalized module (2)

page 0
 page 0

ECTS credits :

1.00

Evaluation :

S1: CC x1

Number of hours :

Combined lecture and tutorial classes : 12.00
 Individual work : 12.00

Teacher(s) :

DEJOURS Corinne corinne.dejous@ims-bordeaux.fr
 RAIMBAULT Vincent

Title :

Microsystems

Abstract :

This class presents a general description of microsystems, a presentation of the technologies implemented and a projection towards nano-sciences and nano-technologies (4*2h).
 An individual presentation front of the group (in teams of two) allows everyone to investigate a topic and results in evaluation (2*2h).

Plan :

MICROSYSTEMS_____

Contents

THE WORLD OF MICROSYSTEMS-Introduction (definition, historic, examples, the market)-Towards miniaturization (examples, why, the concept)-Microsystem and microtechnologies-The dimensions-A self contained component-Microsystems and interdisciplinarity-Microsystem structure-Some important milestones-Examples : Accelerometers, Adaptative optics, Ink jet printers, Insulin dispensers, lab on chip, DNA biochip-The market-Economic data-Distribution-Car industry-Medical-Evolution-Industrial activity-Bibliography.

MICROSYSTEM TECHNOLOGIES-Manufacturing sequence-Specificities-Lithography-Double side alignments-Etching-Bulk micro machining-Surface micro machining-Bonding-Active materials-Examples-PolyMUMPS technology-Electrostatic micro engine-SUMMIT V technology-Micro engines-Micro gears-Mechanical transmissions-Hinges-Mobile micro mirrors.

NANO SCIENCES AND NANO TECHNOLOGIES Introduction

Prerequisite :

Bases on integrated circuit-Electricity, mechanics, optics, thermics (bachelor level)

Document(s) :

Books and Journals of the domain

Keyword(s) :

Microsystems Microtechnologies Nanosciences

Online course :

Some details available at <http://www.enseirb.fr/~pistre>

PR214 : Thematic project

Shared by UV(s) :

E8-G	Mixed Electronics and HF circuits	page 0
E8-H	Automatic Control	page 0
E8-I	Signal and image processing	page 0
E8-J	Heterogeneous digital electronic systems	page 0

ECTS credits :

3.50

Evaluation :

S1: Proj(Sout, 20 min) x1

Number of hours :

Practical work : 42.00

Teacher(s) :

AZZOPARDI Stéphane

BERTHOUMIEU Yannick

BORNAT Yannick

DONDON Philippe

DONIAS Marc

LANUSSE Patrick

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LEBRET Valery

MELCHIOR Pierre

MORIZET Guy

RODES Francis

VALLET Pascal

VINASSA Jean-Michel

Title :

Thematic project

Abstract :

A project subject in the field of Electrical Engineering design is proposed at the beginning of S8 at each couple of student. The students are managed by a teacher during weekly tutorial classes that span over a full semester.

The objective of the project proposed to the students is to design and realize in its definitive version: a module or a system that calls for a wide or a specific domain of Electrical Engineering.

The themes and the difficulty level of these design projects are aiming at reaching the following objectives:

- Training to the work of a R&D engineer that is facing issues in the field of electrical engineering design.
- An application as large as possible of the theoretical courses proposed at ENSEIRB MATMECA in the fields of: mixed electronic, automatic control, power electronic, RF design, signal and image processing.
- An initiation to project management
- A development of initiatives and the senses of responsibilities
- The acquisition of aptitudes in communication and team work
- The quest for efficiency and pragmatism
- A sensitization to the capabilities and limitations of the tools currently used by an engineer: Scientific and technical documentation, mathematics, simulation tools, test and measurements.
- A consciousness of the differences that exist between reality and the results given by: a mathematical analysis, a computer simulation or a measurement.

In order to reach these objectives, the students can rely on tools and equipments similar to those encountered in the industry:

- A specific laboratory where each couple of students disposes of a work bench that is equipped with standard test and measurement instrumentation, a work station or a Personal Computer. Furthermore, each work station or Personal Computer allows an access to the internet and offers a complete set of CAE / CAD software tools.
- A laboratory dedicated to DC and Low Frequency test and measurement
- A laboratory dedicated to High Frequency test and measurement
- A laboratory dedicated to Automatic Control
- A scientific library
- Two technical libraries
- A fabrication facility and a laboratory dedicated to the realization of Printed Circuit Boards and prototypes
- An electronic components stock and purchase centre managed by a technician affected to the electronic projects laboratories.

Plan :

1. Bibliographic research
2. Theoretical design of the electronic circuits
3. Prototypes realization
4. Test and measurements
5. Report writing

Prerequisite :

General Electronic. (S1 & S2): Analog Electronic UVE3B (S3) : Analog Circuits & systems, Digital design.

Document(s) :

Project subject, manufacturer's data books, scientific and technical books, printed courses, internet access. Sample of project's titles proposed: Circuit for extracting the maximum power from a solar cell, composite amplifier, cardio-frequency-meter, storm detector, battery charger and light control using a bicycle alternator and a high efficiency converter, 27MHz/ 5W class C transmitter for FSK modulation, transceiver 120MHz AM 1W, wireless infrared audio transmission, coded infrared remote control, car accelerometer, digital thermometer …

Keyword(s) :

Analog electronic, digital electronic, mixed circuits, feed back control, power electronic, RF circuits