UNIVERSITY POLITEHNICA OF BUCHAREST

COURSE CATALOGUE

List of study programmes in foreign languages

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DOMAIN: ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

Bachelor programs

Technologies and Telecommunications Systems (TST)

FACULTY: Electronics, Telecommunications and Information Technology

DESCRIPTION AND MAIN OBJECTIVES

In the context of the current technological progress of telecommunication area, the fields of activity are practically unlimited: fixed and mobile communications, wireless networks, hardware, software and various related services, Internet of Things, audio engineering and more.
The Technologies and Telecommunication Systems study program provides the graduates with adequate skills needed for current jobs. The modern scientific and technical training, highly qualitative and competitive, offers the graduates many hiring opportunities, and international openness.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Mathematical Analysis 1	3	1				4
1	1	Algebra and Geometry	3	1				5
1	1	Physics 1	3	1	1			5
1	1	Computers Programming	2		2			4
1	1	Fundamentals of Electrical Engineering 1	3	2				5
1	1	Chemistry	2		1			3
1	1	Foreign Language 1		2				2
1	1	Physical Education and Sport 1		2				2
1	2	Mathematical Analysis 2	3	2				5
1	2	Physics 2	3		1			4
1	2	Algorithms and Data Structures	2		1			4
1	2	Fundamentals of Electrical Engineering 2	3	1				5
1	2	Measurements in Electronics and Telecommunications	2		1.5			4

1	2	Special Mathematics	3	1				4
Optional Subject O1								
1	2	Office Software	1		1			2
1	2	Engineering Graphics and Technical Drawing	1		1			2
1	2	3D Models and Design	1		1			2
1	2	Practical Implementation of Electronic Schemes - Getting Started	1		1			2
Optional Subject O2								
1	2	Philosophy	2					2
1	2	Sociology	2					2
1	2	Psychology	2					2
1	2	Communication	2					2
1	2	European Culture and Civilization	2					2
1	2	European Political and Administrative Institutions	2					2
1	2	European Integration	2					2
Facultative subjects								
1	2	Internet Services	1		1			2
1	2	Foreign Language 2		2				2
1	2	Physical Education and Sport 2		2				2
1	1	Educational Psychology	2	2				5
1	2	Pedagogy 1	2	2				5
Second Year Compulsory subjects								
2	1	Signals and Systems	3	2	1			6
2	1	Electronic Materials	3		1.5			5
2	1	Electronic Devices	3	2	1			6
2	1	Passive Components and Circuits	2		1.5			4
2	1	Object Oriented Programming	2		1			3
2	1	Project - Signals and programming				1		1
2	2	Basic Electronic Circuits	3	2				5
2	2	Digital Integrated Circuits	3	1	1			4
2	2	Microprocessor Architecture	3		1			5
2	2	Circuits Analysis and Synthesis	3	2	2			6

2	2	Electronic Circuits - Laboratory			1.5			2
2	2	Physical Education and Sport 4		2				2
Optional Subject O1								
2	1	Macroeconomics	2					2
2	1	Microeconomics	2					2
2	1	Elements of Law and Business Legislation	2					2
Optional Subject O2								
2	1	Numerical Methods	1		1			3
2	1	A.I. Systems Engineering	1		1			3
2	1	CAD Techniques for Electronic Modules Design	1		1			3
Optional Subject O3								
2	2	Electronic Components Models for SPICE	1		1			3
2	2	Electronic Interconnections Technologies	1		1			3
2	2	Programming for Android	1		1			3
Optional Subject O4								
2	2	Management	2		1			3
2	2	Marketing	2		1			3
Facultative subjects								
2	1	Foreign Language 3		2				2
2	1	Physical Education and Sport 3		2				2
2	2	Foreign Language 4		2				2
2	1	Pedagogy II	2	2				5
2	2	Didactics of the specialization	2	2				5
Third Year Compulsory subjects								
3	1	Information Transmission Theory	3	1	1			5
3	1	Microwaves	3	1	1			5
3	1	Analogic Integrated Circuits	3	1	1			5
3	1	Electronic Measuring Instruments	3		1.5			4
3	1	Microcontrollers	2		1			3
3	1	Programming competences - Certifying Exam	1					2
3	1	Project 1 - Electronic Devices and Circuits				1		2

3	1	Training activity – Project 2				0.5		1
3	2	Decision and expectation in Information Processing	3	1	1			5
3	2	Practical Activity (3rd year)					30	6
3	2	Digital Signal Processing	3	1	1	1		5
3	2	Analog and Digital Communications	3	1				3
3	2	Network Architectures and Internet	2		1			3
3	2	Microwave Circuits	2	1	1			3
Optional Subjects O1								
3	1	Automatic Control in Electronics and Telecommunications	2		1			3
3	1	Electromagnetic Compatibility	2		1			3
3	1	Audio Engineering	2		1			3
3	1	Fundamentals of Information Science	2		1			3
3	1	Applied Programming of Interfaces	2			1		3
Optional Subjects O2								
3	2	Project 2				1		2
Optional Subjects O3								
3	2	Television	2		1			3
3	2	Networks and Services Security	2		1			3
3	2	Basics of Operating Systems and Virtualization	2		1			3
3	2	Fundamentals of Cryptology	2		1			3
Facultative subjects								
3	1	Development of Innovative Android Applications	1		1	1		3
3	1	Physical Education and Sport 5		2				2
3	2	Physical Education and Sport 6		2				2
3	1	Computer-assisted instruction	1	1				2
3	1	Pedagogical practice in pre-university education (1)					3	3
3	2	Classroom management	1	1				3
3	2	Pedagogical practice in pre-university education (2)					3	2
3	2	Graduation exam: level 1 – Didactical Portfolio						5
Fourth Year Compulsory subjects								

4	1	Data Communications	3	1				5
4	1	Communications Networks	2		1.5			4
4	1	Signal Processors for Communications	2		1.5			4
4	1	Radio Communications Systems and Equipment	2		1.5			4
4	1	Antennas and Propagation	2		1			3
4	1	Databases	2		1			3
4	1	Analog and Digital Communications - Laboratory			2			2
4	2	Mobile Communications	2	0.5	1.5			6
4	2	Multimedia Coding - Techniques and Applications	2		1.5			4
4	2	Multiplex Transmission Techniques and Systems	2		1.5			4
Optional Subjects O1								
4	1	Radar	2		1			3
4	1	Transmission Media	2		1			3
4	1	Fundamentals of Cryptology 2	2		1			3
Optional Subjects O2								
4	1	Project 3				1		2
Optional Subjects O3								
4	2	Multiple Access Techniques	2		1			3
4	2	Optical Communications	2		1			3
4	2	Traffic Engineering	2		1			3
4	2	Neural Networks and Fuzzy Systems	2		1			3
Optional Subjects O4								
4	2	Quality and Reliability	1		1			3
4	2	Management and Legislation in Telecom and Electronics	1		1			3
Diploma Project								
4	2	Practical Activity for Diploma Project					4	5
4	2	Diploma Project Preparation Activities					30	5
Facultative subjects								
4	1	Automotive electronics	2		1			3
4	1	Practical Activity S7					30	2
4	1	Introduction to Astronomy	1		1			2

OTHER INFORMATION

All subjects of the program are available for Erasmus incoming students. This study program is EUR-ACE certified since 2017.

WEBSITE:	http://www.telecom.pub.ro/en/teaching/bachelor/tst/
CONTACT PERSON:	Mr. Octavian FRATU

Applied Electronics (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The program has run for 30 years and produced graduates now working in key positions in renowned companies. Some of them founded their own businesses, and some chose to dedicate their activity to research and academia. The program offers a balanced arrangement between general engineering training, specific training in the electronic engineering and information technologies fields, combined with efficient professional communication and management skills.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Calculus 1	3	2				5
1	1	Linear Algebra	2	2				4
1	1	Fundamentals of Electrical Engineering 1	2	1				3
1	1	Chemistry	2	1				3
1	1	Operating systems 1	2		2			4
1	1	Programming Languages	2		2			4
1	1	Computer aided Graphics	1		1			3
1	1	Professional communication 1		2				2
1	1	Physical Education 1			1			2
1	2	Calculus 2	3	2				5
1	2	Physics 1	2	1	1			4
1	2	Fundamentals of Electrical Engineering 2	2	2				5
1	2	Electronic Devices	2	1	1			4
1	2	Data Structures and Algorithms	2		2			4
1	2	Introduction to Web Programming	2		2			4

1	2	Professional communication 2		2				2
1	2	Physical Education 2			1			2
		Facultative subjects						
1	1	European Culture and Civilisation 1	1	1				2
1	1	Foreign language 1	1	1				2
1	1	English for Engineering Academic Study 1	1	1				2
1	1	Romanian Language for Foreign Students 1		2				2
1	2	European Culture and Civilisation 2	1	1				2
1	2	Foreign Language 2	1	1				2
1	2	English for Engineering Academic Study 2	1	1				2
1	2	Romanian Language for Foreign Students 2		2				2
		Second Year Compulsory subjects						
2	1	Special Mathematics 1	2	2				4
2	1	Probabilities & Statistics	2	1				3
2	1	Physics II	2		1			4
2	1	Fundamental Electronic Circuits	2		1			4
2	1	Digital integrated Circuits	2		2			4
2	1	Databases	2		1	1		5
2	1	Object Oriented Programming	2		2			4
2	1	Microeconomics	1	1				2
2	2	Microprocessor Architecture	2		2			4
2	2	Signals and Systems	2	1	1			5
2	2	Fundamentals of Electrical Engineering 3	2	1	1			4
2	2	Numerical Methods	2		2			5
2	2	Operating Systems 2	3	1	1			5
2	2	Electronic Measurements, Sensors and Transducers	3		2			5
2	2	Macroeconomics	1	1				2
		Facultative subjects						
2	1	Technical Writing 1		2				2
2	1	Romanian Language for Foreign Students 3		2				2
2	1	Foreign Language 3		2				2
2	1	Physical Education 3			2			2
2	2	Technical Writing 2		2				2
2	2	Romanian Language for Foreign Students 4		2				2
2	2	Foreign Language 4		2				2
2	2	Physical Education 4			2			2

		Third Year Compulsory subjects						
3	1	Data Transmissions	2		1			4
3	1	Project Digital Integrated Circuits				2		2
3	1	Computer Networks	3		2			4
3	1	Analog Integrated Circuits	2		1			3
3	1	Advanced Computer Graphics	1		2			3
3	1	Money and Banking	1	1				2
3	1	Computer Architecture	2		2			4
3	2	Digital Signal Processing	2		1	1		3
3	2	Neural Networks and Genetic Algorithms	2		2			3
3	2	Microwaves	2		1	1		3
3	2	Business Administration	1	1				2
3	2	Internet Programming Technologies	2		1			2
3	2	Microcontrollers	2		1	1		3
3	2	Domain Internship					30	4
3	2	Specialty Internship					30	4
		Optional Subjects						
3	1	Reliability and Quality Control	2		1			4
3	1	Application Development for Mobile Devices	2		1			4
3	1	Algorithm Design and Complexity	2		1			4
3	1	Internet of Things	2		1			4
3	2	Human-Computer Interaction	2		1			3
3	2	Micro-sensors Technology (MEMS)	2		1			3
3	2	Multiplexed Transmission Systems	2		1	1		3
3	2	Nanotechnology applications in electronics and telecommunications	2		1	1		3
		Facultative subjects						
3	2	Ethics and Academic Integrity	1					2
		Fourth Year Compulsory subjects						
4	1	Image Processing	2		1	1		5
4	1	Project Neural Networks and Genetic Algorithms				2		2
4	1	Television	2		2			4
4	1	Software Engineering	2		1	1		4
4	1	Fundamentals of Management	1	1				2
4	2	Optoelectronics	3		2			5
4	2	Security and Encryption	2		1	1		5
4	2	Electronic CAD	2		2			5

4	2	Industrial Management	1	1				2
4	2	Diploma Project				8		4
4	2	Diploma Project Practice					60	5
		Optional Subjects						
4	1	Microprocessor Systems	2		1	1		4
4	1	Mobile Systems and Programming for Wireless Networks	2		1	1		4
4	1	Analog & Digital Transmissions	2		1	1		5
4	1	Systems Engineering	2		1	1		5
4	1	Programmable Electronic Systems with FPGA	2		2			4
4	1	Bioinformatics	2		2			4
4	2	Architectures and Protocols for Integrated Net	2		2			4
4	2	Medical Electronics	2		2			4

OTHER INFORMATION

This program accepts incoming Erasmus students for one semester or an entire year.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mr. Bujor PAVALOIU

Applied Electronics (taught in English)

FACULTY: Electronics, Telecommunications and Information Technology

DESCRIPTION AND MAIN OBJECTIVES

In the context of the current technological progress of electronic devices, the emerging fields of activity are practically unlimited: industrial electronics, automation, medical electronics, artificial intelligence, information technologies, image processing, military, geology, security, robotics applications (human-machine interface systems) and many more.
This program offers graduates with adequate skills for the modern jobs. The Applied Electronics study program is perfectly framed in the policy of the current field, both in terms of content and structure, as well as in terms of international skills and openness offered to students.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		

First Year Compulsory subjects								
1	1	Mathematical Analysis 1	3	1				4
1	1	Algebra and Geometry	3	1				5
1	1	Physics 1	3	1	1			5
1	1	Computers Programming	2		2			4
1	1	Fundamentals of Electrical Engineering 1	3	2				5
1	1	Chemistry	2		1			3
1	1	Foreign Language 1		2				2
1	1	Physical Education and Sport 1		2				2
1	2	Mathematical Analysis 2	3	2				5
1	2	Physics 2	3		1			4
1	2	Algorithms and Data Structures	2		1			4
1	2	Fundamentals of Electrical Engineering 2	3	1				5
1	2	Measurements in Electronics and Telecommunications	2		1.5			4
1	2	Special Mathematics	3	1				4
Optional Subject O1								
1	2	Office Software	1		1			2
1	2	Engineering Graphics and Technical Drawing	1		1			2
1	2	3D Models and Design	1		1			2
1	2	Practical Implementation of Electronic Schemes - Getting Started	1		1			2
Optional Subject O2								
1	2	Philosophy	2					2
1	2	Sociology	2					2
1	2	Psychology	2					2
1	2	Communication	2					2
1	2	European Culture and Civilisation	2					2
1	2	European Political and Administrative Institutions	2					2
1	2	European Integration	2					2
Facultative subjects								
1	2	Internet Services	1		1			2

1	2	Foreign Language 2		2				2
1	2	Physical Education and Sport 2		2				2
1	1	Educational Psychology	2	2				5
1	2	Pedagogy 1	2	2				5
Second Year Compulsory subjects								
2	1	Signals and Systems	3	2	1			6
2	1	Electronic Materials	3		1.5			5
2	1	Electronic Devices	3	2	1			6
2	1	Passive Components and Circuits	2		1.5			4
2	1	Object Oriented Programming	2		1			3
2	1	Project - Signals and programming				1		1
2	2	Basic Electronic Circuits	3	2				5
2	2	Digital Integrated Circuits	3	1	1			4
2	2	Microprocessor Architecture	3		1			5
2	2	Circuits Analysis and Synthesis	3	2	2			6
2	2	Electronic Circuits - Laboratory			1.5			2
2	2	Physical Education and Sport 4		2				2
Optional Subject O1								
2	1	Macroeconomics	2					2
2	1	Microeconomics	2					2
2	1	Elements of Law and Business Legislation	2					2
Optional Subject O2								
2	1	Numerical Methods	1		1			3
2	1	A.I. Systems Engineering	1		1			3
2	1	CAD Techniques for Electronic Modules Design	1		1			3
Optional Subject O3								
2	2	Electronic Components Models for SPICE	1		1			3
2	2	Electronic Interconnections Technologies	1		1			3
2	2	Programming for Android	1		1			3
Optional Subject O4								
2	2	Management	2		1			3

2	2	Marketing	2		1			3
Facultative subjects								
2	1	Foreign Language 3		2				2
2	1	Physical Education and Sport 3		2				2
2	2	Foreign Language 4		2				2
2	1	Pedagogy II	2	2				5
2	2	Didactics of the specialization	2	2				5
Third Year Compulsory subjects								
3	1	Information Transmission Theory	3	1	1			5
3	1	Microwaves	3	1	1			5
3	1	Analogic Integrated Circuits	3	1	1			5
3	1	Electronic Measuring Instruments	3		1.5			4
3	1	Microcontrollers	2		1			3
3	1	Programming competences - Certifying Exam	1					2
3	1	Project 1 - Electronic Devices and Circuits				1		2
3	1	Training activity – Project 2				0.5		1
3	2	Decision and expectation in Information Processing	3	1	1			5
3	2	Practical Activity (3rd year)					30	6
3	2	Digital Signal Processing	3		1	1		4
3	2	Television	2		1			3
3	2	Sensors and Signal Conditioning Circuits	2		1			3
3	2	Communications Systems	2		1			2
3	2	Industrial Electronics and Informatics	2		1			2
3	2	Programming Technologies for Internet	2		1			3
Optional Subjects O1								
3	1	Automatic Control in Electronics and Telecommunications	2		1			3
3	1	Electromagnetic Compatibility	2		1			3
3	1	Audio Engineering	2		1			3
3	1	Fundamentals of Information Science	2		1			3
3	1	Applied Programming of Interfaces	2			1		3
Optional Subjects O2								

3	2	Project 2 – Programmable Electronics				1		2
Facultative subjects								
3	1	Development of Innovative Android Applications	1		1	1		3
3	1	Physical Education and Sport 5		2				2
3	2	Physical Education and Sport 6		2				2
3	1	Computer-assisted instruction	1	1				2
3	1	Pedagogical practice in pre-university education (1)					3	3
3	2	Classroom management	1	1				3
3	2	Pedagogical practice in pre-university education (2)					3	2
3	2	Graduation exam: level 1 – Didactical Portfolio						5
Fourth Year Compulsory subjects								
4	1	Computer Architectures	2		2			4
4	1	Programmable Electronic Systems	2		1			5
4	1	Medical imaging	2		2			4
4	1	Medical electronics and informatics	2		2			4
4	1	Power Electronic Processors	2		1			4
4	1	3D Graphics	2		1.5			4
4	1	Databases	2		1			3
4	2	Robotics	2		1			4
4	2	Automatic Testing of Equipment and Processes	2		1			3
4	2	Reconfigurable Computing Systems	2		1			3
4	2	Computer aided analysis of power electronic circuits	2		2			4
4	2	Neural Networks and Fuzzy Systems	2		1			3
Optional Subjects O1								
4	1	Project 3				1		2
Optional Subjects O2								
4	2	Quality and Reliability	1		1			3
4	2	Management and Legislation in Telecom and Electronics	1		1			3
Diploma Project								
4	2	Activity for Diploma Project Preparation					4	5

4	2	Practice for Diploma Project					30	5
Facultative subjects								
4	1	Automotive electronics	2		1			3
4	1	Practical Activity S7					30	2
4	1	Peripherals equipment	2		1			2

OTHER INFORMATION

All subjects of the program are open for Erasmus incoming students. This study program is EUR-ACE certified since 2017.

WEBSITE:	http://ing.pub.ro/wp-content/uploads/2014/11/12_ETTI_L_ELA-EN_2017-2021.pdf
CONTACT PERSON:	Mr. Bogdan FLOREA

Électronique appliquée (enseigné en Français)

FACULTY: Ingénierie en Langues Étrangères

DESCRIPTION COURTE ET OBJECTIVES PRINCIPAUX

Le diplôme en électronique appliquée s'adresse aux étudiants attirés par électronique, télécommunications et technologies de l'information, avec tous ses sous-domaines et applications. La formation couvre un spectre large et pluridisciplinaire dans le domaine des ordinateurs et de la technologie de l'information : procédures de maintenance de systèmes d'information, procédures d'entretien de systèmes d'information, audiovisuel électronique, optronique, électronique, techniques de communication, système d'information et de communication, outils bureautiques, méthode de classement et d'archivage, électromécanique, programmation et développement d'applications mobiles. La spécialisation a de nombreux atouts: les étudiants trouvent facilement un travail à la fin des études, la promotion de la mobilité étudiante, par l'envoi d'étudiants à l'étranger pour des périodes de pratique en entreprises, de perfectionnement linguistique et d'études dans des universités partenaires, mais aussi par l'accueil d'étudiants étrangers, la création pour les étudiants étrangers de conditions pour commencer directement les études, sans l'obligation de l'apprentissage du roumain au préalable. La spécialisation bénéficie également de la présence d'experts de l'industrie, qui interviennent dans les cours théoriques de la faculté.

CURRICULA

Année d' étude	Sem	Sujet	Nombres des heures par semaine				Stage	ECTS
			Cours	TD	TP	Projet		
BAC+1 Sujets obligatoires								
1	1	Analyse mathématique 1	2	2				4
1	1	Algébre linéaire et géometrie desciptive	2	2				4

1	1	Bases de l'électrotechnique 1	2		1			3
1	1	Chimie générale	2	1				3
1	1	Systèmes d'exploitation 1	1		2			4
1	1	Programmation des ordinateurs et langages de programmation	2		2			4
1	1	Graphique assistée par ordinateur	1		1			2
1	1	Expression et communication 1	1	1				2
1	1	Éducation physique et sport I		1				2
1	1	Techniques et systèmes de travail collaboratif 1		2				2
1	2	Analyse mathématique 2	2	2				4
1	2	Physique I	2	1	1			4
1	2	Dispositifs électroniques	2		1			4
1	2	Technologies de programmation Internet 1	2		2			4
1	2	Expression et communication 2	1	1				2
1	2	Structures de données et algorithmes	2		2			4
1	2	Bases de l'électrotechnique 2	2		2			4
1	2	Éducation physique et sport 2			1			2
1	2	Techniques et systèmes de travail collaboratif 2			2			2
Sujets optionnelles								
1	1	Langue étrangère 1		2				2
1	1	Langue française pour les ingénieurs	1	1				2
1	1	Langue et culture roumaine pour les étudiants étrangers 1		2				2
1	2	Culture et civilization europeenne		2				2
1	2	Langue étrangère 2		2				2
1	2	Langue et culture roumaine pour les étudiants étrangers 2		2				2
BAC+2 Sujets obligatoires								
2	1	Mathématiques spéciales 1	2	2				4
2	1	Probabilités et statistiques	2	2				3
2	1	Physique 2	2		1			4
2	1	Modèles SPICE	1		1			2
2	1	Programmation orientée objets	2		2			4
2	1	Microéconomie	1	1				2
2	1	Circuits fundament aux électroniques	2		1			3
2	1	Bases de données	2	1	1			4
2	2	Mathématiques spéciales 2	2	2				4
2	2	Circuits intégrésnumériques	2		1			4
2	2	Architecture des microprocesseurs	2		2			4
2	2	Méthodes numériques	2		2			4
2	2	Systèmes d'exploitation 2	2	1	1			4

2	2	Mesures électroniques, capteurs et traducteurs (conception corps solides)	1		1			4
2	2	Automates, langages formels et compilateurs	2		2			3
2	2	Macroéconomie	1	1				2
Sujets au choix (un sujet obligatoire parmi les deux)								
2	1	Traitement des documents techniques / Traitement de documents et services Internet		2				2
2	2	Compatibilité électromagnetique / Bases de l'électrotechnique 3	2		1			4
Sujets optionnelles								
2	1	Langue étrangère 3		2				2
2	1	Langue et culture roumaine pour les étudiants étrangers 3		2				2
2	1	Éducation physique et sport 3		2				2
2	1	Traitement avancés des documents techniques		2				2
2	2	Éducation physique et sport 4		2				2
2	2	Langue et culture roumaine pour les étudiants étrangers 4		2				2
2	2	Langue étrangère 4		2				2
BAC+3 Sujets obligatoires								
3	1	Architecture des ordinateurs	2		2			4
3	1	Transmission de données	2		1			4
3	1	Réseaux d'ordinateurs	2		2			4
3	1	Systèmes de réglage automatique	2		1			4
3	1	Projet: Circuits intégrés numériques			2			2
3	1	Administration des affaires	1	1				2
3	1	Théorie des signaux et des systèmes	2	1	1			4
3	1	Bases des systèmes d'acquisition des données	2		1			4
3	2	Interface homme machine	2		1			3
3	2	Microcontrolleurs	2		2			2
3	2	Électronique de puissance	2		1	1		3
3	2	Circuits intégrés analogiques	1		1			2
3	2	Théorie et traitement numériques des signaux	2		1	1		3
3	2	Fondements du management	1	1				2
3	2	Matériaux pour genie éléctrique	2	1	1			3
3	2	Pratique de domaine					30	4
3	2	Pratique de spécialité					30	4
Sujets au choix (un sujet obligatoire parmi les deux)								
3	1	Installations et appareillag es électriques/ Genie Logiciel	2		1			2

3	2	Fiabilité et controle de la qualité/ Systèmes programmables avec FPGA	1		1			2
3	2	Techologies de programmationen Internet 2/ Systèmes de communications	2		1			2
Sujets optionnelles								
3	2	Technologie des microsensors (Dispozitive MEMS)	2		1			3
3	2	Méthodes et techniques de développement des logiciels	3		1	1		4
BAC+4 Sujets obligatoires								
4	1	Projet: Réseaux d'ordinateurs			2			2
4	1	Analyse et traitementsd'images	2		1			4
4	1	CAO et commande des systèmes automates	2		1			3
4	1	Systèmes de transmissions par multiplexage	2		1			3
4	1	Management du projet	1		1			2
4	1	Sécurité et cryptage	2		1	1		4
4	2	Développement des applications pour les platformes mobiles	2		1	1		4
4	2	Théorie statistique des signax	2	1				4
4	2	Robotique et agents intelligents	2		1			3
4	2	Automatisation en électronique et télécommunications	2		1			3
4	2	Préparation du projet de fin d'études					60	5
4	2	Pratique pour le projet de fin d'études					60	5
Sujets au choix (un sujet obligatoire parmi les deux)								
4	1	Instrumentation électronique de mésure/ Architecture des réseaux et Internet/ Bioinformatique	2		1	1		4
4	2	Ingénierie des systems/ Décision et estimation dans le traitement des informations	2		1			2
4	1	Identification et commande des systèmes automates/ /Communications mobiles et par satellite/ Technologies Web et Semantique Web	2		1	1		4
4	1	Machines éléctriques et entrainements/ /Internet des dispositifs intelligents/ Réseaux de neurones et algorithmes génétiques	2		1			4
4	**2**	Commande des convertisseurs statiques/ Systèmes asservis nonlinéaires	2		1	1		4
Sujets optionnelles								
4	1	Architectures matérielsre configurables	2		1			3
4	1	Systèmes embarqués	2		1			3

4	1	Systèmes de controle intelligent	2		1			3
4	2	Electronique et informatique industrielle	2		1			3

AUTRE INFORMATION

Tous les sujets du programme sont enseignés en Français et ils sont ouvertes aux étudiants Erasmus, sauf le stage pratique qui se déroule pendant l'été.
Le programme se déroule sur une période de 4 années, chacune ayant 2 semestres. Il faut avoir 240 ECTS obligatoires pour obtenir son diplôme.
Une présentation du programme est disponible au lien suivant

WEBSITE:	http://ing.pub.ro/fr/education/licence
CONTACT PERSON:	Mr. Constantin Viorel MARIAN

Applied electronics / Angewandte Elektronik (taught in German)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The mission of the program is to help future engineers to develop competencies in a range from classical to modern disciplines of electronics. The ability of the future engineer in applied electronics to adapt to a diversity of problems based on the knowledge of basic functional blocs and instruments, is essential.

The program is both research and application oriented. Interdisciplinary courses, such as economics or project management, prepare the graduates for management roles. Our graduates find well paid and challenging jobs at all levels and in all industrial sectors, in small and middle high tech, as well as in international companies.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Mathematik 1a	2	2	-	-		3
1	1	Mathematik 1b	2	2				3
1	1	Physik	2		2	-		4
1	1	Angewandte Informatik 1	2		1	-		3
1	1	Computergraphik	1			2		3

1	1	Allgemeine Wirtschaftslehre	0			-		2
1	1	Grundlagen der Elektrotechnik 1	2	1	1	-		4
1	1	Buchführung	2			-		3
1	1	Datenbanken 1		2				3
1	2	Mathematik 2	4	2				
1	2	Informatik 2	2		2			6
1	2	Komponenten und passive Schaltkreise	2		2			4
1	2	Deutsch Interkulturell 1		2				4
1	2	Halbleiterbau elemente	2		2			2
1	2	Grundlagen der Elektrotechnik 2	2	1	1			4
1	2	Sport 1		2				5
		Elective subjects						
1	1	Fachkommunikation 1		2				2
1	1	Expression et communication 1		2				2
1	2	Fachkommunikation 2		2				2
1	2	Expression et communication 2		2				2
		Facultative subjects						
1	1	Erziehungspsychologie (in rumänischer Sprache)	2	-	-	-		2
1	1	Landeskunde 1		2				2
		Second Year Compulsory subjects						
2	1	Mathematik 3 für ETiT	4	2				6
2	1	Programmierung von Computern und Programmiersprachen	2		3			5
2	**1**	Messungen in Elektronik und Telekommunikation	**2**		**2**			**4**
2	**1**	Signale und Systeme	**3**			1		**4**
2	**1**	Labview	**1**		**2**			**4**
2	**1**	Matlab	**2**		**2**			**5**
2	**2**	Sensoren und Aktuatoren	**2**		**2**			**3**
2	**2**	Grundlagen der Mechanik und Mechanismen	**2**	2				**4**
2	**2**	Digitalsignalverarbeitung	**2**		**2**			**4**

2	**2**	CAD Technik			**2**			**2**
2	**2**	Alternative Energiequellen	**2**	1				**3**
2	**2**	Marketing	**2**					**2**
2	**2**	Elektronische Grundschaltungen	**2**					**3**
2	**2**	Spice-Modelle	**1**		**2**			**5**
2	**2**	Projektseminar:Elektronische Grundschaltungen				2		**2**
		Elective subjects						
2	1	Unternehmenskommunikation 1	2					2
2	1	Wirtschaftsenglisch 1	2					2
2	2	Unternehmenskommunikation 2		2				2
2	2	Langue francais pour ingenieurs		2			C	2
		Facultative subjects						
2	1	Landeskunde 2		2				2
2	1	Fredsprache		2				2
2	1	Sport 2		2				2
		Third Year Compulsory subjects						
3	1	Regelungstechnik 1	3	1				4
3	1	Logischer Entwurf	3	1	1			5
3	1	Leistungselektronik	3		2			5
3	1	Elektrische Antriebe	2		2			4
3	1	Grundlagen der Nachrichtentechnik	3	1				5
3	2	Numerische Berechnungsverfahren	1	2				3
3	2	Analoge Schaltungen	2	2	2			5
3	2	Kommunikationstechnik	3		1			3
3	2	Projektseminar:Entwurf eingebetteter Systeme				2		2
3	2	Rechnersysteme 1	2	2				4
3	2	Werkstoffe der Elektrotechnik	2		2			3
3	2	Technisches Praktikum					240	4
3	2	Technisches Praktikum					120	4

		Elective Subjects						
3	1	Moderieren und Präsentieren		2				2
3	1	Einführung in das wissenschaftliche Arbeiten		2				2
3	1	Datenstrukturen und Betriebssysteme	2	2				5
3	1	Die Grundlagen von Datenerfassungssystemen	2	2				5
3	2	Softwaresysteme	2	2				2
3	2	Bionik	2	2				2
		Facultative subjects						
3	1	Pädagogik 1 (in rumänischer Sprache)	2	2				4
3	1	General Management		4				4
3	2	EBCL		3				3
3	2	Pädagogik 2 (in rumänischer Sprache)	2					2
		Fourth Year Compulsory subjects						
4	1	Kommunikationsnetze	3	2			E	5
4	1	Rechnersysteme 2	2		2		E	4
4	1	Regelungstechnik 2	2				E	4
4	1	Projektseminar Regelungstechnik 2				2	C	4
4	1	Hochfrequenztechnik	2	1	1		E	2
4	1	Projektmanagement	2	2			E	4
4	1	Technologie hochintegrierter Schaltungen	2		1		E	3
4	2	Embedded Systems	2		2		C	2
4	2	Kommunikationssysteme	2		2		C	2
4	2	Mikroelektronik	2		2		C	2
4	2	Computernetze	2		2		C	2
4	2	Erarbeitung Bachelor Thesis					8	5
4	2	Praktikum Bachelor Thesis						5
		Elective Subjects						
4	1	Kollaborative Techniken und Systeme	2		2		C	4
4	1	Internet-Programmiertechnologien	2		2		C	4
4	2	Bearbeitung von technischen Dokumenten	2				C	2

4	2	Dokumentenverarbeitung und Internetdienste	2				C	2
4	2	Qualität und Zuverlässigkeit	2				C	3
4	2	Zuverlässigkeit	2				C	3
Facultative subjects								
4	1	Unterrichtspraktikum (in rumänischer Sprache)				2		2
4	1	Methodik des Faches (in rumänischer Sprache)	2					2
4	2	Business Plan		2				2
4	2	Europäische Studien	2					2

OTHER INFORMATION

All the courses of the program are open for Erasmus incoming students and the program has incoming and outgoing Erasmus students for one or two semesters each year.

The bachelor program is carried out in cooperation with companies such as Siemens, Infineon, Hornbach, IBM, P&G, Honeywell, Lidl, HP, Microsoft.

The Bachelor Thesis can be carried out in cooperation with enterprises or foreign universities.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mrs. Ioana Guica

Master programs

Advanced microelectronics (taught in English)

FACULTY: Electronics, Telecommunications and Information Technology

DESCRIPTION AND MAIN OBJECTIVES

The Advanced Microelectronics (AM) program offers a systematic and coherent frame for Mixed Signal Circuits Design and Application studies. The AM graduate will be able to work independently or guided by the project leader in the Microsystems Design and Application. The AM program provides the knowledge for Analog and Mixed Signal Circuits and Microsystems analysis, design and evaluation for both
(1) Silicon implementations up to System on Chip level and
(2) Specific application development from prototype level up to finite product.
The AM master program responds to the Romanian and international labor market strong demand for analog and mixed signal circuits and systems designers, with a strong emphasis on automotive applications.

CURRICULUM

			Weekly number of hours	

Year	Sem	Subject name	Lecture	Tutorial	Lab work	Project	ECTS
1	1	Analog Blocks	3		2		5
1	1	Microcontrollers and Embedded Systems	2		2		5
1	1	CAD for Integrated Circuits Design	2		1		4
1	1	Digital System Design: Project 1				2	3
1	1	Automotive Electronics: An Industrial View	2				3
1	1	Research Activity and Practical Work S1	12				10
1	2	Digital System Design: Project 2				2	3
1	2	Advanced Digital Design	2		1		4
1	2	Automotive Sensors - Infineon	2				3
1	2	Power Electronic Circuits	2		2	1	5
1	2	Advanced Analog Blocks	3		2		5
1	2	Research Activity and Practical Work S2	11				10
2	3	Advanced Analog Blocks				2	3
2	3	Advanced Electronics for Cars	2		1		4
2	3	RF IC Design	2		2		5
2	3	Management of Microelectronics Projects	2		1		3
2	3	Special Topics in Analog and Smart Power Design, Infineon	2				3
2	3	Integrating Research Project				1	2
2	3	Research Activity and Practical Work S3	12				10
2	4	Practical work, scientific Research (Master Thesis preparation)	28				30

OTHER INFORMATION

The master program is development in partnership with Infineon Technologies.
All the courses of the program are open for Erasmus incoming students.

WEBSITE:	http://www.electronica.pub.ro/images/continut/admitere/master at/04-prezentare.pdf
CONTACT PERSON:	Prof. Dr. Ing. Claudius DAN

Advanced wireless communications (taught in English)

FACULTY: Electronics, Telecommunications and Information Technology

DESCRIPTION AND MAIN OBJECTIVES

To provide the theoretical and applied knowledge for engineers in the field of wireless communications. They should have a vision at the system level and conduct designing procedures by highlighting different levels of a wireless system or a wireless communications network, from the physical layer to the application layer. The focus will be particularly on the physical layer, which has to get an adequate level of reliability of the communication link that ensure the required level of application quality of service (QoS) as well as mobility. Due to the special dynamics of the concerned areas, it is aimed at combining all principle aspects regarding the latest technological trends. These objectives can be achieved through:

- Increasing knowledge of the electronic and telecommunications bachelors (graduated engineers) in the field of radio communications;
- Creating conditions for exchanging both students and teachers between universities and for putting them in touch to the latest concerns in Europe and the world by developing teaching in English;
- Attracting major economic players in the industry (operators, equipment development companies, application developers, regulatory bodies and other companies interested in wireless communications and mobility access systems) in preparing students in this field.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Optimization Techniques and Random Signals in Telecommunications	2		1		4
1	1	Advanced Communication Networks, Protocols and Services	2		1		4
1	1	Advanced Digital Signal Processing Techniques	2		1		4
1	1	Mobile Communications Systems	2		1	1	4
1	1	Cryptography and Security in Communication Networks	2			1	4
1	1	Research Activity and Practical Work S1	12				10
1	2	Advanced Data Transmission Technologies	2		1		4
1	2	Access and Broadcasting Digital Radio Technologies	2		1	1	4

1	2	Software Defined Radio and Programmable Circuits Design	2		1		3
1	2	Digital Video and Multimedia Processing	2			1	3
1	2	Embedded Systems	2		1		4
1	2	Advanced Telecommunications Networks - Project				1	2
1	2	Research Activity and Practical Work S2	12				10
2	3	Advanced Procedures in Wireless Communications	2		1		4
2	3	Software for Integrated Management and Control of Networks and Services	2		1		4
2	3	Software Applications for Mobile Terminals	2		1		4
2	3	Satellite Communications	2			1	3
2	3	Fiber Optics Communications	2			1	3
2	3	Integrating Research Project				1	2
2	3	Research Activity and Practical Work S3	12				10
2	4	Practical work, scientific Research (Master Thesis preparation)	28				30

OTHER INFORMATION

Based on some informal discussions Orange and FreeScale are interested in the development of this program.
All the courses of the program are open for Erasmus incoming students.

WEBSITE:	http://www.electronica.pub.ro/images/continut/admitere/masterat/Prezentare_Master_AWT.pdf
CONTACT PERSON:	Prof. Dr. Ing. Ioan Marghescu

Advanced Computing in Embedded Systems (taught in English)

FACULTY: Electronics, Telecommunications and Information Technology

DESCRIPTION AND MAIN OBJECTIVES

In order to reflect the recent trends in the electronics industry, offer cutting-edge knowledge to students and support research programs, the Advanced Computing in Embedded Systems Master's Program is devoted to the following fields of study and research:

- Parallel Computing
- Distributed Computing
- Energy-Aware Computing
- Embedded Computing

- Embedded System Design

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Operating systems	2		3		6
1	1	Microcontrollers and embedded systems	2		2		5
1	1	Parallel computing	2		3		6
1	1	Digital system design: Project 1				2	3
1	1	Partially Supervised Scientific Research I	12				10
1	2	Reconfigurable computing	2		2		5
1	2	Software development process and testing	2		3		6
1	2	Performance analysis and optimization	2		3		6
1	2	Digital system design: Project 2				2	3
1	2	Partially Supervised Scientific Research II	12				10
2	3	Distributed and High-Performance Computing	2		2		5
2	3	Wireless Sensor Networks and the Internet of Things	2		2		5
2	3	Compilers for HW Designers	2		2		5
2	3	Functional Verification	2		2		5
2	3	Partially Supervised Scientific Research III	12				10
2	4	Practical work, scientific Research (Master Thesis preparation)	28				30

OTHER INFORMATION

Joining this program provides an opportunity to work within the CERN-Atlas project on digital design or software engineering tasks, both in embedded systems, and high-level software.

Also, our master students will meet several of our partner companies: AMIQ Consulting, Tremend, Gemini Solutions and others.

WEBSITE:	https://www.dcae.pub.ro/en/master/2/aces/
CONTACT PERSON:	Mr. Radu Hobincu

Electric Vehicle Propulsion and Control (taught in English)

FACULTY: Electronics, Telecommunications and Information Technology

DESCRIPTION AND MAIN OBJECTIVES

This Master Program is aiming to:

- increase the quality of education of engineers in the field of automotive engineering;
- stimulate the research in the field of automotive engineering at the University POLITEHNICA of Bucharest.
- develop even more the collaboration between the University POLITEHNICA of Bucharest and the industrial environment, in particular with the companies dealing with the development of automotive engineering - Renault, Continental.
- encourage collaboration between the research teams of the faculties of Electronics, Telecommunications and Information Technology (ETTI), Automation andComputers (AC) and Electrical Engineering.
- maintain and develop the international collaboration

Joining this program provides an opportunity for the students to be a part of an Erasmus-Mundus project – https://master-epico.ec-nantes.fr/, where UPB is one of the partners.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Evaluation form (E/C)	ECTS
			Lecture	Tutorial	Labwork	Project		
1	1	Electric Vehicle Modelling and Simulation	2	0	1	0	E	4
1	1	Statistical Signal Processing and Estimation Theory	2	0	1	0	E	4
1	1	Control Systems	2	0	2	0	E	4
1	1	Fundamentals of Electric Vehicle Systems	1	0	1	0	E	3
1	1	Research Methodology	1	0	1	0	V	3
1	1	Project: Embedded Systems	0	0	0	2	V	2
1	1	Partially Supervised Scientific Research I	12				A/R	10
1	2	Power Electronic Converters	1	0	2		E	3
1	2	Electrical Machines	2	0	1		E	4
1	2	Renewable Energy and Storage Systems	1	0	1	0	V	3
1	2	Nonlinear Control Systems	1	0	2	0	V	3
1	2	Machine Learning for Autonomous Systems	2	0	1	0	E	4

1	2	Partially Supervised Scientific Research II	12				A/R	10
2	3	Battery Chargers	2	0	1	0	E	4
2	3	Energy Storage Requirements	2	0	1	0	E	4
2	3	Battery Management Systems and Battery Life Cycle	2	0	1	0	E	4
2	3	Sensorless Control of Electrical Machines	2	0	1	0	V	4
2	3	Microprocessor Applications for Real Time Systems	1	0	1	0	E	4
2	3	Partially Supervised Scientific Research III	12				A/R	10
2	4	Practical work, scientific Research (Master Thesis preparation)	28				C	30

OTHER INFORMATION

WEBSITE:	https://www.youtube.com/watch?v=ZbbGxUBeV14&ab_channel=FacultateaETTI
CONTACT PERSON:	Conf. dr. ing. Octaviana DATCU Prof. dr. ing. Dan Alexandru STOICHESCU

Intelligent Transport Systems (taught in English)

FACULTY: Faculty of Transport – Telematics and Electronics for Transport Department

DESCRIPTION AND MAIN OBJECTIVES

The master program in Intelligent Transport Systems provides the advanced studies on ITS as well as on applications of IT, communications, and electronics in the field of transportsystems. The main objective is to educate students to design intelligent transport systems and to apply all these systems in mobility, transforming this in a smart mobility as main component of the smart city.

Learning outcomes:

- Knowledge and skills to design intelligent transport systems from ITS architecture to installation of hardware and software components.
- Knowledge and skills to apply intelligent transport systems in mobility having as main objectives: increasing safety, reducing pollution and environmental impact of transport activities, and increasing the efficiency of transport and economic activities.
- Knowledge and skills in using software technology and tools applied in mobility and transport systems.
- Knowledge and skills in conducting research activities and management of ITS projects as well as risk management for ITS deployment.
- Knowledge and skills in designing smart solutions for urban mobility and specifictransport systems in urban areas.
- Knowledge and skills in designing components and system for connected and automated mobility.

Career development perspectives:

- Intelligent Transport Systems specialist
- Smart Mobility specialist
- Specialist in ITS tools for urban mobility
- Specialist in digitalization of transport systems
- Research assistant in ITS and smart mobility
- Teaching assistant in ITS and smart mobility

CURRICULA

Year	Semester	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Intelligent Transport Systems - Fundamentals	2	0	1	0	4
1	1	Information Technology	2	0	2	0	3
1	1	Project - Information Technology	0	0	0	1	2
1	1	Intelligent Transport Systems' Architectures	2	0	2	0	4
1	1	Project - Intelligent Transport Systems' Architectures	0	0	0	1	3
1	1	Connected Vehicles and Mobility	2	0	0	1	4
1	1	Scientific and Applicative Research I	12				10
1st Semester							30
1	2	Navigation, Dynamic Guidance and Autonomous Driving	2	0	2	0	5
1	2	Project - Navigation, Dynamic Guidance and Autonomous Driving	0	0	0	1	2
1	2	Software Tools for Traffic Analysis and Simulation	2	0	2	0	5
1	2	Project - Software Tools for Traffic Analysis and Simulation	0	0	0	1	2
1	2	Risk Management in Intelligent Transport Systems	2	0	0	0	3
1	2	Smart and Sustainable Mobility	1	0	1	0	3
1	2	Scientific and Applicative Research II	12				10
2nd Semester							30
2	3	Advanced Mobile Networks	2	0	2	0	4
2	3	Project - Advanced Mobile Networks	0	0	0	1	2
2	3	Artificial Intelligence - Applications in Intelligent Transport Systems	2	0	1	1	5
2	3	Intelligent Infrastructure	2	0	1	1	5
2	3	Scientific and applicative research III	12				10
		Development and Management of ITS Projects	2	0	0	0	2

Optional 1		Project - Development and Management of ITS Projects	0	0	0	1	2
Optional 2		Traffic and Travel Management and Information Systems	2	0	0	0	2
		Project - Traffic and Travel Management and Information Systems	0	0	0	1	2
3rd Semester							30
2	4	Ethics	1	0	0	0	2
2	4	Scientific research, practice, and dissertation elaboration	0	0	0	27	28
4th Semester							30
Total 2 years – 4 semesters							120

OTHER INFORMATION

Erasmus agreements with European universities – students and professors exchanges in thefield of Intelligent Transport Systems.
Institutional agreements with main players from ITS & Smart Mobility industry.

WEBSITE:	http://tet.pub.ro/
CONTACT PERSON:	Associate Professor Florin Nemtanu

DOMAIN: AEROSPACE ENGINEERING

Bachelor programs

Air Navigation (taught in English)

FACULTY: Aerospace Engineering

DESCRIPTION AND MAIN OBJECTIVES

The program provides theoretical and applied knowledge for engineers in the field of aerospace engineering. Air Navigation was established in 2009, with the objective to cover the needs of the modern civil aviation and aligned to the International Civil Aviation Organization – Next Generation of Aviation Professionals (ICAO NGAP) strategy. The program includes the process of planning and controlling the movement of an aircraft and mechanical engineering.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Differential and Integral Calculus	2	2				4
1	1	Algebra	2	2				4
1	1	Programming Languages 1	2		2			4
1	1	Aircraft Materials	2		2			4
1	1	Atmosphere Physics	2	1				4
1	1	Descriptive Geometry	2		2			4
1	1	Aviation English 1		2				2
1	2	Geometry	2	2				4
1	2	Mechanics (Matter, Statics, Kinematics)	2	1	1			4
1	2	Programming Languages 2	2		2			4
1	2	Engineering Drawings, Diagrams, Standards	2		2			4
1	2	Electrical Fundamentals	2	2				4
1	2	Meteorology	2		1			4

1	2	Aviation English 2		2				2
		Optional Subjects						
1	1	Geomatics	2	1				4
1	1	Astronomy	2	1				4
1	2	Aviation Legislation and Regulations	2	1				4
1	2	Aviation International and National Requirements	2	1				4
		Second Year Compulsory subjects						
2	1	Differential Equations	2	2				4
2	1	Solid Dynamics	2	2				4
2	1	Fluid Dynamics	2	1	1			4
2	1	Electrical Machines	2	1	1			4
2	1	Mechanical Engineering	2	1				4
2	1	Fundamentals of Navigation	2	1				3
2	2	Statistics and Probability Theory	2	2				4
2	2	Calculus (Numerical Methods)	2		2			4
2	2	Microprocessors and Microcontrollers	2		1			4
2	2	Aerodynamics and Theory of Flight	2	1	1			4
2	2	Strength of Materials	2		2			4
2	2	Electronic Circuits	2		2			4
2	2	Aeronautical Charts	1	1				3
		Optional Subjects						
2	1	Human Factors	1	2				3
2	1	Human Performance	1	2				3
2	1	Programming Languages 3	1	1		1		4
2	1	Software Engineering	1	1		1		4
2	2	Optics and Acoustics	2		1			3
2	2	Vibrations and Noise	2		1			3
		Third Year Compulsory subjects						
3	1	Thermodynamics	2	2				4
3	1	Flight Dynamics and Stability	2			2		4
3	1	Digital Avionics	2	1	1			4
3	1	Composite Materials	2		2			4
3	1	Business Strategy	2	1				4

3	1	Electrical Power Systems	2		2			4
3	1	Aeronautical Information	1		1			3
3	2	Electronic Flight Instrument Systems	2		1			3
3	2	Flight Controls	2	2				3
3	2	Aircraft Structure and Systems	2	2				3
3	2	Financial Accounting	2	2				3
3	2	Interchange of Aeronautical Data	2		2			3
3	2	Airport Operations and Navigation	2	1				3
3	2	Navigation Systems Databases	1	1				3
3	2	Internship (30 hours/week *12 weeks)					30	6
		Optional Subjects						
3	1	Safety Analysis	1	1				3
3	1	Quality Assurance	1	1				3
3	2	Aviation Databases	2			1		3
3	2	Computer Interfacing	2			1		3
		Fourth Year Compulsory subjects						
4	1	Systems Engineering 1	2	1				4
4	1	Automatic Flight Control	2	1		1		3
4	1	Turbine Engines	2		2			4
4	1	Air Navigation Services	2	1				4
4	1	Radio Navigation Systems	2		2			3
4	1	Flight Operations	1	1				2
4	1	Aircraft Maintenance	2	1				3
4	1	Project Preparation 1				3		4
4	2	Systems Engineering 2	2	1				3
4	2	Avionics Integrated Systems	2	2				4
4	2	Management	2	2				4
4	2	Surveillance Systems (Radars)	2	1	1			4
4	2	Air Traffic Management	2	2				4
4	2	Environmental Aviation	1	1				2
4	2	Procedures for Air Navigation Services OPS	1	1				2

4	2	Project Preparation 2				4		4
		Optional Subjects						
4	1	Financial Management	2	1				3
4	1	Financial Analysis	2	1				3
4	2	Accident Investigation	2	2				3
4	2	Systemic Occurrence Analysis	2	2				3

OTHER INFORMATION

All the courses of the program are open for Erasmus incoming students.

WEBSITE:	http://www.aero.pub.ro/wordpress/index.php/en/bachelor-programs-2/
CONTACT PERSON:	Mr. Octavian Thor PLETER

Master programs

Air transport engineering (taught in English)

FACULTY: Aerospace Engineering

DESCRIPTION AND MAIN OBJECTIVES

Air Transport Engineering (ATE) is a master of Aerospace Engineering program taught in English, addressed to bachelor of Aerospace Engineering graduates but not only, interested in the dynamic field of Air Transport. Duration of studies is 2 Years (4 Semesters), with 240 ECTS. The students are engaged in scientific research with an individual supervisor. At the end of each semester, a research report is presented to a scientific board. The program ends with a dissertation thesis and exam.
Air Transport Engineering was established in 2013, with the objective to be adapted to the needs of current civil aviation and aligned to the International Civil Aviation Organization – Next Generation of Aviation Professionals (ICAO NGAP) strategy. The curricula were decided by AirNav Board, a think tank consisting of high profile graduates of the Faculty of Aerospace Engineering.
The ATE program is multidisciplinary and its approach to complexity is holistic and systemic (understanding the aircraft as a system of systems and as a part of the air transport system).

CURRICULA

Year	**Sem**	**Subject name**	**Weekly number of hours**				**ECTS**
			Lecture	**Tutorial**	**Labwork**	**Project**	
1	1	Aircraft Performance	2	-	2	-	5
1	1	Automatic Flight Control Systems	2	-	2	-	5

1	1	Aerodynamics	2	-	2	-	5
1	1	Noise and Vibrations	2	-	2	-	5
1	1	Scientific Research and Internship 1	-	-	-	12	10
1	2	Computational Fluid Dynamics	2	-	2	-	5
1	2	Air Traffic Management Automation	2	-	2	-	5
1	2	Computer Networking and Data Link	2	-	2	-	5
1	2	Metal Stress and Fatigue	2	-	2	-	5
1	2	Scientific Research and Internship 2	-	-	-	12	10
2	3	Structural Design	2	-	2	-	5
2	3	Propulsion Systems	2	-	2	-	5
2	3	Advanced Safety and Human Factors Methods and Tools	2	-	2	-	5
2	3	Radio Technology	2	-	2	-	5
2	3	Scientific Research and Internship 3	-	-	-	10	10
2	4	Scientific Research, Internship and Dissertation	-	-	-	27	30
2	4	Ethics	1	-	-	-	2

OTHER INFORMATION

This program yearly receives incoming Erasmus + and other foreign students for one semester or one entire year.
We have a very strong partnership with EUROCONTROL and other European and Romanian companies working in Air Transport Engineering and other related fields.
We encourage and offer possibilities to our master students to develop master thesis with industrial partners.

WEBSITE:	http://www.aero.pub.ro/files/ATEsyllabus120.pdf
CONTACT PERSON:	Assoc. Prof. Octavian Thor PLETER, D

DOMAIN: COMPUTERS AND INFORMATION TECHNOLOGY

Bachelor programs

Ingénierie de l'Information (enseigné en Français)

FACULTY: Faculté d'Ingénierie en Langues Etrangères

DESCRIPTION COURTE ET OBJECTIVES PRINCIPAUX

Le diplôme en génie de l'information s'adresse aux étudiants attirés par les technologies de l'information, avec tous ses sous-domaines et applications. La formation couvre un spectre large et pluridisciplinaire dans le domaine des ordinateurs et de la technologie de l'information: micro-informatique, informatique, algorithmiques, électronique, langages de programmation, procédures relatives aux licences et garanties, procédures d'entretien de matériel informatique, règles de sécurité, télécoms, protection des données numériques, Logiciels de Gestion de Maintenance Assistée par Ordinateur (GMAO), logiciels de gestion de parc informatique, intelligence artificielle, applications web et mobiles.

La spécialisation a de nombreux atouts: les étudiants trouvent facilement un travail à la fin des études, la promotion de la mobilité étudiante, par l'envoi d'étudiants à l'étranger pour des périodes de pratique en entreprises, de perfectionnement linguistique et d'études dans des universités partenaires, mais aussi par l'accueil d'étudiants étrangers, la création pour les étudiants étrangers de conditions pour commencer directement les études, sans l'obligation de l'apprentissage du roumain au préalable. La spécialisation bénéficie également de la présence d'experts de l'industrie, qui interviennent dans les cours théoriques de la faculté.

Le plan d'enseignement est conçu d'une manière à couvrir et assurer le développement des compétences fondamentales de base pour un ingénieur, des compétences complémentaires, linguistiques et de l'économie.

AUTRE INFORMATION

Tous les sujets du programme sont enseignés en Français et ils sont ouvertes aux étudiants Erasmus, sauf le stage pratique qui se déroule pendant l'été.

Le programme se déroule sur une période de 4 années, chacune ayant 2 semestres. Il faut avoir 240 ECTS obligatoires pour obtenir son diplôme.

Une présentation du programme est disponible au lien suivant:

WEBSITE:	http://ing.pub.ro/fr/education/licence/
CONTACT PERSON:	Mme. Maria-Iuliana Dascalu

CURRICULUM

Anm	Sem	Sujet	Nombres des heures par semaine				Stag	ECTS
			Cours	TD	TP	Projet		
BAC+1 Sujets obligatoires								
1	1	Analyse I	2	2				4
1	1	Algébre linéaire	2	2				4
1	1	Bases de l'électrotechnique 1	2		1			3
1	1	Chimie Générale	2	1				3
1	1	Systèmes d'exploitation 1	1		2			4
1	1	Langages de programmation	2		2			4
1	1	Graphique assistée par ordinateur	1		1			2
1	1	Expression et communication 1	1	1				2
1	1	Éducation physique et sport I		1				2
1	1	Techniques et sytèmes de travail collaboratif 1		2				2
1	2	Analyse mathématique 2	2	2				4
1	2	Physique I	2	1	1			4
1	2	Dispositifs électroniques	2		1			4
1	2	Programmation en Web	2		2			4
1	2	Expression et communication 2	1	1				2
1	2	Structures de données et algorithmes	2		2			4
1	2	Bases de l'électrotechnique 2	2		2			4
1	2	Éducation physique et sport 2			1			2
1	2	Techniques et systèmes de travail collaboratif 2			2			2
Sujets optionnelles								
1	1	Langue étrangère 1		2				2
1	1	Langue française pour les ingénieurs	1	1				2
1	1	Langue et culture roumaine pour les étudiants étrangers 1		2				2
1	2	Culture et civilization européenne		2				2
1	2	Langue étrangère 2		2				2
1	2	Langue et culture roumaine pour les étudiants étrangers 2		2				2
BAC+2 Sujets obligatoires								
2	1	Mathématiques spéciales 1	2	2				4
2	1	Probabilités et statistiques	2	2				4
2	1	Physique 2	2		1			4
2	1	Programmation orientée objets	2		2			4
2	1	Microéconomie	1	1				2
2	1	Circuits fondamentaux électroniques	2		1			4
2	1	Bases de données	2	1	1			4

2	2	Mathématiques spéciales 2	2	2				4
2	2	Circuits intégrés numériques	2		1			4
2	2	Architecture des microprocesseurs	2		2			4
2	2	Méthodes numériques	2		2			4
2	2	Systèmes d'exploitation 2	2	1	1			4
2	2	Mesures électroniques, capteurs et traducteurs (conception corps solides)	1		1			2
2	2	Automates, langages formels et compilateurs	2		2			4
2	2	Macroéconomie	1	1				2
Sujets au choix (un sujet obligatoire parmi les deux)								
2	1	Acquisition et traitement de données/ Conception des algorithmes	2		1			4
2	2	Traitement des documents techniques 2/ Traitement de documents et services Internet/ Bases de l'électrotechnique 3		2				2
Sujets optionnelles								
2	1	Langue étrangère 3		2				2
2	1	Langue et culture roumaine pour les étudiants étrangers 3		2				2
2	1	Éducation physique et sport 3		2				2
2	1	Traitements avancés des documents techniques		2				2
2	2	Éducation physique et sport 4		2				2
2	2	Langue et culture roumaine pour les étudiants étrangers 4		2				2
2	2	Langue étrangère 4		2				2
BAC+3 Sujets obligatoires								
3	1	Architecture des ordinateurs	2		2			4
3	1	Systemes de traitement graphique	2		2			4
3	1	Réseaux d'ordinateurs	2		2			4
3	1	Programmation fonctionnelle	2		2			4
3	1	Théorie des signaux et des systèmes	2	1	1			4
3	1	Administration des affaires	1	1				2
3	1	Transmission de données	2		1			4
3	2	Développement des applications Web	2		1	1		3
3	2	Interface homme machine	2		1			2
3	2	Administration des bases de données	2		1	1		3
3	2	Projet: Programmation orientée objets				2		2
3	2	Théorie et traitement numériques des signaux	2	1	1			3
3	2	Fondements du management	1	1				2
3	2	Méthodes et techniques de développement des logiciels	2		1	1		3
3	2	Pratique de domaine					30	4

3	2	Pratique de spécialité					30	4
Sujets au choix (un sujet obligatoire parmi les deux)								
3	1	Systèmes de réglage automatique/ Technologie des microsensors (Dispozitive MEMS)	2		1			4
3	2	Fiabilité et controle de la qualité/ Systèmes programmables avec FPGA	1		1			2
3	2	Réseaux de neurones et algorithmes génétiques/ Apprentissage automatique	2		1			2
Sujets optionnelles								
3	2	Systèmes de controle automate	2		1			3
3	2	Instrumentation virtuelle	2		1	1		4
BAC+4 Sujets obligatoires								
4	1	Projet: Developpement des applications Web			2			2
4	1	Analyse et traitements d'images	2		1			4
4	1	Intelligence artificielle	2		1			4
4	1	Génielogiciel	2		1	1		4
4	1	Sécurité et cryptage	2		1	1		4
4	2	Développement des applications pour les platformes mobiles	2		1	1		4
4	2	Hacking éthique et défense du système	2		1			4
4	2	Robotique et agents intelligents	2		1			3
4	2	Management des projets logiciels	2		1	1		3
4	2	Préparation du projet de fin d'études					60	5
4	2	Pratique pour le projet de fin d'études					60	5
Sujets au choix (un sujet obligatoire parmi les deux)								
4	1	Semantique Web/ Systèmes de communications/ Théorie statistique des signaux	2		1	1		4
4	1	Commerce électronique et sécurité des systèmes de paiement électronique/ /Communications mobiles et par satellite/ Bioinformatique	2		1	1		4
4	1	Techniques d'optimisation des systems/ Internet des dispositifs intelligents/ /Réalité virtuelle et augmeentée	2		1	1		4
4	2	Ingénierie des systems/ Systèmes à microprocesseur	2		1			2
4	2	Paradigmes de programmation/ Algorithmes parallèles et distribués	2		1			4
Sujets optionnelles								
4	1	Architectures matériels reconfigurables	2		1			3
4	1	Systèmes embarqués	2		1			3
4	1	Systèmes de controle intelligent	2		1			3
4	2	Électronique et informatique	2		1			3

		industrielle						

Information Engineering (taught in English)

FACULTY: Faculty of Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The Information Engineering bachelor program, taught entirely in English, offers the abilities and knowledge to apply the best techniques and methods for designing and implementing high quality, safe, performant enterprise-level information systems based on advanced technologies. Graduates will also achieve strong foundations in electronics and system engineering, and the ability to participate in the development of complex cyber- physical systems.

OTHER INFORMATION

All the courses of the program are open for Erasmus incoming students.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mr. Andrei VASILĂȚEANU

CURRICULUM

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Calculus 1	3	2				5
1	1	Linear Algebra	2	2				4
1	1	Fundamentals of Electrical Engineering 1	2	1				3
1	1	Chemistry	2	1				3
1	1	Operating Systems Administration	2		2			4
1	1	Programming Languages	2		2			4
1	1	Computer Aided Graphics	1		1			3
1	1	Professional communication 1		2				2
1	1	Physical Education 1			1			2
1	2	Calculus 2	3	2				5
1	2	Physics 1	2	1	1			4
1	2	Fundamentals of Electrical Engineering 2	2	2				5
1	2	Electronic Devices	2	1	1			4
1	2	Data Structures and Algorithms	2		2			4
1	2	Introduction to Web Programming	2		2			4

1	2	Professional communication 2		2				2
1	2	Physical Education 2			1			2
Facultative subjects								
1	1	European Culture and Civilization 1	1	1				2
1	1	Foreign language 1	1	1				2
1	1	English for Engineering Academic Study 1	1	1				2
1	1	Romanian language for foreign students 1		2				2
1	1	Education psychology	2	2				5
1	2	European Culture and Civilization 2	1	1				2
1	2	Foreign language 2	1	1				2
1	2	English for Engineering Academic Study 2	1	1				2
1	2	Romanian language for foreign students 2		2				2
1	2	Pedagogy 1	2	2				5
Second Year Compulsory subjects								
2	1	Special Mathematics 1	2	2				4
2	1	Probabilities & Statistics	2	1				3
2	1	Physics II	2		1			4
2	1	Electronic Circuits	2		1			4
2	1	Digital Integrated Circuits	2		2			4
2	1	Databases	2		1	1		5
2	1	Object Oriented Programming	2		2			4
2	1	Microeconomics	1	1				4
2	2	Microprocessor Architecture	2		2			4
2	2	Signals and Systems	2	1	1			5
2	2	Fundamentals of Electrical Engineering 3	2		2			4
2	2	Numerical Methods	2		2			5
2	2	Operating Systems	3	1	1			5
2	2	Electronic Measurements, Sensors and Transducers	3		2			5
2	2	Macroeconomics	1	1				2
Facultative subjects								
2	1	Technical Writing 1		2				2
2	1	Romanian language for foreign students 3		2				2
2	1	Foreign Language 3		2				2

2	1	Physical Education 3			2			2
2	1	Pedagogy 2	2	2		2		5
2	2	Technical Writing 2		2				2
2	2	Romanian language for foreign students 4		2				2
2	2	Foreign Language 4		2				2
2	2	Physical Education 4			2			2
2	2	Didactics	2	2				5
Third Year Compulsory subjects								
3	1	Data Transmissions	2		1			4
3	1	Algorithm Design	2		1			4
3	1	Computer Networks	3		2			5
3	1	Formal Languages and Compilers	3		2			4
3	1	Advanced Computer Graphics	1		2			4
3	1	Money and Banking	1	1				2
3	1	Computer Architecture	2		2			4
3	2	Digital Signal Processing	2		1	1		3
3	2	Neural Networks and Genetic Algorithms	2		2			3
3	2	Functional Programming	2		2			3
3	2	Business Administration	1	1				2
3	2	Software Development Methods	2		1	1		3
3	2	Web Application Development	2		1	1		3
3	2	Project: Object Oriented Programming				2		2
3	2	Domain Internship					30	4
3	2	Specialty Internship					30	4
Optional Subjects								
3	1	Quality and Reliability	2		1			3
3	1	Mobile Device Application Development	2		1			3
3	2	Internet of Things	2		1	1		3
3	2	Human-Computer Interaction	2		1	1		3
Facultative subjects								
3	2	Ethics and Academic Integrity	2					2
Fourth Year Compulsory subjects								
4	1	Project: Web and Cloud Applications				2		2

4	1	Bioinformatics	2		2			4
4	1	Software Engineering	2		1	1		4
4	1	Software Design Techniques	2		1	1		5
4	1	Fundamentals of Management	1	1				2
4	2	Semantic Web	2		1	1		5
4	2	Distributed and parallel algorithms	2		1	1		5
4	2	Software Project Management	2		1	1		3
4	2	Security and Encryption	2		1			2
4	2	Industrial Management	1	1				2
4	2	Diploma Project				8		4
4	2	Diploma Project Practice					60	5
Optional Subjects								
4	1	Artificial Intelligence	2		1	1		5
4	1	Image Processing	2		1	1		5
4	1	Programmable Electronic Systems with FPGA	2		1	1		4
4	1	Systems Engineering	2		1	1		4
4	1	Mobile Systems and Programming for Wireless Networks	2		1	1		4
4	1	Microprocessor Systems	2		1	1		4
4	2	Robotics and virtual reality	2		1			4
4	2	Electronic CAD	2		1			4

Internet of Things Engineering (taught in English)

FACULTY: Faculty of Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The Internet of Things Engineering bachelor program, taught entirely in English, offers the abilities and knowledge to apply the best techniques and methods for managing the security of complex, distributed systems, to use best practices for the design and implementation of enterprise systems, including heterogenous software and hardware components.

Graduates will also acquire a strong foundation in artificial intelligence, networking and electronics allowing them to participate in the development of Internet of Things systems.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	Evaluation form (E/C)	ECTS
			Lecture	Tutorial	Labwork	Project			
First Year Compulsory subjects									
1	1	Calculus 1	2	1	1			E	4
1	1	Linear Algebra	2	2				E	4
1	1	Fundamentals of Electrical Engineering 1	2	1	1			E	4
1	1	Foreign Language 1		1				C	2
1	1	Operating Systems Utilization	2		2			V	4
1	1	Programming Languages 1	2		2			E	4
1	1	Computer Aided Graphics	1		2			C	3
1	1	Mechanics and Mechanism Theory	2	1				E	3
1	1	Physical education and sports 1		1				C	2
1	2	Calculus 2	2	1	1			E	4
1	2	Physics 1	2	1	1			E	4
1	2	Electronic devices	2		2			E	4
1	2	Logic Design	1		1			C	2
1	2	Programming Languages 2	2		2			E	4
1	2	Data Structures and Algorithms	2		2			E	4
1	2	Web Programming	2		2			E	4
1	2	Physical education and sports 2			1			C	2
1	2	Foreign Language 2		1				C	2
Facultative subjects									
1	1	European Culture and Civilization 1	1	1				C	2
1	1	English for Engineering Academic Study 1	1	1				C	2
1	1	Romanian language for foreign students 1		2				C	2
1	1	Education psychology	2	2				C	5
1	2	European Culture and Civilization 2	1	1				C	2
1	2	English for Engineering Academic Study 2	1	1				C	2
1	2	Romanian language for foreign students 2		2				C	2
1	2	Pedagogy 1	2	2				E	5
Second Year Compulsory subjects									
2	1	Special Mathematics	2	2				E	4
2	1	Probabilities & Statistics	2	1				E	3
2	1	Physics 2	2		1			E	3
2	1	Object Oriented Programming	2		2			E	4

2	1	Microeconomics	1	1				C	2
2	1	Digital Electronics	2		2			C	4
2	1	Databases	2		1	1		E	4
2	1	Foreign Language 3		1				C	2
2	2	Macroeconomics	1	1				E	3
2	2	Formal Languages, Automata and Compilers	2		2			E	4
2	2	Numerical Methods	2		2			E	4
2	2	Operating Systems	2		1	1		E	4
2	2	Foreign Language 4		2				C	2
2	2	Algorithm Design	2		2			E	4
2	2	Systems and Signals Theory	2	1	1			C	5
Optional subjects									
2	1	Data Acquisition and Processing	2		1			E	4
2	1	Virtual Instrumentation	2		1			E	4
2	2	Electronic Measurement Sensors and Transducers	2		2			E	4
2	2	Fundamentals of Electrical Engineering 2	2		2			E	4
Facultative subjects									
2	1	Technical Writing 1		2				C	2
2	1	Romanian language for foreign students 3		2				C	2
2	1	Physical Education 3			2			C	2
2	1	Pedagogy 2	2	2		2		E	5
2	2	Technical Writing 2		2				C	2
2	2	Romanian language for foreign students 4		2				C	2
2	2	Physical Education 4			2			C	2
2	2	Didactics	2	2				E	5
Third Year Compulsory subjects									
3	1	Digital Signal Processing	2		2			E	4
3	1	Data Analysis and Visualization	2		1			E	4
3	1	Computer Networks	2		2			E	4
3	1	Image Processing	2		1			C	4
3	1	Software Engineering	2		2			E	4
3	1	Artificial Intelligence	2		2			C	4
3	1	Computer Architecture	2		2			E	4

3	2	Intelligent Systems Engineering	2		1	1		E	3
3	2	Applied Cryptography	2		2			E	3
3	2	Computer Graphics	2		1			E	2
3	2	Project: Computer Networks				2		C	2
3	2	Intelligent electricity distribution networks	2		1			E	2
3	2	Deep Learning	2		1			C	3
3	2	Logical Programming and Functional Programming	2		1	1		E	3
3	2	Digital marketing	1		1			E	2
3	2	Internship					180	C	8
Optional Subjects									
3	1	Accounting and Financial Information	1	1				C	2
3	1	Rights - judicial tools for engineers	1	1				C	2
3	2	Modern Industrial Logistic	2		1			C	2
3	2	Nanotechnology for IoT Industry	2		1			C	2
3	2	Robotics and Multi-Agents Systems	2		1			C	2
Facultative subjects									
3	1	Computer Aided Training	1		1			C	2
Fourth Year Compulsory subjects									
4	1	Interdisciplinary project				2		C	2
4	1	Internet of Things	2		1			E	4
4	1	Design with Microprocessors	2		1			C	4
4	1	Mobile and Embedded Computing	2		1	1		E	4
4	1	Applications & Software Design	2		2			E	4
4	2	Autonomous Systems	2		1	1		C	4
4	2	Ethical Hacking and System Defense	2		2			C	4
4	2	Virtual and Augmented Reality	2		1			C	3
4	2	Entrepreneurship in Industry 4.0	2		1			C	3
4	2	Diploma Project Elaboration				8		C	5
4	2	Diploma Project Internship					60	C	5
Optional Subjects									
4	1	E-payment Systems Security	2		2			E	4
4	1	Decision Support Systems	2		2			E	4
4	1	Big Data Analytics	2		2			E	4

4	1	Mobile Communications in Industry 4.0	2		2			E	4
4	1	Semantic Web and Open linked data	2		2			E	4
4	1	IoT Systems Evaluation	2		2			E	4
4	1	Nonlinear Control Systems	2		2			E	4
4	1	Smart City	2		2			E	4
4	2	Bioinformatics	2		1			C	2
4	2	Key Standards in Health Information Systems	2		1			C	2
4	2	Environmental impact and ecological concept of IoT products	2			1		C	4
4	2	IoT Project Management	2			1		C	4
Facultative subjects									
4	1	Sensing and Actuation from Devices in IoT	2		1			C	3
4	1	Cybersecurity	2		1	1		C	4

OTHER INFORMATION

All subjects of the program are open for Erasmus incoming students.

WEBSITE: http://ing.pub.ro/en/education/licence/

CONTACT PERSON: Mrs. Iuliana MARIN

Ingénierie de l'Internet des dispositifs intelligents (enseigné en Français)

FACULTY: Faculté d'Ingénierie en Langues Étrangères

DESCRIPTION AND MAIN OBJECTIVES

Le programme d'étude se retrouve en Roumanie seulement à l'UPB, à la Faculté d'Ingénierie en Langue Étrangères. Il s'inscrit dans le domaine des ordinateurs et technologie de l'information. Il offre les capacités et les connaissances nécessaires pour appliquer les meilleures techniques et méthodes de gestion de la sécurité de systèmes complexes et distribués, afin d'utiliser les meilleures pratiques pour la conception et la mise en œuvre de systèmes d'entreprise, y compris hétérogènes. Composants logiciels et matériels. Les diplômés posséderont également de bonnes bases en intelligence artificielle, en réseau et en électronique leur permettant de participer au développement des systèmes de l'Internet des objets.

La spécialisation a de nombreux atouts: les étudiants trouvent facilement un travail à la fin des études, la promotion de la mobilité étudiante, par l'envoi d'étudiants à l'étranger pour des périodes de pratique en entreprises, de perfectionnement linguistique et d'études dans des universités partenaires, mais aussi par l'accueil d'étudiants étrangers, la création pour les étudiants étrangers de conditions pour commencer directement les études, sans l'obligation de l'apprentissage du roumain au préalable. La spécialisation bénéficie également de la présence Le plan d'enseignement est conçu d'une

manière à couvrir et assurer le développement des compétences fondamentales de base pour un ingénieur, des compétences complémentaires, linguistiques et de l'économie.

CURRICULA

Année d'étude	Sem	Sujet	Nombres des heures par semaine				Stage	Forme d'évaluation (E/C)	ECTS
			Cours	Tutoriel	Laboratoi	Projet			
Premier an: Disciplines obligatoires									
1	1	Analyse mathématique 1	2	1	1			E	4
1	1	Algébre linéaire	2	2				E	4
1	1	Électrotechnique 1	2	1	1			E	4
1	1	Langue étrangère 1		1				C	2
1	1	Utilisation des systèmes d'exploitation	2		2			V	4
1	1	Langages de programmation 1	2		2			E	4
1	1	Graphique assistée par ordinateur	1		2			C	3
1	1	Mécanique et théorie des mécanismes	2	1				E	3
1	1	Éducation physique et sport 1		1				C	2
1	2	Analyse mathématique 2	2	1	1			E	4
1	2	Physique 1	2	1	1			E	4
1	2	Dispositifs électroniques	2		2			E	4
1	2	Conception logique	1		1			C	2
1	2	Langages de programmation 2	2		2			E	4
1	2	Structures de données et algorithmes	2		2			E	4
1	2	Programmation en Web	2		2			E	4
1	2	Éducation physique et sport 2			1			C	2
1	2	Langue étrangère 2		1				C	2
Matières facultatives									
1	1	Expression et communication 1	1	1				C	2
1	1	Langue et culture roumaine pour les étudiants étrangers 1		2				C	2
1	1	Psyhologie de l'éducation	2	2				C	5
1	2	Expression et communication 2	1	1				C	2
1	2	Langue et culture roumaine pour les étudiants étrangers 2		2				C	2
1	2	Pédagogie 1	2	2				E	5

Deuxième année: Matières obligatoires									
2	1	Mathématiques spéciales	2	2				E	4
2	1	Probabilités et statistiques	2	1				E	3
2	1	Physique 2	2		1			E	3
2	1	Programmation orientée objets	2		2			E	4
2	1	Microéconomie	1	1				C	2
2	1	Electronique numèriques	2		2			C	4
2	1	Bases de données	2		1	1		E	4
2	1	Langue étrangère 3		1				C	2
2	2	Macroéconomie	1	1				E	3
2	2	Automates, langage formels et compilateurs	2		2			E	4
2	2	Méthodes numériques	2		2			E	4
2	2	Systèmes d'exploitation	2		1	1		E	4
2	2	Langue étrangère 4		2				C	2
2	2	Conception des algorithmes	2		2			E	4
2	2	Théorie des systèmes et des signaux	2	1	1			C	5
Matières optionnelles									
2	1	Acquisition et traitement de données	2		1			E	4
2	1	Intsrumentation virtuelle	2		1			E	4
2	2	Mesures électroniques, capteurs et transducteurs	2		2			E	4
2	2	Électrotechnique	2		2			E	4
Matière facultative									
2	1	Traitement avancés des documents techniques 1		2				C	2
2	1	Langue et culture roumaine pour les étudiants étrangers 3		2				C	2
2	1	Éducation physique et sport 3			2			C	2
2	1	Pédagogie 2	2	2		2		E	5
2	2	Traitement avancés des documents techniques 2		2				C	2
2	2	Langue et culture roumaine pour les étudiants étrangers 4		2				C	2
2	2	Éducation physique et sport 4			2			C	2
2	2	Didactique de la spécialité	2	2				E	5

Troisième annéee Matières obligatoires									
3	1	Traitement numériques des signaux	2		2			E	4
3	1	Analyse et visualisation de données	2		1			E	4
3	1	Réseaux d'ordinateurs	2		2			E	4
3	1	Traitements d' images	2		1			C	4
3	1	Génie logiciels	2		2			E	4
3	1	Intelligence artificielle	2		2			C	4
3	1	Architecture des ordinateurs	2		2			E	4
3	2	Ingénierie des systèmes intelligents	2		1	1		E	3
3	2	Cryptographie appliquée	2		2			E	3
3	2	Traitement graphique	2		1			E	2
3	2	Projet: Réseaux d'ordinateurs				2		C	2
3	2	Réseaux intelligents	2		1			E	2
3	2	L'apprentissage en profondeur	2		1			C	3
3	2	Programmation logique et programmation fonctionelle	2		1	1		E	3
3	2	Marketing numerique	1		1			E	2
3	2	Pratique					180	C	8
Matières optionnelles									
3	1	Comptabilité et informations financière	1	1				C	2
3	1	Droit – outils juridiques pour l'ingénieur	1	1				C	2
3	2	Logistique industrielle moderne	2		1			C	2
3	2	Nanotechnologies pour l'industrie IoT	2		1			C	2
3	2	Robotique et systemes multiagents	2		1			C	2
Matières facultatives									
3	1	Formation asssitée par ordinateur	1		1			C	2
4-ème année: Matières obligatoires									
4	1	Projet interdisciplinaire				2		C	2
4	1	Internet des dispositifs intelligents	2		1			E	4
4	1	Conception avec des microprocesseurs	2		1			C	4
4	1	Informatique Mobile et Embarquée	2		1	1		E	4
4	1	Conception des systemes du génie logiciel et des applications	2		2			E	4
4	2	Systèmes autonomes	2		1	1		C	4

4	2	Hacking éthique et défense du système	2		2			C	4
4	2	Réalité virtuelle et augmeentée	2		1			C	3
4	2	Entrepreneuriat dans l'industrie 4.0	2		1			C	3
4	2	Préparation du projet de fin d'études				8		C	5
4	2	Pratique pour le projet de fin d'études					60	C	5
Matières optionnelles									
4	1	Sécurité des systèmes électroniques de paiement	2		2			E	4
4	1	Systèmes d'aide à la décision	2		2			E	4
4	1	Analyse des données des grandes dimensions	2		2			E	4
4	1	Communications mobiles dans l'industrie 4.0	2		2			E	4
4	1	Web Semantique et Données liées	2		2			E	4
4	1	Évaluation des systèmes IoI	2		2			E	4
4	1	Système de contrôle non-linéaires	2		2			E	4
4	1	Ville intelligente	2		2			E	4
4	2	Bioinformatique	2		1			C	2
4	2	Principales normes des systèmes d'information sur la santé	2		1			C	2
4	2	Impact envirnnmental et conception propres des prodits IoT	2			1		C	4
4	2	Gestion des projets IoT	2			1		C	4
Matières facultatives									
4	1	Détection et activation à partir dispositifs en IoT	2		1			C	3
4	1	Sécurité cybernetique	2		1	1		C	4

OTHER INFORMATION

Tous les sujets du programme sont enseignés en Français et ils sont ouvertes aux étudiants Erasmus, sauf le stage pratique qui se déroule pendant l'été.

Le programme se déroule sur une période de 4 années, chacune ayant 2 semestres. Il faut avoir 240 ECTS obligatoires pour obtenir son diplôme.

Une présentation du programme est disponible au lien suivant:

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mrs. Iulia Cristina STĂNICĂ

Master programs

Artificial Intelligence (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

The M.Sc. programme in Artificial Intelligence offers to the enrolled students in-depth theoretical and practical knowledge on artificial intelligence and intelligent applications, distributed problem solving, machine learning, computer vision, games and strategies, intelligent agents and their applications, social networks, search and filtering of information on the Web, data mining, innovative ways to represent and use data, natural language processing. It focuses on the design and implementation of state-of-the-art artificial intelligence systems, offering both computer science and engineering skills.
The programme offers the students, in each of the first three semesters, three compulsory courses and one elective, which can be selected from other master programmes taught in English offered by the Faculty of Automatic Control and Computers or by other programmes of the university, subject to the approval of the programme coordinator.
Pre-requisites: Knowledge of programming languages, algorithms, operating systems, data bases, computer systems architectures.
Career perspectives
With a Master's degree in artificial intelligence the graduates will be welcomed by companies working in intelligent systems, machine learning, data mining and big data, language technology, social media analytics, and many other leading edge topics of information technology.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Knowledge Representation	2		2		5
1	1	Computer Vision	2			2	5
1	1	Data Mining	2			2	5
1	1	Elective course	2		2		5
1	1	Research activities				12	10
1	2	Multi-agent Systems	2		2		5
1	2	Natural Language Processing	2			2	5
1	2	Symbolic and Statistical Learning	2			2	5
1	2	Elective course	2			2	5
1	2	Research activities				12	10
2	3	Neural Networks	2			2	5
2	3	Self-organizing Systems	2			2	5
2	3	Advanced Topics in Artificial Intelligence	2			2	5
2	3	Elective course	2			2	5
2	3	Research activities				12	10

2	4	Practical work, scientific Research (Master Thesis preparation)				28	30

OTHER INFORMATION

- 10 partnerships with Romanian and multi-national ITC companies
- 9 Erasmus agreements with EU universities
- 23 incoming Erasmus students during the period 2013-2017

WEBSITE:	http://acs.pub.ro/en/academics/master-of-science-studies/ http://aimas.cs.pub.ro/master_ai/
CONTACT PERSON:	Adina Magda Florea

Parallel and distributed computer systems (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

This MSc Program aims to train experts in parallel and distributed computer systems. Subjects include the design, development, deployment, evaluation, and analysis of modern parallel and distributed systems, and their applications. The content includes state-of-the-art topics and real-world techniques. Such techniques keep evolving as part of a very dynamic domain that experiments, validates, and promotes innovative solutions at the frontline of high-tech science and engineering.

Relevance for the industry

Parallel and distributed approaches are vital today to respond to the increasingly large numberand type of applications processing high-volume, high-velocity data and simulating complex processes. Moreover, rapid technological advancements in the field of parallel and distributed systems (and related areas) have already led to cheap and widely accessible off-the-shelf solutions. A natural consequence is the increasing need for specialists in parallel and distributed computer systems. This MSc Program aims to train high-quality, deeply profiled experts who seek to pursue leading careers in the high-tech industry or in academic/industrial research centers. Prominent companies in this field include the US-headquartered Google, Amazon, Facebook, Apple, Microsoft, and IBM, and the Chinese companies Baidu, Alibaba, and Tencent, plus numerous European-based companies of smaller but still sizable scale.

Requirements

Basic (BSc-level) knowledge and practical skills related to Computer Programming, Algorithms, Operating Systems, Computer Networking, Computer Organization and Architecture.

Skills acquired through this program

Students will gain knowledge and practical skills related to Parallel and Distributed Architectures (including grid, cloud, edge, and peer-to-peer computing) as well as provable expertise in the design, development, deployment, evaluation, analysis, and modern applications of parallel and distributed systems. They will also learn about the current and emerging challenges in the field, the state-of-the-art solutions, including key aspects of

performance, scalability, elasticity, fault tolerance, and security of parallel and distributed systems.

Programing languages and technologies

Java, C, C++, MPI, OpenMP, TBB, Cuda, OpenCL, MapReduce, Hadoop, Spark, Flink, Android.

Research subjects (examples)

Distributed systems monitoring, data gathering, filtering, cleaning, aggregation and storage. Batch and real-time processing, predictions, and decision making, task scheduling and resource management, and performance analysis; Design of systems, architectures, mechanisms, and protocols for parallel and distributed computer systems. Design of experimental methods, procedures, and instruments for parallel and distributed computersystems. Security, anonymity, and privacy.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Parallel Programming	2			2	5
1	1	Computer and Network Security	2			2	5
1	1	Introduction to Big Data	2			2	5
1	1	Elective course	2			2	5
1	1	Research activities				12	10
1	2	Distributed Systems	2			2	5
1	2	Cluster and Grid Computing	2		2		5
1	2	Distributed Algorithms	2			2	5
1	2	Elective course	2			2	5
1	2	Research activities				12	10
2	3	Advanced Topics in Computer and Network Security	2			2	5
2	3	Mobile Operating Systems (practical)	2			2	5
2	3	Dependable Systems	2			2	5
2	3	Elective course	2			2	5

OTHER INFORMATION

Short track: for the second year, the students can apply to study at VU Amsterdam. The students will defend their Master thesis at both VU and UPB, and will receive diplomas from both sides.

WEBSITE:	http://acs.pub.ro/en/academics/master-of-science-studies/
CONTACT PERSON:	**Mr. Florin Pop**

Software Engineering (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

Some of the most difficult and challenging problems in industry and commerce are associated with software development. Software has become an increasingly important element of many products that are developed today. There has been a shift in costs from hardware development to software solutions development. This increases the need to be able to develop software products with accurate functionality, of high quality, on time and on budget.
Software Engineering, as a technological branch of Computing Science, establishes principles and engineering methods to be used in order to produce such software products. It is traditionally designed to bridge industry and research needs. This is why Software Engineering is in a privileged position on the job market.
The Master of Science Program on Software Engineering (MSE) at the Faculty of Engineering Taught in Foreign Language of the Politehnica University introduces a postgraduate degree to meet these challenges by educating software developers in advanced software engineering concepts that cover the entire development chain, from inception to delivery, from the business management perspective to technical management and development perspectives. MSE aims to produce software engineering industry leaders and key agents of change to improve practices in the field, as it evolves. The program is project and research oriented. This means that students have a large choice of projects and research themes to develop.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Advanced Concepts in Software Engineering	2		1		4
1	1	Programming Paradigms	2		1	1	4
1	1	Game and Interactive Simulation Systems	1		2		4
1	1	Formal Models in Software Engineering	1		1	1	4
1	1	Technologies for Big Data Analysis	2		1		4
1	1	Research 1	12				10
1	2	Model Driven Software Engineering	2		1		4
1	2	Distributed Software Engineering	2		1	1	4
1	2	Software Methodologies	2		1		4
1	2	Computing in the Semantic Web	2			1	4
1	2	Advanced Topics in Computer Networks	1		1	1	4
1	2	Research 2	12				10
2	3	Software Architectures	2		1	1	4
2	3	Software Project Management	2		1	1	5

2	3	Agent-Oriented Software Engineering	2		1		4
2	3	Special Topics in Software Engineering	1		1		3
2	3	Software Testing	2		1		4
2	3	Research 3	12				10
2	4	Ethics	1				2
2	4	Practical work, scientific Research (Master Thesis preparation)					28

OTHER INFORMATION

There are numerous Erasmus exchanges at the level of the Master, possibility to develop master thesis together with industry companies.

WEBSITE:	http://ing.pub.ro/en/masterat-in-ingineria-programelor/
CONTACT PERSON:	prof. Nicolae GOGA

Advanced Cybersecurity (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

The "Advanced Cybersecurity" (AC) master program aims at training highly qualified specialists in the field of cybersecurity. From a professional point of view, the master programdevelops engineering skills in identifying vulnerabilities, risks and cyber threats, as well as scientific skills in carrying out research projects in the field at European level. The master also aims to develop the professional autonomy of students and their ability to social interaction, transversal skills essential to further career development in both academia and the IT&C industry.

Electronic services are the basis of the main ICT applications offered to users via the Internet. Thus, the challenge faced by an information security / cyber security manager is not only to monitor information systems and ensure their security, but also to achieve integration into complex systems, such as critical infrastructures, which, in turn, they must be protected, thus ensuring cyber security, which becomes an integral part of national security. The AC maser program covers the main methods used for advanced data encryption, the most common tools and methods for detecting and managing cyber attacks, the fundamental principles of an organization's cyber security, seen as a stand-alone entity and as an integral part of aninterconnected system. lonal, national and even regional level.

The AC master program will provision students with advanced techniques for the prevention and detection of cyber attacks, security audits and implementation of information security management systems. In this context, students have the opportunity to research specialized methods of in-depth analysis (forensics), using dedicated equipment and tools. Students inthis master's program will interpret the impact of various types of attacks on integrated information systems (computers, smart devices, communications networks, etc.) by developing their own monitoring, detection and response tools or by integrating variousexisting applications.

A major area of research for the AC master program is the creation of applications for monitoring and detecting possible anomalies in integrated information systems. This categoryincludes the creation of new applications that ensure security and safety up to the service level. Given the rapid evolution of online services, online access and personal user devices, the program prepares students to identify new challenges, finding the right methods

and toolsfor solving, analyzing and improving the performance of these complex systems.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Applied Cryptography	2		2		5
1	1	Security Protocols	2		2		5
1	1	Critical InfrastructureCybersecurity	2			2	5
1	1	Security of Informational Systems	2		2		5
1	1	Research activities				12	10
1	2	Security in Cloud andGrid Computing	2		2		5
1	2	Cyber-defence andCyber intelligence. Cyber security Techniques	2		2		5
1	2	Security of MobileDevices	2		2		5
1	2	Privacy EnhancingTechnologies	2		2		5
1	2	Research activities				12	10
2	3	Cryptographic Devices Design usingFPGA	2		1	1	5
2	3	CybersecurityIncidents Management	2			2	5
2	3	Information SecurityManagement	2		1	1	5
2	3	Elective course	2			2	5
2	3	Research activities				12	10

OTHER INFORMATION

WEBSITE:

CONTACT PERSON: **Mr.** Nicolae Țăpuș

Mr. Nicolae Țăpuș

Financial Computing (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

The Master of Science in Financial Computing program has the mission to train specialists in the field

of Computer Science and Engineering which intend to build a career in the domainof Finance and Banking. The program combines in its curriculum advanced elements of Computer Science which are necessary to specialists working in Banking and Financial Technology (FinTech), as well as introductory Finance elements, and also elements of soft skills.

Graduates will be well prepared to work in corporations and in large, international teams, responsible with developing complex software solutions, especially in Finance and Banking. A hands-on approach is taken in teaching students how to get from an idea to the deployment and maintenance of a complete software solution.

Pre-requisites: Knowledge of programming languages, algorithms, basics of machine learning, data bases.

Career perspectives: With a Master's degree in Financial Computing graduates will be welcome in companies working in financial technologies, or developing software for banks and financial institutions. However, knowledge and experience gathered in designing, developing, deploying and maintaining complex software solutions can be useful in any software development company.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Introduction to Financial Market Analysis	2	2			5
1	1	Data Mining for Computational Finance	2		2		5
1	1	Banking Software Design	2		2		5
1	1	Elective subject 1	2		2		5
1	1	Research activities				12	10
1	2	Banking System Software Life Cycle	2			2	5
1	2	Processes, products and services for finance and banking	2		2		5
1	2	Self-discovery and Effective communication (soft skills)	2	2			5
1	2	Elective subject 2	2		2		5
1	2	Research activities				12	10
2	3	Industry Expert Lectures in Finance	2			2	5
2	3	Applied Human Computer Interaction	2		2		5
2	3	Machine Learning and Computational Intelligence	2		2		5
2	3	Big-Data Fundamentals and Analytics	2		2		5
2	3	Research activities and preparation of Master Thesis				12	10
2	4	Ethics				1	2

2	4	Research activities and preparation of Master Thesis				27	28

OTHER INFORMATION

The Master program has been created and is being developed in partnership with DB Global Technology, Deutsche Bank's technology centre in Central and Eastern Europe.
Half of the subjects taught are taught in collaboration with specialists from DB GlobalTechnology.

WEBSITE:	http://aimas.cs.pub.ro/financial-computing/ https://www.facebook.com/FinCompACS/
CONTACT PERSON:	Mr. Andrei Olaru

Information Technologies Applied in Aviation (taught in English)

FACULTY: Automatic Control and Computer Science (UNESCO)

DESCRIPTION AND MAIN OBJECTIVES

This master programme strongly focuses on digitalization of air transport, ensuring cross- disciplinary knowledge and abilities in aviation and ICT, a holistic understanding of ICT options and methods applied in aviation.

Students will acquire learning outcomes for developing, analyzing and managing innovative and advanced ITC systems for air transport industry.

The master ensures knowledge and skills for challenging current and new interdisciplinary jobs in air transport, such as: Chief IoT, Data architect, Cybersecurity engineer, Environmental Analyst, Virtualization engineer, Developer, Responsible with digital data, Data Scientist, Airport UX Designer, UX Manager, UI Designer, Ergonomist Designer, CRM Responsible, Data Analyst, E-reputation Manager, SEO Consultant, Chief Data Officer, Data-Miner. For all these jobs, this master programme ensure IT learning outcomes (knowledgeand skills) applied in aviation.

CURRICULA

Year	**Sem**	**Subject name**	**Weekly number of hours**				**ECTS**
			Lecture	**Tutorial**	**Labwork**	**Project**	
1	1	Air Transport Economics	1	1	0	0	3
1	1	Strategic Management in Aviation	1	0	0	1	3
1	1	Student Research Project	0	0	0	12	10
Optional 1		Aerodynamics and Flight Mechanics	2	1	0	0	3
		Airline Operations	2	1	0	0	4
		Airport Management and Infrastructure	2	1	0	1	4
		Air Traffic Management	1	1	0	0	3
		Software Engineering	1	1	0	0	3
		System Engineering Development/ Ingineria sistemelor	2	2	0	0	4

Optional 2		Data center arhitecture/ Arhitectura centrelor de sate	2	0	0	1	3
		Smart Data Processing/ Procesarea inteligentă a datelor	2	1	0	0	4
1	2	Aviation Operations Optimization Methods	2	1	0	0	3
1	2	Modeling Theory And Tools in Aviation	1	1	0	0	3
1	2	Specific Platforms and Tools for Aviation	2	1	0	1	4
1	2	ATM Information Network Management	1	0	0	1	3
1	2	Aviation Safety Management	2	0	0	1	4
1	2	Student Research Project	0	0	0	12	10
Optional 1		Airworthiness	1	1	0	0	3
Optional 2		Intelligent Interfaces	1	1	0	0	3
2	3	Data & Decision Support Management	2	1	0	0	3
2	3	CAD/CAM Methodology	2	1	0	1	4
2	3	Computer Vision	1	1	0	0	3
2	3	Unmanned Air Vehicles and their IT Needs	1	1	0	0	3
2	3	Cybersecurity Systems Management in Aviation	1	1	0	0	3
2	3	Reliability of Hardware and Software in Aviation	2	1	0	0	4
2	3	Student Research Project	0	0	0	12	10
2	4	Student Research Project and Dissertation Preparation	0	0	0	27	28
2	4	Ethics	1	0	0	0	2

OTHER INFORMATION

The study program is carried out in line with UNESCO's mission to provide education for sustainable development and with new trends of air transport digitalization.

First-hand experience of different European planning and practices on ITC applied in aviation, is delivered by an international interdisciplinary group of professors and lecturers: University of Zagreb (Croatia), Ecole de Mines d'Albi (France), University of Strasbourg (France), University of Lisbon (Portugal), University of Zilina (Slovakia).

The UNESCO Department welcome the Erasmus + students and have agreement with Zagreb University (Croatia), Strasbourg University (France), Ecole Nationale Supérieure des Mines D'Albi-Carmaux (France), Univeristy of Paris Sud (France), University of Zilina (Slovakia).

The Master Programme is delivered with an important support from industry of air transportas for example: International Civil Aviation Organization (ICAO), COMOTI, National Company Bucharest Airports (CNAB), Menzies Aviation, DB Systel from Germany and Ministry of Transportation from Romania.

The students have the possibility to develop research in cooperation with professors and students from foreign countries and representatives of air transport industry.

WEBSITE:	http://www.unesco.chair.upb.ro
CONTACT PERSON:	Mr. Sorin Eugen ZAHARIA

Management, innovation et technologies des systèmes collaboratifs (Enseigné en Français)

FACULTY: Faculté d'Ingénierie en Langues Étrangères

DESCRIPTION AND MAIN OBJECTIVES

L'objectif principal de ce master est de fournir aux étudiants des connaissances sur l'infrastructure d'information et de communication de l'organisation moderne, sur la transformation des affaires et de la gestion sous l'impact des technologies de l'information et de la communication et, en particulier, sur le rôle stratégique des systèmes d'information en économie.

Aujourd'hui. MITSC vise à présenter et à créer des compétences de travail avec les dernières techniques, méthodes, modèles et outils pour le développement et la réalisation de produits et services dans le contexte de l'entreprise moderne dans laquelle les activités sont assistées par ordinateur. Des compétences professionnelles seront créées pour modéliser les processus d'affaires dans un environnement virtuel et collaboratif.

Modélisation de systèmes d'information complexes, de systèmes collaboratifs et de leur mise en œuvre par le biais de systèmes informatiques.

- Gestion des processus de développement des systèmes informatiques et assurance qualité des produits et services informatiques.
- Gestion des ressources humaines, gestion financière, gestion du marketing, politiqueset stratégies de gestion, gestion et sécurité de l'information.
- Gestion des produits et services informatiques conformément aux exigences du marché.

CURRICULA

An	Sem	Sujet	Heures par semaines				ECTS
			Cours	TD	TP	Projet	
1	1	Fouille de données et entrepôt de données	2		1	1	E
1	1	Management de la recherche et de l'innovation	2			2	E
1	1	Modélisation des systèmes et techniques d'optimisation	2		1	1	E
1	1	Systèmes embarqués	2		1	1	E
1	1	Recherche scientifique 1	14 semaines x 12 h				EC
1	2	Sécurité des communications et réseaux d'ordinateur	2		1	1	E
1	2	Interfaces Homme machine: Concepts, techniques et applications	2		1	1	E

1	2	Gestion des ressources humaines dans un environement virtuel	2			2	E
1	2	Technologies Web et développement des applications Web	2		1	1	E
		Computing in the Semantic Web					
1	2	Recherche scientifique 2	14 semaines x 12 h				EC
2	3	Management des systèmes informationnels	3		1	1	E
2	3	Systèmes adaptatifs et collaboratifs	2		1	1	E
2	3	Programmation génétique et réseaux de neurones	2		1	1	E
2	3	Impact environnmental et conception propre des produits	2			1	E
		Internet des dispostifs intelligents					
2	3	Recherche scientifique 3	14 semaines x 12 h				EC
2	4	Etique	1				EC
2	4	Recherche (élaboration de la thèse)	0	0	0	0	28

OTHER INFORMATION

Des échanges bilatéraux des étudiants dans des le cadre du programme Erasmus et des collaborations avec des spécialistes du domaine IT.

Recherche scientifique en gestion, innovation et technologies de l'information

WEBSITE:	http://ing.pub.ro/education/master/; http://dils.pub.ro/academic/master/
CONTACT PERSON:	M. George DRAGOI M. Dan Alexandru MITREA

DOMAIN: SYSTEMS ENGINEERING

Bachelor programs

Master programs

Service engineering and management (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

The Master program "Service Engineering and Management" responds to the present worldwide demand of service innovation. The scale and complexity of globally dispersed *service systems* is growing rapidly and the importance of using resources efficiently, effectively and in a sustainable manner is rising, as service activities become an ever greater part of value creation in modern economies.
The Master program in Service Engineering and Management (SEM) is a program to educate professional engineers, i.e. graduates will be prepared to *conceive, design, implement* and *operate* (CDIO) *complex value-added engineering systems*. SEM has a strong emphasis on:

- Understanding the innovative technologies now required for service provision.
- Understanding the functional and the experience requirements of people using services.
- Management of the service CDIO lifecycle process and understand its value.

Specific competencies are provided by three complementary hands-on training modules: ICT (Information and Communication Technologies), PSO (Psychology and Sociology), and OMM (Operations, Management and Marketing).

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Mathematical Modelling of Economic Processes	2		1		4
1	1	Data Mining and Data Warehousing	2		1		4
1	1	Architecture of Service Oriented Information Systems	2			2	4
1	1	IoT and SCADA Technologies	2		1		4
1	1	Network and Systems Security	2			1	4
1	1	Research activities				12	10
1	2	Business Process Modelling	2		2		4

1	2	Supply Chain Management and Logistics	2			2	4
1	2	Communication Management and Cognitive Psychology	2	1			4
1	2	Java Programming and Web Services	2		1		4
1	2	Accounting and Financial Management for Services	1		1		4
1	2	Research activities				12	10
2	3	Enterprise Integration and Management Architectures	2		1		4
2	3	Business Service Integration and Management	2			1	4
2	3	Knowledge Engineering and Services Ecosystem / Digital Marketing and Financial Performance of Business	2		1		4
2	3	Service Operations and Customer Relationship Management	2			2	4
2	3	Intellectual Property and Entrepreneurship	2		1		4
2	3	Research activities				12	10
2	4	Practical work, scientific Research (Master Thesis preparation)				28	30

OTHER INFORMATION

- Double degree diploma with University of Porto, Faculty of Engineering
- 20 partnerships to industry/companies (IBM Romania, SC EAST ELECTRIC SRL, SC ASTI Automation SRL, SC Cloud Troopers SRL, S_IND Process Control SRL, SC SIS SA SRL, SC Retail Management Systems SRL, SC IPA SA, etc)
- 14 incoming Erasmus students from Portugal, Spain, France in 2013-2017

WEBSITE:	http://acs.pub.ro/en/academics/master-of-science-studies/
CONTACT PERSON:	Theodor Borangiu, theodor.borangiu@cimr.pub.ro

Complex systems (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

COMPLEX IS THE NEW SIMPLE: the rapid technological advance in all fields of engineering leads to a severe increase in the complexity of the studied corresponding systems. The control systems are embedded in everyday life, but have become large-scale, highly heterogenous and complex. The modelling and control of such systems is calling for specific design procedures and algorithms tailored to their complexity and high dimension.

This program offers practical aptitudes in the design, the analysis and the control of complex systems along the rapid development of Smart systems (such as Smart Cities, Smart Energy, Smart Transportation, etc.) throughout Europe. We consider ourselves up to date with all the current result in this field and our human resource, having results of international reputation, will get you involved in

projects dealing with all the afore mentioned novel topics.

Pre-requisites: Theoretical and practical applied science engineering/economic knowledge.
At the end of the program, students will have knowledge and abilities regarding: operating with theories, concepts and scientific methods in the field of systems engineering; the aptitude of writing and reviewing scientific papers; developing algorithms for the analysis, the modelling and the simulation of complex systems; designing and implementing control algorithms for complex systems; using advanced scientific computing and information processing for big data systems, nonlinear systems and highly-dimensional systems; dealing with the scientific research of complex systems.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Introduction to Complex Systems	2			2	5
1	1	Scientific Writing	2			2	5
1	1	System of Systems Modelling and Analysis	2			2	5
1	1	Evolutionary Computing	2			2	5
1	1	Research activities				12	10
1	2	Computation for Complex Systems	2			2	5
1	2	Chaos and Fractals	2		2		5
1	2	Optimization for Big Data	2			2	5
1	2	Dimension and Complexity Reduction	2			2	5
1	2	Research activities				12	10
2	3	Complex Systems Case Studies	2			2	5
2	3	Nonlinear Control	2			2	5
2	3	Autonomous Agents	2			2	5
2	3	Control of Complex Systems	2			2	5
2	3	Research activities				12	10
2	4	Practical work, scientific Research (Master Thesis preparation)				28	30

OTHER INFORMATION

The students joining this masterprogram benefit from second year scholarships at SUPELEC and Ecole Centrale de Lille, France. The students graduate with a double degree, one from the Faculty of Automatic Control and Computer Science and another one from a foreign partner.

The program is run in collaboration with the Free University of Amsterdam and offers a double degree to master graduates.

WEBSITE:	http://acs.pub.ro/doc/master/ro/short_description/CS-short-ro.pdf

CONTACT PERSON: Mr. Cristian Oara

Robotics and Automation (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

The educational curriculum proposed by the master program "Robotics and Automation" aims at providing the skills for jobs in two domains: **automation** (solution developer, researcher, designer, consultant, deployment specialist, expert in digital process control, Cyber-Physical Production Systems architect, Industrial Internet of Things framework design and system supervisor) and **robotics** (application developer, expert in process and service robotization, integrator of robot-vision systems in digital production structures, researcher, consultant, and Cloud robot service developer).

Combining theoretical education with practice stages at companies will is an important objective to address the current gap in technical skills. The master program is also focusing onoffering more practical, hands-on teaching in advanced automation and intelligent industrial robotics in manufacturing, logistics and services. This master program has established a smartfactory on campus to allow students learning in a real-life production environment.

The development of robotic technology and robot systems requires the mastery of multiple disciplines – primarily automation, system engineering, computing architecture and software development, mechanical and electrical engineering. Graduates will have to work with the next generation of robots and shop floor devices that will be integrated with other systems in the Industrial IoT and Cyber-Physical System environments.

The specific objectives of the "Robotics and Automation master program concern:

- Training specialists that assume the roles of architect, developer and integrator of robot and automatic control systems for the digital transformation of production structures
- Specializing graduates from the Systems-, Industrial-, Computer-, Electric- and Electronic Engineering in developing Cyber-Physical Production Systems for the Industry of the Future, integrated in the Cloud Universal Manufacturing space by help of the new IC^{2}T,of the Key Enabling Technologies and applied Artificial Intelligence techniques.

Programming languages and technologies:

JAVA/JADE, C++, ILOG CPLEX OPL, MATLAB, V+, RAPID, Promia, Sick, Cognex In-Sight, UAV-WSN, Arduino IDE, Simatic Step 7, Ladder, Grafcet, OpenCV/OpenGL, Linux, CloudBurst, Big Data Apache Hadoop, SDN Industrial IoT, Lora WAN.

Requirements

Basic knowledge (BSc-level) concerning control systems, sensors, computer architectures and programming, databases, algorithms, communication and networks.

Skills acquired through this program

Students will gain knowledge and practical skills related to advanced control of industrial, mobile

ground and aerial robots integrated in digital manufacturing and service systems with distributed intelligence (multi-agent and edge computing systems, product-driven automation,digital twins, cloud, Industrial IoT and Cyber-Physical Production Systems). Graduates of thismaster program will get provable expertise in the design, development, implementing and deployment of actual types of automation and robotic applications. They will also learn about the current and emerging challenges in the field, the state-of-the-art solutions including key aspects of efficient layout and integration, performance optimization, reality-awareness, fault tolerance, scalability, fault tolerance, and security of automatic control and robot systems.

The knowledge transferred in this master program is grouped in three areas, covering the latest advances in the 'core' Information, Communication and Control Technologies (IC^2T) used in robotic and automatic control systems:

- *Sensors, actuation and mobility*: sensor fusion, haptics, data acquisition, machine vision systems, human-machine interfaces, mobile ground and aerial platforms, manipulatorarms, motors and servos, grippers and tools, robot programming
- *Thinking and cognition*: cognitive robotics, smart image processing and shape recognition advanced, multitasking robot control - hardware-software, motion planning and tracking, cloud robot services, machine learning, navigation and mapping, human-robot interaction
- *Integration and cooperation*: distributing intelligence/multi-agent systems, intelligent product/product-driven automation, edge and fog computing/communication middleware, Industrial IoT, resource virtualization/cloud manufacturing and robot services, big data analytics and predictive industrial control, Cyber-Physical Production Systems, embeddedsystems, digital twins for robots and smart manufacturing systems

Research subjects (selection):

Multitasking motion control of robot vision systems integrated with multiple external device axes. Hybrid position-effort control system for the constrained motion of an industrial robot. Multi-agent system for the coordinated control of swarm-type robot systems. Artificial vision system for human manipulative gesture emulation by highly dexterous robot tasks. Dual robot arm control in collaborative object handling tasks. Programming sequences of robot actionsby showing. Virtualizing shop floor devices for health monitoring and maintenance. Design and implementation of digital twins for robot and smart manufacturing control. Semi- heterarchical control of manufacturing. Digital models for Cloud Universal Manufacturing. Machine learning-based predictive production control with energy-awareness. Robot vision systems for industrial applications and services. Interaction of children with humanoid robots. Multi-agent systems for swarm robot control. Trajectory planning for multi-agent systems in amulti-obstacle environment. Parallel processing of images. UAV navigation control systems.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Evaluation form (E/V)	ECTS
			Lecture	Tutorial	Lab work	Project		

1	1	Robot Motion Planning and Control		2		2		E	5
1	1	Guidance Vision in Robotics		2		2		E	5
1	1	Mechatronics Engineering		2		2		V	5
1	1	Elective subject	Embedded Systems for Industrial Control	2		2		E	5
1	1		Machine Learning Methods and Applications	2		2		E	
1	1	Research activities					12	V	10
1	2	Mobile Robots and Collective Control		2		2		E	5
1	2	Multi-Agent Systems and Programming		2		2		E	5
1	2	Smart Robot Learning		2		2		V	5
1	2	Elective subject	Cloud Manufacturing Modelsand Services in Robotics	2		2		E	5
1	2		Intelligent Image Processing	2		2		E	
1	2	Research activities					12	V	10
2	3	Natural Human-Robot Interaction		2		2		E	5
2	3	Unmanned Aerial Vehicles		2		2		E	5
2	3	Industrial IoT and Big Data Integration		2			2	E	5
2	3	Elective subject	Robots in Industrial Applications	2			2	V	5
2	3		Intelligent ManufacturingSystems	2			2	V	
2	3	Research activities					12	V	10
2	3	Artificial Ethics and Legal Issues in Robotics		1				V	2
2	3	Research activities and preparation of		27				V	28

OTHER INFORMATION

WEBSITE:	http://acs.pub.ro/en/academics/master-of-science-studies/
CONTACT PERSON:	Theodor Borangiu Florin Anton

Cyber Physical Systems (taught in English)

FACULTY: Automatic Control and Computer Science

DESCRIPTION AND MAIN OBJECTIVES

The master's program aims to train specialists who have the integrative vision of the systems computing, communications and management for heterogeneous, complex and large physical processes, a whose operation must correspond to a set of required performances.

Relevance to the labor market

The concept of Cyber-Physical System (CPS) is the newest paradigm based on currentarchitectures and management methodologies for heterogeneous complex systems, which include autonomous subsystems, which represent both physical processes and sensor prescriptions, communications with various types of delays or software services - from various vendors - and whose Global behavior is generated by the interaction of components. Examples of such systems are networks transport, energy systems, enterprise networks, intelligent manufacturing systems, structures smart-city type, but also personalized assistance systems, supply chain management networks, etc. specialists involved in the design, implementation and operation of such systems must possess both knowledge of systems theory, as well as sensor networks, computer networks, communications, as well as a formation to allows rapid understanding and proper modeling, testing, evaluation of various types of physical processes.

Required knowledge

The ideal CPS master's student profile includes skills in systems engineering and in the fieldof information and / or communication technologies.

Acquired skills and abilities

Ability to identify, formulate and solve engineering problems that integrate physical aspects, of management, communication and IT

Competence to identify, design and apply mathematical process models involving subsystems physical, cyber and networked communication

Ability to select and use appropriate problem-solving techniques, skills and tools complex engineering and to evaluate the issues related to the operational safety and reliability of the solution

Effective communication skills in transdisciplinary teams materials Fundamentals of CPS; Software Programming Engineering; Sensors and actuator networks; IoT and Advanced

Communication Systems; Modeling, planning and scheduling in complex heterogeneous systems; Hybrid Systems; Big Data in CPS; Multi-Agent Systems; Advanced control systems; Distributed and networked systems; Deep Learning; CPS modeling and design formalisms and languages. Case studies, in the following domains, will be analyzed: Energy - smart grids, Transportation (multimodal transport), Manufacturing (smart factory); Health; Research activities, M.Sc. thesis preparation. Ethics.

Programming languages and technologies used

Modeling languages: BPMN, EPC, SysML; Programming languages: SQL, C #, C ++, Java; Technologies: Service Oriented Architecture, REST Research topics (examples) Complex integrated systems (CPS) in manufacturing; Smart City CPS service platform; Smart-house assistance system; Intelligent farm modeled as a Cyber Physical System; security cybernetics in intelligent transport networks; Development of applications based on Wireless Sensor Networks, Internet of Things

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Fundamentals of CPS	2			2	5
1	1	Software Programming Engineering	2			2	5
1	1	Wireless Sensor Networks in CPS	2			2	5
1	1	Modeling, planning and scheduling in complex heterogeneous systems	2	1		1	5
1	1	Scientific research and practice					10

1	2	IoT and Advanced Communication Systems	2		1	1	5
1	2	Hybrid Systems	2	1		1	5
1	2	Big Data in CPS	2			2	5
1	2	Multi-Agent Systems	2		1	1	5
1	2	Scientific research and practice					10
2	3	Advanced Control Systems	2	1		1	5
2	3	Distributed and networked systems	2			2	5
2	3	Deep Learning	2	1		1	5
2	3	CPS modeling and design formalisms and languages	2	1		1	5
2	3	Scientific research and practice					10
2	4	Scientific research, practice and development of master's thesis					28

OTHER INFORMATION

Partner companies: ORACLE, General Electric, Yokogawa, INCAS

WEBSITE:

CONTACT PERSON: Prof.Dr.Ing Ioan Dumitrache

DOMAIN: ENGINEERING AND MANAGEMENT

Bachelor programs

Business Engineering and Management (taught in English)

FACULTY: Entrepreneurship, Business Engineering and Management

DESCRIPTION AND MAIN OBJECTIVES

The Business Engineering and Management Bachelor's Degree Program offers an undergraduate specialization which is highly appreciated by employers on the international labour market. As a distinguishing element, the program offers a wide range of entrepreneurial, technical and management competences necessary for a successful management or entrepreneurship career. Also, students can access study mobilities programs, and they will receive the benefits of a multicultural learning environment, due to the interactions with international students enrolled in this program.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Mathematical Analysis	2	2	0	0		5
1	1	Physics 1	2	0	2	0		5
1	1	Chemistry	2	0	2	0		5
1	1	Computer Programming 1	2	0	2	1		5
1	1	Fundamentals of Economics 1	2	1	0	0		4
1	1	English for Engineering 1	1	1	0	0		3
1	1	Physical Education and Sport 1	0	2	0	0		3
1	2	Linear Algebra, Analytic and Differential Geometry	2	2	0	0		4
1	2	Physics 2	2	0	2	0		4
1	2	Fundamentals of Economics 2	2	1	0	0		4
1	2	Computer Programming 2	2	0	2	0		4
1	2	Biotechnology	2	1	0	0		4
1	2	English for Engineering 2	1	1	0	0		3
1	2	Introduction to Materials Science and Engineering	2	0	1	0		4
1	2	Physical Education and Sport 2	0	2	0	0		1

Optional subjects								
1	1	Entrepreneurial Culture	1	1	0	0		2
1	1	Corporate Social Responsibility	1	1	0	0		2
1	2	Sociology	2	1	0	0		2
1	2	Psychology	2	1	0	0		2
Facultative subjects								
1	1	The Psychology of Education	2	2	0	0		5
1	1	German Language 1	1	1	0	0		3
1	2	Pedagogy 1	2	2	0	0		5
1	2	German Language 2	1	1	0	0		3
Second Year Compulsory subjects								
2	1	Statistics and Stochastics	2	2	0	0		5
2	1	Mechanics and Strength of Materials	2	0	2	0		4
2	1	Production, Transmission and Distribution of Energy	2	0	2	0		4
2	1	Fundamentals of Electrical Engineering	2	2	0	0		5
2	1	Fundamentals of Management	2	1	0	0		5
2	1	English for Engineering 3	0	2	0	0		2
2	1	Physical Education and Sport 3	0	2	0	0		1
2	2	Advanced Mathematics for Decision Making	2	2	0	0		5
2	2	Mechanical Technologies and Equipment	2	0	2	0		5
2	2	Marketing	2	2	0	0		4
2	2	Electronic Measurements and Technical Systems	2	0	2	0		5
2	2	Applied Informatics	2	0	1	0		4
2	2	English for Engineering 4	0	2	0	0		2
2	2	Physical Education and Sport 4	0	1	0	0		1
Optional subjects								
2	1	Processing of Business Data	2	2	0	0		5
2	1	Algorithms and Data Structures	2	1	2	0		3
2	2	Statistical Techniques in Business Processes	2	2	0	0		4
2	2	Economic Statistics	2	2	0	0		4
Facultative subjects								
2	1	Pedagogy 2	0	2	0	0		2

2	1	German Language 3	0	0	2	0		2
2	2	Didactics of the specialization	2	2	0	0		5
2	2	German Language 4	0	2	0	0		4
Third Year Compulsory subjects								
3	1	Human Resources Management	2	2	0	0		5
3	1	Operations and Supply Chain Management	3	2	0	1		5
3	1	Quality Engineering	2	2	0	0		5
3	1	Computer Aided Design and Technical Drawing	2	0	2	0		5
3	1	Risk Assessment Techniques in Industrial Organizations	2	2	0	0		4
3	2	Management of Technology and Innovation	2	2	0	0		4
3	2	Financial Management	2	2	0	0		4
3	2	Business Research Methods	2	2	0	0		3
3	2	Organizational Behaviour	2	1	0	0		2
3	2	Industrial Logistics	2	2	0	0		4
3	2	Business Law	2	1	0	0		2
3	2	Practical Stage (12 weeks)	0	0	0	2	360	8
Optional Subjects								
3	1	Management Accounting	2	2	0	0		3
3	1	Financial Accounting	2	2	0	0		3
3	2	Cost-Benefit Analysis for Business	2	2	0	0		3
3	2	Business Forecasting	2	2	0	0		3
Facultative subjects								
3	1	Computer aided training	1	1	0	0		2
3	1	Pedagogical practice in compulsory pre-university education (1)	0	3	0	0		3
3	1	Business English	0	2	0	0		4
3	1	German Language 5	0	2	0	0		4
3	2	Pedagogical practice in compulsory pre-university education (2) (12 weeks)	0	3	0	0		2
3	2	Student class management	1	1	0	0		3
3	2	Graduation Exam - Level 1	0	0	0	0		5
3	2	Business English	0	2	0	0		4
3	2	German Language 6	0	2	0	0		4
Fourth Year Compulsory subjects								

4	1	Project Management	2	0	2	1		5
4	1	Business Process Modelling and Simulation	2	0	2	0		4
4	1	Business Integrated Information Systems	2	0	2	0		5
4	1	Entrepreneurship	2	2	0	0		5
4	1	Intellectual Property	2	1	0	0		3
4	1	Organizational Design and Change Management	2	1	0	0		4
4	2	International Law	2	1	0	0		4
4	2	Factory Planning and Ergonomics	2	2	0	2		5
4	2	Electronic Businesses	2	2	0	0		4
4	2	Business Start-up with Innovative Products	2	2	0	1		5
4	2	Management Communication	2	2	0	0		4
4	2	Development of Graduate Project	0	0	0	4		4
4	2	Practical stage for development of Graduate Project (60 hours)	0	0	0	0	60	4
Optional Subjects								
4	1	Sustainable Development	2	1	0	0		4
4	1	Eco-technology	2	1	0	0		4
Facultative Subjects								
4	1	Business English	0	2	0	0		4
4	1	German Language 7	0	2	0	0		4
4	2	Business English	0	2	0	0		4
4	2	German Language 8	0	2	0	0		4

		Diploma Exam	0	2	0	0		10

OTHER INFORMATION

All subjects of the program are open for Erasmus incoming students.

WEBSITE:	http://faima.pub.ro/programe.php?hl=ro
CONTACT PERSON:	Mrs. Dana Corina DESELNICU

Mechanical Engineering and Management / Wirtschaftsingenieurwessen- technische Fachrichtung Maschinenbau (taught in German)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The Faculty of Engineering in Foreign Languages (FILS) developed the bachelor program "Mechanical Engineering and Management" together with renown Professors from the Technical University of Darmstadt, Technical University of Braunschweig, and the University of Applied Sciences of München, and offers an interdisciplinary experience: business, engineering and law sciences for students which already master German as well as for those who graduate a preparatory year with intensive teaching of German with accent on technical language and communication.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
		First Year Compulsory subjects						
1	1	Mathematik 1a	2	2	-	-		3
1	1	Mathematik 1b	2	1				3
1	1	Grundlagen der Wirtschaftslehre	1	1	-	-		2
1	1	Allgemeine Wirtschaftslehre 1	1	1	-	-		3
1	1	Betriebswirtschaftslehre 1	2	1	1	-		3
1	1	Technische Mechanik 1	3	2	-	-		5
1	1	Physik	2	-	1	-		3
1	1	Buchführung	2	-	-	-		3
1	1	Technologie der Fertigungsverfahren	2	-	1	-		4
1	1	Angewandte Informatik 1	2					2
1	2	Mathematik 2	4	2				6
1	2	Betriebswirtschaftslehre 2	1	1				2
1	2	Technische Mechanik 2	2		2			4
1	2	Wirtschaftsinformatik	1	1				3
1	2	Angewandte Informatik 2	-	-	2			2
1	2	Elektrotechnik u. elektrische Maschinen	2	-	1			3
1	2	Werkstoffkunde und –prüfung	2	-	1			3
1	2	Vertragsrecht	2	-	-			3
1	2	Deutsch Interkulturell 1		2				2
		Elective subjects						
1	1	Fachkommunikation 1	2					2
1	1	Expression et communication 1	2					2
1	2	Fachkommunikation 2		2				2
1	2	Expression et communication 2		2				2

		Facultative subjects						
1	1	Psihologia educației (Ro)	2	-	-	-		2
1	1	Landeskunde 1		2				2
		Second Year Compulsory subjects						
2	1	Mathematik 3 für MB	2	2				4
2	1	Technische Thermodynamik 1	2	1				4
2	1	Mechanismen u. Maschinenelemente 1	2		2			5
2	1	Projekt Mechanismen und Maschinenelemente 1				2		2
2	1	Technisches Zeichnen und Infografik I	2			2		4
2	1	E-Commerce	1	2				3
2	1	Wahrscheinlichkeitstheorie und mathematische Statistik 1	2	2				3
2	1	Sport 1		2				3
2	2	Technische Thermodynamik 2	2	2				5
2	2	Mechanismen u. Maschinenelemente 2	4		2			6
2	2	Projekt Mechanismen u Maschinenelemente 2				2		3
2	2	Numerische Berechnungsverfahren	1	2				4
2	2	Investition und Finanzierung	2					2
2	2	Marketing	2					2
2	2	Operations Research	2	2				3
2	2	Wahrscheinlichkeitstheorie und mathematische Statistik 2	2	2				3
		Elective subjects						
2	1	Unternehmenskommunikation 1	2					2
2	1	Wirtschaftsenglisch 1	2					2
2	2	Unternehmenskommunikation 2		2				2
2	2	Wirtschaftsenglisch 2		2				2
		Facultative subjects						
2	1	Landeskunde 2		2				2
2	2	Landeskunde 3		2				2
		Third Year Compulsory subjects						
3	1	Mechanische Schwingungen	3	2				6
3	1	Regelungstechnik	3	1				4

3	1	Technische Strömungslehre	2	1	1			4
3	1	Unternehmensführung	2					2
3	1	Wirtschafts- und Finanzpolitik	2					2
3	1	Produktion und Supply Chain Management	2					3
3	1	Empirische Wirtschaftsforschung	2					2
3	1	Seminar VWL/BWL		2				3
3	1	Moderieren und Präsentieren		2				2
3	2	Kosten- und Leistungsrechnung	2	1				2
3	2	Produkt Design Projekt	1			2		2
3	2	Modellierung und Simulation im MB	1		2			2
3	2	Wärme- und Stoffübertragung	2		2			3
3	2	Werkzeugmaschinen und Industrieroboter	2		2			3
3	2	Einführung in das wissenschaftliche Arbeiten		2				2
3	2	Technisches Praktikum (240 h)					20	4
3	2	Technisches Praktikum (120 h)					10	4
3	2	Einführung in die Makroökonomie	2	1				2
3	2	Bilanzierung	2					2
		Elective Subjects						
3	1	Unternehmensrecht	2					2
3	1	Arbeitsrecht	2					2
3	2	Produktdatentechnologie	2	2				4
3	2	Procédés de fabrication	2	2				4
		Facultative subjects						
3	1	Pedagogie 1 (lb. română)	2	2				4
3	1	Logistik	2					2
3	2	Bionik	2					2
3	2	Pedagogie 2 (lb. română)	2					2
		Fourth Year Compulsory subjects						
4	1	Verbrennungskraftmaschinen	2		2			5
4	1	Virtual Prototype 1	2		2			4
4	1	Modellierung und Systemanalyse	1		2			4

4	1	Projektmanagement	2	1				4
4	1	Öffentlichkeitsarbeit		2				2
4	1	Projektmanagement	2	2				4
4	1	Wirtschaftstheorie 1	2	1				3
4	1	Ökonometrie	2	1				2
4	2	Geschäftskompetenzen				2		2
4	2	Qualitätssicherung / F&E	2					2
4	2	Technische Dokumentation	2					2
4	2	Wirtschaftstheorie 2	2			1		3
4	2	Controlling	2					2
4	2	Arbeitsrecht	2					2
4	2	Erarbeitung Bachelor Thesis					8	5
4	2	Praktikum Bachelor Thesis						5
		Elective Subjects						
4	1	Maschinendynamik	2		2			4
4	1	Angewandte Informatik (fr.)	2		2			4
4	1	Betriebliche Organisation	2					2
4	1	General Management	2					2
4	2	Produkt Design Projekt 1				3		3
4	2	Webdesign				3		3
4	2	Messtechnik für MB	2			2		4
4	2	Tribologie	2			2		4
		Facultative subjects						
4	1	Unterrichtspraktikum (in rumänischer Sprache)				2		2
4	1	Methodik des Faches (in rumänischer Sprache)	2					2
4	2	Business Plan		2				2
4	2	Europäische Studien	2					2

OTHER INFORMATION

All subject of the program are open for Erasmus incoming students for one or two semesters.

The bachelor program is carried out in cooperation with companies as Stein & Partner Management Consulting, Hewlett-Packard Enterprise und APT Resources and Services.

The Bachelor Thesis can be carried out in cooperation with companies or foreign universities.

WEBSITE: http://ing.pub.ro/de/education/licence/

CONTACT PERSON: Mrs. Laura TRIFAN

Electrical Engineering and Management (taught in German)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The Faculty of Engineering in Foreign Languages (FILS) established and developed the bachelor program "Electric Engineering and Management" together with renown Professors of Technical University of Darmstadt, Technical University of Braunschweig, the University of Applied Sciences of München and it offers an interdisciplinary combination of disciplines of business, engineering and law for students who already master German, as well as for those who graduate from a preparatory year with intensive teaching of German with stress on technical language and communication.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Mathematik 1	4	2	-	-		6
1	1	Physik	2	1				3
1	1	Informatik 1	2					2
1	1	Grundlagen der Wirtschaftslehre 1	1	1		-		2
1	1	Betriebswirtschaftslehre I	1	1				3
1	1	Grundlagen der Elektrotechnik 1	3	2		-		6
1	1	Buchführung	2	1		-		3
1	1	Datenbanken		2				3
1	2	Mathematik 2	4	2				6
1	2	Informatik 2			2			2
1	2	Betriebswirtschaftslehre II	1	1				2
1	2	Halbleiterbauelemente	2		2			4
1	2	Grundlagen der Elektrotechnik 2	3	2				6
1	2	Wirtschaftsinformatik	1	1				3
1	2	Vertragsrecht	2					3

		Elective subjects						
1	1	Fachkommunikation 1		2				2
1	1	Expression et communication 1		2				2
1	2	Deutsch Interkulturell 1		2				2
1	2	Fachkommunikation 2		2				2
1	2	Expression et communication 2		2				2
		Facultative subjects						
1	1	Erziehungspsychologie (in rumänischer Sprache)	2	-	-	-		2
		Second Year Compulsory subjects						
2	1	Mathematik 3 für ETiT	4	2				6
2	1	Grundlagen der Elektrotechnik 3	3	2				6
2	1	Elektrische Messtechnik	2		1			4
2	1	Objektorientierte Softwareentwicklung	2		2			4
2	1	Kosten- und Leistungsrechnung	2	1				3
2	1	Statistik I	2	1				3
2	1	Unternehmensrecht	2					2
2	2	Sensoren und Aktuatoren	2		1			3
2	2	Technische Mechanik	2	2				4
2	2	Digitalsignalverarbeitung	3		1			5
2	2	e-Commerce	1		2			4
2	2	Grundlagen der Energietechnik	2	1				2
2	2	Marketing	2					2
2	2	Operations Research	2	1				3
2	2	Unternehmensführung	2					2
2	2	Statistik II	2	1				3
		Elective subjects						
2	1	Unternehmenskommunikation 1	2					2
2	1	Wirtschaftsenglisch 1	2					2
2	2	Unternehmenskommunikation 2		2				2
2	2	Langue francaise pour ingenieurs		2				2
		Facultative subjects						
2	1	Landeskunde		2				2
2	1	Fredsprache		2				2

2	1	Sport		2				2
		Third Year Compulsory subjects						
3	1	Regelungstechnik 1	3	1				4
3	1	Logischer Entwurf	3	1				5
3	1	Investition und Finanzierung	2					2
3	1	Wirtschafts- und Finanzpolitik	2					2
3	1	Produktion und Supply Chain Management	2					2
3	1	Marketingforschung	2					3
3	1	Moderieren und Präsentieren		2				2
3	2	Numerische Berechnungsverfahren	1	2				4
3	2	Analoge Schaltungen	2	2				3
3	2	Softwaresysteme	2	1				2
3	2	Einführung in das wissenschaftliche Arbeiten		2				2
3	2	Bilanzierung	2					2
3	2	Einführung in die Makroökonomie	1	1				2
3	2	Werkstoffe der Elektrotechnik	2		2			3
3	2	Praktikum					30	6
		Elective subjects						
3	1	Leistungselektronik	3					4
3	1	Grundlagen der Nachrichtentechnik	3	1				4
3	1	Sport		2				2
3	2	Rechnersysteme 1	3	1				3
3	2	Elektrische Maschinen und Antriebe	2		2			3
		Facultative subjects						
3	1	Pädagogik 1 (in rumänischer Sprache)	2	2				4
3	1	Logistik	2					2
3	1	Wirtschaftsenglisch		2				2
3	2	Grundlagen der Wirtschaftslehre 2	2					2
3	2	Bionik	2					2
3	2	Pädagogik 2 (in rumänischer Sprache)	2					2
		Fourth Year Compulsory subjects						
4	1	Übertragungstechnik	2		2			5

4	1	Modellierung und Systemanalyse	1		2			4
4	1	Seminar BWL/VWL		3				3
4	1	Öffentlichkeitsarbeit		2				2
4	1	Hochfrequenztechnik	2	1	1			5
4	1	Projektmanagement	2	1				4
4	1	Wirtschaftstheorie I	2	1				3
4	1	Ökonometrie	2					2
4	1	Betriebliche Organisation	2					2
4	2	Geschäftskompetenzen				2		2
4	2	Qualitätsmanagement	2					2
4	2	Elektrische Energieversorgung	2	1				3
4	2	Controlling	2					2
4	2	Hochspannungstechnik	2	1				4
4	2	Wirtschaftstheorie II	2			2		3
4	2	Technische Dokumentation	2					2
4	2	Arbeitsrecht	2					2
4	2	Bachelorthesispraktikum					8	10
		Facultative subjects						
4	1	Unterrichtspraktikum (in rumänischer Sprache)			2			2
4	1	Methodik des Faches (in rumänischer Sprache)	2					2
4	2	Business Plan		2				2
4	2	EBCL		3				3
4	2	General Management II		4				4
4	2	Europäische Studien	2					2

OTHER INFORMATION

All the courses of the program are open for Erasmus incoming students and the program has incoming and outgoing Erasmus students for one or two semesters each year.

The bachelor program is carried out in cooperation with reputed companies: Stein & Partner Management Consulting, Bosch Romania, Selgros Cash and Carry Romania, Honeywell Garret Romania, IBM Romania, Microsoft Romania, Hewlett-Packard Enterprise und APT Resources and Services.

The Bachelor Thesis can be carried out in cooperation with enterprises or foreign universities.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mr. Cristian MUSTAȚĂ

Business Engineering and Management (taught in German)

FACULTY: Entrepreneurship, Business Engineering and Management

DESCRIPTION AND MAIN OBJECTIVES

The Business Engineering and Management Bachelor's Degree Program aims at ensuring the perfect balance between modern engineering and technology subjects on one hand and management, business and entrepreneurial subjects on the other hand. It offers a multidisciplinary approach to an undergraduate specialization which is highly appreciated by employers on the European and international labour market. As a distinguishing element, apart from learning in the German language, which is extremely valuable to all companies with a German background, the program offers a wide range of entrepreneurial, technical and management competences necessary for a successful management career in any technology-driven industry. Also, students can access study mobilities programs, and they will receive the benefits of a multicultural learning environment, due to the interactions with international students and German teaching staff enrolled in this program.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Mathematische Analyse	2	1	0	0		4
1	1	Physik I	2	0	1	0		4
1	1	Angewandte Informatik I	2	0	2	0		4
1	1	Grundlagen der Wirtschaftslehre I	2	2	0	0		4
1	1	Personalmanagement	2	0	0	0		3
1	1	Computerprogrammierung und Programmiersprachen I	2	0	2	0		4
1	1	Fremdsprachen Deutsch I	1	1	0	0		2
1	1	Sport I	0	2	0	0		3
1	2	Algebra, analytische und differentielle Geometrie	2	1	0	0		4
1	2	Physik II	2	0	1	0		
1	2	Angewandte Informatik II	2	0	2	0		
1	2	Grundlagen der Wirtschaftslehre II	2	1	0	0		4

1	2	Betriebswirtschaftslehre I	2	1	0	0		4
1	2	Computerprogrammierung und Programmiersprachen II	2	0	2	0		4
1	2	Fremdsprachen Deutsch II	1	1	0	0		3
1	2	Sport II	0	2	0	0		4
Optional subjects								
1	1	Fremdsprachen Englisch I	0	2	0	0		2
1	1	Fremdsprachen Französisch I	0	2	0	0		2
1	2	Fremdsprachen Englisch II	0	2	0	0		2
1	2	Fremdsprachen Französisch II	0	2	0	0		2
Facultative subjects								
1	1	Bildungspsychologie	2	2	0	0		5
1	2	Pädagogik I	2	2	0	0		5
Second Year Compulsory subjects								
2	1	Computergraphik	2	0	2	0		4
2	1	Recht	3	2	0	0		5
2	1	Führungskommunikation I	2	0	0	0		3
2	1	Verhandlung und Geschäftsethik	2	1	0	0		3
2	1	Elektrische und elektronische Technologien, Ausrüstungen und Anlagen I	2	0	2	1		5
2	1	Betriebswirtschaftslehre II	2	2	0	0		5
2	1	Sport III	0	1	0	0		3
2	2	Buchhaltung	2	2	0	0		4
2	2	Internationales Privatrecht	2	0	0	0		3
2	2	Betriebliche Datenverarbeitung	2	0	2	0		3
2	2	Elektrische und elektronische Technologien, Ausrüstungen und Anlagen II	3	0	2	1		6
2	2	Führungskommunikation II	2	2	0	0		4
2	2	Fachkommunikation II	2	0	0	0		2
2	2	Sport IV	0	1	0	0		3
Optional subjects								
2	1	Fachkommunikation I	1	1	0	0		3
2	1	Berufskommunikation I	1	1	0	0		3
2	2	Technologiemanagement	2	0	1	0		3
2	2	Statistik in Produktionsprozessen	2	0	1	0		3

Facultative subjects								
2	1	Pädagogik II	0	2	0	0		2
2	2	Lehrdidaktik	0	0	2	0		2
2	2	Fremdsprache III	2	2	0	0		5
Third Year Compulsory subjects								
3	1	Energieerzeugung, - transport und - nutzung	2	1	1	0		5
3	1	Produktionswirtschaft	2	2	0	0		5
3	1	Mechanik und Festigkeitslehre	3	2	0	0		6
3	1	Marketing	2	2	0	1		3+2
3	1	Projektmanagement	2	0	1	1		5
3	2	Operations Research	1	1	0	0		3
3	2	Qualitätsmanagement	2	1	0	1		3
3	2	Nachhaltige Entwicklung	2	2	0	1		5
3	2	Innovationsmanagement	2	1	0	1		4
3	2	Marketingforschung	2	0	1	1		4
3	2	Kosten- und Leistungsrechnung	2	1	0	0		3
3	2	Praktikum	360 ore (12 sapt x 5 zile x 6 ore)				360	4
Optional Subjects								
3	1	Finanzierung und Kreditvergabe	2	2	0	0		4
3	1	Geld, Banken und Kapitalmärkte	2	2	0	0		4
3	2	Finanzielles Management	2	2	0	0		4
3	2	Europäische Wirtschaftspolitik	2	2	0	0		4
Facultative subjects								
3	1	Computergestützte Schulung	1	1	0	0		2
3	1	Pädagogisches Praktikum I	0	3	0	0		3
3	2	Pädagogisches Praktikum II	0	3	0	0		2
3	2	Schülerklassenmanagement	1	1	0	0		3
3	2	Abschlussprüfung - Stufe I	0	0	0	0		5
Fourth Year Compulsory subjects								
4	1	Geschäftsentwicklung im Dienstleistungsbereich	2	2	0	1		5
4	1	Umwelttechnik und -management	2	0	1	1		5
4	1	Simulation der Produktionsprozesse	2	0	2	0		5
4	1	Computergestütztes Produktdesign	2	0	1	1		5
4	1	Geschäfte mit innovativen Produkten	2	1	0	0		4

4	2	Durchführbarkeit und Effizienz der Investitionen	2	2	0	2		6
4	2	Logistik	2	2	0	2		6
4	2	E-Commerce	2	0	2	1		3+2
4	2	Technologisches Unternehmertum	2	2	0	1		5
4	2	Praktikum für die Erstellung der Diplomarbeit	60 ore					4
4	2	Erstellung der Diplomarbeit	0	0	0	4		4
Optional Subjects								
4	1	Risikobewertungsverfahren in Industrieorganisationen	2	2	0	2		6
4	1	Geschäftsbewertung	2	2	0	2		6

		Examen Dplomă	0	0	0	0		10

OTHER INFORMATION

All subjects of the program are open for Erasmus incoming students.

The bachelor program is organized in cooperation with the local branches of some of the most important global companies, from a wide range of industries, such as:

- Automotive: Mercedes, BMW, Porsche, Volkswagen, Audi, Skoda etc.
- Finance: Erste Bank, Raiffeisen Bank, Deutsche Bank etc.
- Retail: Lidl, Kaufland, Penny, Profi, Metro, Selgros, Hornbach, OBI etc.
- Infrastructure: Porr, Strabag, Schindler, Otis, Deutsche Bahn, DB Schenker, DHL etc.
- Medical: Bayer, Merck, BASF, Roche, Hoechst etc.
- Engineering: Bosch, Siemens, Vaillant, Salesianer etc.

Throughout the duration of the program, students will also benefit from a number of different interactions, such as seminars and workshops with German teaching staff and internships, company visits and workshops with the help of senior company representatives from the above-mentioned companies.

WEBSITE:	http://faima.upb.ro/licenta.php
CONTACT PERSON:	Andrei NICULESCU

Master programs

Business Administration and Engineering (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The program runs for 24 years and produced graduates working in key positions in renowned

companies, some started up as their own entrepreneurial initiatives. The program addressesthe graduates from technical universities, general universities or academies of economicsfrom Romania and abroad, wishing to obtain economic knowledge and to achieve digital proficiency fos successful businesses. The students receive a combination of technical and economical knowledge, granting analytical abilities and problem solving skills in business administration and management.

CURRICULA

Year	Sem	Subject name	Weekly number of hours					ECTS
			Lecture	Tutorial	Labwork	Project	Research	
Compulsory subjects								
1	1	Industrial Marketing	2		1			4
1	1	Financial Management	2		1	1		4
1	1	Management of Information Systems	2		1			4
1	1	Event Driven Dynamic Systems	2		1			4
1	1	International Trade and Transactions	2		1			4
1	1	Scientific and Practical Research 1					12	10
Facultative subjects								
1	1	Design management of educational	2	1				5
		programs						
			Lecture	Tutorial	Labwork	Project	Research	
Compulsory subjects								
1	2	Strategic Management	2		2			5
1	2	Numerical Methods for Economic Systems	2		1	1		5
1	2	Data and Signal Processing for Business	2		2			5
1	2	Business Cultural Models and Diversity Management	2		2			5
1	2	Scientific and Practical Research 2					12	10
Facultative subjects								
1	2	Psycho pedagogy of Adolescents, Young People and Adults	2	1				5
1	2	Multimedia Advice, Guidance and Counselling (Optional 1)	1	2				5
Compulsory subjects								
2	3	Technology Entrepreneurship	2		2			5
2	3	Project Management	2		1	1		5

2	3	Prediction of System Evolution	2		1	1		5
2	3	Modeling of Complex Systems	2		1	1		5
2	3	Scientific and Practical Research 3					12	10
Facultative subjects								
2	3	Didactics of the field and developments in the didactics of specialization (high school, post-secondary school education)	2	1				5
2	3	Sociology of Education / Intercultural Education (Optional 2)	1	2				5
Compulsory subjects								
2	4	Research, practice research and dissertation preparation					27	28
2	4	Ethics	1					2
Facultative subjects								
2	4	Pedagogical practice (high school, post-secondary school education)					3	5
2	4	Graduation Exam, Level II						5

OTHER INFORMATION

This program yearly receives incoming Erasmus students for one semester or one entire year.

WEBSITE:	http://ing.pub.ro/en/education/master/mbae/
CONTACT PERSON:	assoc.prof. Bujor PAVALOIU

Master's programme title: Management of the digital entreprise (taught in English)

FACULTY: Entrepreneurship, Business Engineering and Management

DESCRIPTION AND MAIN OBJECTIVES

Master of the Digital Enterprises (***MDE***) was initiated by the Department of Entrepreneurship and Management, the Faculty of Entrepreneurship, Business Engineering and Management from the University Politehnica of Bucharest. The program is run in collaboration with the Faculty of Automatic Control and Computer Science. The program is completed in four semesters over two years and will be highly practice oriented. As aminimum requirement for admissions to the program, applicants must have a bachelor's degree and good English language skills.

Digital technology contributes decisively to remodelling the whole industry and value chains, offering a wide range of products and services, facilitating capitalizing opportunities and also optimizing the organization's response to change or reducing the barriers to entry in different industrial sectors. A digital enterprise is characterized by extensive connectivity and by the integration of processes and existing capabilities. Increasing connectivity in the business sector by using more and more equipment that automatizes business processes, providing services or processing data, determined, in many cases, enterprises to invest in smart technologies. All functions of an enterprise, regardless of industry operating in, have also a technical dimension which must be integrated within the operations and processes involved. For example, creating virtual agile enterprises that ensures continuous improvement of operations in a digital environment. Businesses digitization can significantly

contribute in the future to creating jobs and generating business opportunities.

From this perspective there is a real demand on the labour market for specialists capable to understand and efficiently use these technologies, both technically, but also for business management. The program aims to prepare specialists able to understand and analyse strategies and business processes in an enterprise. Therefore, the program of master studies "Management of the Digital Enterprise" meet these requirements by preparing specialists able to recognize the opportunity to use digital technologies in enterprises but also how the way these technologies can contribute to business sustainable development.

This study program facilitates the development of business skills for students with a technical background or for those with management background that want to develop skills in using digital technology. Therefore, the program aimed at deepening the training in the field ofstudy - *Engineering and Management*.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Production Systems & Group Technology	2		2		4
1	1	Batch Planning and Resources Allocation	2		1		4
1	1	Organizational Management	2		1		4
1	1	Managing Human Capital	2		1		3
1	1	Business Intelligence and Risk Management	2		1		2
1	1	Scientific Research Work S1	12				13
1	2	Integrated Supply Chains and Logistics	2		1		3
1	2	Enterprise Warehousing and Information Systems	2		1		4
1	2	Financial Management	2		1		3
1	2	Business Process Modelling	1			1	3
1	2	Project Management	1			1	2
1	2	Power Management for Sustainability	2		1		3
1	2	Scientific Research Work S2	12				12
2	3	Digital Marketing	2		1		3
2	3	Entrepreneurship	2			1	3
2	3	Service Management	2		1		3
2	3	Business Communication	2		1		3
2	3	Business Process Management	1		1		3
2	3	Customer Relationship Management	1		1		2
2	3	Scientific Research Work S3	12				13
2	4	Practical work, scientific Research (Master Thesis preparation)	28				30

OTHER INFORMATION

The program is run in collaboration with the Faculty of Automatic Control and Computer Science.

WEBSITE:	http://faima.pub.ro/other_docs/Plan_Invatamant_Master_MDE_2014-2015.pdf
CONTACT PERSON:	Prof. dr. ing. Gheorghe Militaru

Business Engineering and Entrepreneurship (taught in English)

FACULTY: Entrepreneurship, Business Engineering and Management

DESCRIPTION AND MAIN OBJECTIVES

The Master program "***Business Engineering and Entrepreneurship"*** (***BEE***) is organized and coordinated by the Department of Entrepreneurship and Management, the Faculty of Entrepreneurship, Business Engineering and Management. Entrepreneurship education is critical for engineers in the knowledge-based economy. Teaching and research on new venture creation are the most common drivers of technological entrepreneurship initiatives. Successful technology ventures are able to meet customers' needs, leverage technology for advantage, and have a viable business model.

The mission of the BEE program is to enable every student to have the opportunity to integrate entrepreneurial and business studies into their formal education. The main objective is to provide skills and abilities necessary for students to identify and evaluate business opportunities, creating ventures focused on solving challenges in society and manage their own business. Entrepreneurs must be able to identify customer needs and market niches using lateral thinking skills and these skills should be taught to engineering students. Basically, this program could increase the entrepreneurial intention and activity of the students.

The program is completed in four semesters over two years and will be highly practice oriented. Program requires students to obtain a bachelor's degree before applying and good English language skills. Therefore, this program addresses the graduates from technical universities, but not only, wishing to develop skills necessary to identify, evaluate, and begin new business ventures. Students with a non-business bachelor degree can acquire knowledge and skills in entrepreneurship by participating in our master program (BEE). This is an excellent way to broaden career possibilities for them and building a successful career in international business environment. Designed to train future specialists this program will provide a strong foundation in technology entrepreneurship, marketing, project management, financial management, business strategy, and economics for entrepreneurs. Our teachers use real-world case studies and the latest academic research to identify and investigate issues that could develop key business skills. Therefore, the program aimed at deepening the training in the field of study - *Engineering and Management*.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Essentials of Business Management	2	1			5

1	1	Economics for Entrepreneurs	1	2			4
1	1	Human Capital Management in SMEs	2	1			4
1	1	Marketing	2	2			4
1	1	Communication & Negotiation Techniques	1	2			3
1	1	Scientific Research Work S1	12				10
1	2	Technology Entrepreneurship	2	1		1	5
1	2	Financial Management	2	1			5
1	2	Change Management	1	2			3
1	2	Operations Management	2	1			4
1	2	Services Management	2	1			3
1	2	Scientific Research Work S2	12				10
2	3	Project Management for Entrepreneurs	2	1			5
2	3	Business Strategy & Business Plan Model Development	2	1			5
2	3	Information Systems for Managers	1	2			4
2	3	Organizational Behaviour & Leadership	1	1			3
2	3	Business Risks Analysis & Management	2	1			3
2	3	Scientific Research Work S3	12				10
2	4	Practical internship, scientific Research (Master Thesis preparation)	28				30

OTHER INFORMATION

All courses of the program are open for Erasmus incoming students.

WEBSITE:

CONTACT PERSON: Mr. Gheorghe Militaru

Sustainable Business Excellency and Leadership / Nachhaltige Geschäftsexzellenz und Leadership in der Industrie (taught in German)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The Faculty of Engineering in Foreign Languages (FILS) established and developed the master program „ *Sustainable Business Excellency and Leadership*" together with renown Professors from Germany and Austria as well as international enterprises (Intel, Noerr, Stein& Partner Management Consulting, Linarson, Hewlett-Packard Enterprise and APT Resources etc.) with the aim of an qualifying specialists at the highest standards and requirements with international competencies for sustainable business development. The program is tailored for Engineers who intend to acquire within their career path business competencies as well as competencies related to sustainability with direct use in their workingenvironment, without being limited to them.

CURRICULA

			Weekly number of hours	

Year	Sem	Subject name	Lecture	Tutorial	Labwork	Project	ECTS
1	1	Soziale Kompetenzen 1	2	0	0	2	4
1	1	Nachhaltiges Personalmanagement	2	0	0	2	4
1	1	Ökologie und Umweltschutz	1	0	1	1	4
1	1	Kompetenzen im Ingenieurwesen 1/ Technikorientiertes nachhaltiges Entrepreneurship	2	0	0	2	4
1	1	Wissenschaftliche Forschung 1				12	10
1	2	Kostenmanagement	1	0	0	1	4
1	2	Online- & Social Media Marketing	2	0	0	2	4
1	2	Nachhaltiges Leadership	1	0	0	1	4
1	2	Nachhaltiges Industriegütermarketing	2	0	0	2	4
1	2	Bionik und nachhaltige Entwicklung/ Alternative Modelle nachhaltiger Entwicklung	2	0	0	2	4
1	2	Wissenschaftliche Forschung 2				12	10
2	3	Strategisches nachhaltiges Management	2	0	0	2	4
2	3	Nachhaltige Industrieinnovation und –forschung	2	0	0	0	4
2	3	Nachhaltige Geschäftsexzellenz	2	0	0	2	4
2	3	Geschäftsethik und Unternehmerische Sozialverantwortung	2	0	0	0	4
2	3	Unternehmenssimulation/ Management des virtuellen Unternehmens	2	0	2	0	4
2	3	Wissenschaftliche Forschung 3				12	10
2	4	Ethik	1			0	2
2	4	Masterthesis (Praktikum und Forschung)	0	0	0	27	28

OTHER INFORMATION

- All courses of the program are open for Erasmus incoming students and the program has incoming and outgoing Erasmus students for one or two semester each year.
- The bachelor program is carried out in cooperation with companies as Stein & Partner Management Consulting, Hewlett-Packard Enterprise und APT Resources and Services.

- The Master Thesis can be carried out in cooperation with enterprises or foreignuniversities.

WEBSITE:	http://ing.pub.ro/wp-content/uploads/2016/09/descriere-master-ngel.pdf
CONTACT PERSON:	Mr. Cristian Mustață

Industrial Business Administration / Geschäfts- und Industrieverwaltung (taught in German)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The Faculty of Engineering in Foreign Languages (FILS) established and developed the master program „ *Industrial Business Administration* ” together with renown Professors from the Technical Universities of Braunschweig, Darmstadt and Vienna as well as international enterprises (Intel, Noerr, Stein & Partner Management Consulting, Linarson, Hewlett-PackardEnterprise and APT Resources etc.) with the aim of an qualifying specialists at the highest standards and requirements with international competencies. The program is tailored forEngineers who intend to acquire within their career path business competencies with directuse in their working environment, without being limited to them.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Soziale Kompetenzen 1	2	0	0	2	4
1	1	Personalmanagement	2	0	0	0	4
1	1	Datenerfassung und –verarbetung in der Logistik	2	0	1	1	4
1	1	Ökologie und Umweltschutz	1	0	1	0	4
1	1	Kompetenzen im Ingenieurwesen und Recht/ Technikorientiertes Entrepreneurship	2	0	0	2	4
1	1	Wissenschaftliche Forschung 1				12	10
1	2	Kostenmanagement	1	0	0	1	4
1	2	Analyse und Synthese der Prozesse	2	0	2	0	4
1	2	Kompetenzen im Ingenieurwesen und Management	1	0	0	3	4
1	2	Nachhaltiges Industriegütermarketing	2	0	0	2	4

1	2	Bionik/ Alternative Entwicklungsmodelle	2	0	0	0	4
1	2	Wissenschaftliche Forschung 2				12	10
2	3	Strategisches Management	2	0	0	2	4
2	3	Industrieinnovation und –forschung	2	0	0	0	4
2	3	Geschäftsexzellenz	1	0	0	3	4
2	3	Energie und Umwelt	2	0	0	0	4
2	3	Prozessmodellierung in der Industrie/ Management des virtuellen Unternehmens	2	0	2	0	4
2	3	Wissenschaftliche Forschung 3				12	10
2	4	Ethik	1			0	2
2	4	Masterthesis (Praktikum und Forschung)	0	0	0	27	28

OTHER INFORMATION

- All courses of the program are open for Erasmus incoming students and the program hasincoming and outgoing Erasmus students for one or two semester each year.
- The bachelor program is carried out in cooperation with companies as Stein & PartnerManagement Consulting, Hewlett-Packard Enterprise und APT Resources and Services.
- The Master Thesis can be carried out in cooperation with enterprises or foreignuniversities.

WEBSITE:	http://ing.pub.ro/wp-content/uploads/2015/09/descriere-master-give.pdf
CONTACT PERSON:	Mr. Cristian Mustață

DOMAIN: ENERGY ENGINEERING

Bachelor programs

Master programs

Energy Engineering

FACULTY: Engineering in Foreign Languages in collaboration with Power Engineering Faculty

DESCRIPTION AND MAIN OBJECTIVES

The master program Energy Engineering is organized and coordinated by the Power Engineering (Energetics) Faculty and the Faculty of Engineering in Foreign Languages (FILS) with support and participation of the following faculties from UPB: Applied Chemistry and Materials Science, Mechanical Engineering and Mechatronics, Electronics, Telecommunications and Information Technology.

The focus of the program is to produce technically versatile graduates capable to tackle independently new problems and today challenges of scientific research, industrial applications, and management in various fields of energy engineering, including:

- flow, heat, and mass transfer phenomena in energetic systems,
- material science for energy applications and the environmental impact of energy production.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Renewable Energies, Energy Scenarios and Climate Protection	2	1	0	0	4
1	1	Energy Technologies in Mechanical Engineering	2	0	1	0	4
1	1	Chemistry and Material Science for Energy Engineering	2	0	2	0	4
1	1	Energy Finance	2	1	0	0	4
1	1	Continuum Mechanics and Thermodynamics	2	1	0	0	4
1	1	Scientific research	0	0	0	12	10
1	2	Modelling turbulent flows and heat transfer	2	0	2	0	4

1	2	Energy Technologies in Buildings – Smart Buildings	2	0	1	0	4
1	2	Energy systems I (classical energy and low emissions)	2	0	1	0	4
1	2	Energy Supply and Environmental Protection	2	0	1	0	4
1	2	Energy systems II (regenerative energy)	1	2	0	0	4
1	2	Environmental and economical aspects of energy conversion	1	2	0	0	4
1	2	Electrical Engineering and Information Technologies	1	2	0	0	4
1	2	Interdisciplinary research project	0	0	0	12	10
2	3	Electrochemistry	2	0	1	0	4
2	3	Chemical kinetics	2	0	1	0	4
2	3	Electro-chemistry in energy applications-converter devices	2	0	1	0	4
2	3	Material science of thin films and Rheology	2	0	2	0	4
2	3	Electro-chemistry in energy applications –storage devices	2	0	1	0	4
2	3	Principles of Carbon Capture and Storage	2	0	1	0	4
2	3	Scientific research	0	0	0	12	10
2	4	Scientific research, practice and dissertation elaboration	0	0	0	27	28
2	4	Ethics	1	0	0		2

OTHER INFORMATION

The master program Energy Engineering is organized and planned to be compatible, in curriculum and scientific research directions, with the master program Energy Science and Engineering from T.U. Darmstadt, Germany.
This program yearly receives incoming Erasmus students for one semester or one entire year.

WEBSITE:	http://ing.pub.ro/en/education/master/
CONTACT PERSON:	Mr. Cristian Dincă

DOMAIN: INDUSTRIAL ENGINEERING

Bachelor programs

Industrial Engineering (taught in English)

FACULTY: Industrial Engineering and Robotics

DESCRIPTION AND MAIN OBJECTIVES

The Industrial Engineering bachelor study program aims to help students acquire technical, managerial and economic skills in order to enroll in agile, sustainable, resilient companies designing and implementing competitive technologies and complex products in line with market requirements and regulations etc.
The study program covers basic engineering technical skills and deepens conception, design and implementation of manufacturing technologies, equipment and tools.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
First Year Compulsory subjects							
1	1	Technical Mechanics	2		2		5
1	1	General Chemistry	2		2		4
1	1	Mathematics 1	2	2			5
1	1	Computer Programming 1 *	3		2	1	5
1	1	Communication *	3		1		4
1	1	English language *	1		1		4
Optional Subjects							
1	1	Foreign Language 1 (French) Foreign Language 1 (Romanian)	1		1		3
Elective Courses							
1	1	Sport		1			2
1	1	Ethics	2	2			5
Compulsory subjects							
1	2	Mechanics of Materials 1	2	2	1	0	6
1	2	Mathematics 2	2	2	0	0	6
1	2	General Physics	2	0	2	0	5
1	2	Materials Science	2	0	2	0	5
1	2	Computer Programming 2 *	3	0	2	1	5

Optional Subjects							
1	2	European Culture and Civilization European Integration	2	1			3
Elective Courses							
1	2	Sport**		1			2
1	2	Practical stage	60 hours				2
1	2	Foreign Languages 2 - French	1		1		5
1	2	Foreign Languages 2 - English	1		1		5
1	2	Volunteering 1	70 hours				3
Second Year Compulsory subjects							
2	1	Technical Drawing	2	1	2		6
2	1	Mechanics of Materials 2	2	2	2		7
2	1	Probability and Statistics	2	2			5
2	1	Computer Aided Design 1	2		2	1	6
2	1	Databases *	2		2	2	6
Elective Courses							
2	1	Sport		1			2
2	1	Foreign Languages 3 - French	2		2		5
		Foreign Languages 3 - English	2		2		5
Compulsory subjects							
2	2	Tolerances Design	2		2		5
2	2	Materials Technology	2		2		5
2	2	Economics Lab	3	1			4
2	2	Computer Aided Design	3		1	2	6
		Machine Elements	2		1	2	6
Optional Subjects							
2	2	Modelling and Simulation Mechanical Vibrations	2		1		4
Elective Courses							
2	2	Sport		1			2
2	2	Practical stage	60 hours / 2 weeks				2
2	2	Foreign Languages 4 - French	2		2		5
2	2	Foreign Languages 4 - Romanian	2		2		5
2	2	Volunteering 1	70 hours				3
Third Year Compulsory subjects							
3	1	Mechanical Systems Design	2		2		4
3	1	Instrumentation and Measurement	2		2		4
3	1	System and Project Management*	2			2	6

3	1	Manufacturing Processes 1	2		2		6
3	1	Computer Aided Engineering	3		1	2	6
Optional Subjects							
3	1	Biomechanical structures Finite Element Analysis of Solids	2		2		4
Elective Courses							
3	1	Psychology	2		2		5
Compulsory subjects							
3	2	Production and Operation Management	2		1	2	5
3	2	Machine Tools	2		1	1	4
3	2	Robotics	2		2		4
3	2	Manufacturing Processes 2	3		1		2
3	2	Manufacturing Processes 2 - Project				2	2
3	2	Engineering Economics	2		2		4
3	2	Practical Internship	(300 hours/10 weeks)				6
Optional Subjects							
3	2	Supply Chain Management Industrial Management	2			2	3
Elective Courses							
3	2	Volunteering 1	70 hours				3
Fourth Year Compulsory subjects							
4	1	Computer Aided Manufacturing	3		1	2	6
4	1	Industrial Logistics	3	0	1	2	7
4	1	Product Design and Development	2		2		5
4	1	Product Design and Development - Project				2	2
4	1	Integrated Production Systems	3		1	2	7
Optional Subjects							
4	1	Leadership Lab Internship Lab	1		1		3
Elective Courses							
4	1	Intercultural cooperation	2	2			5
Compulsory subjects							
4	2	Entrepreneurship and Innovation*	4			2	6
4	2	Technology Strategy	3			3	7
4	2	Quality Assurance	3		1	2	7
4	2	Graduate project				4	4

4	2	Practical stage for Graduate Project/Interdisciplinary project European Project Semester				4	6
Elective Courses							
4	2	Organizational Management	2	2			5
4	2	Volunteering 4	70 hours				3
NB	** courses to be selected by Erasmus Incoming students, as part of the European Project Semester; other courses may be selected upon request* ***Two SPORT semesters will be mandatory for all four years*						

OTHER INFORMATION

All subjects of the program are fully taught in English. The program welcomes ERASMUS students, usually the group being quite heterogeneous, supporting the fostering of the multicultural dimension. Companies such as Siemens, Tenaris, Dr. Kocher, Hesper, AssaAbloy, Renault, General Turbo, Segula Technologies, Makita, Cameron, Arctic (Beko) a.s.o., offering internships for the 8-week long practical compulsory period, express the need for trained staff in terms of CAD/CAM, manufacturing processes modelling & control, production planning & scheduling, creativity in product development & design, intellectual property, quality assurance. Additive manufacturing linked to Robotics plays a central role in the students' projects, student teams being involved in design, manufacturing and processes improvement as topics of their final diploma papers.

WEBSITE:	http://www.imst.upb.ro/index.php/en/home/calendar/959-plan-de-invatamant-industrial-engineering
CONTACT PERSON:	Mrs. Irina SEVERIN

Applied informatics in industrial engineering / Angewandte Informatik im Wirtschaftsingenieurwesen (taught in German)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

According to specialist studies carried out at European and global level regarding the (fourth) industrial revolution that is currently taking place, at the end of this transformation process, successful industrial companies will truly become digital enterprises, having physical products at the base, supplemented of digital interfaces and innovative data services and will collaborate with customers and suppliers in digital industrial ecosystems. The understanding and use of concepts and techniques offered by computational technology is pursued by disciplines such as Applied Computer Science, Computer Programming and Programming Languages, Computer Aided Graphics, Finite Element Method, Technical Drawing and Computer Aided Design, which provide the necessary knowledge and skills their application in mechanical engineering, electronics, telecommunications, automation, robotics, energy and technological technology, environmental technology, etc.
The technical skills are complemented by those of management, communication, of culture and last but not least teamwork in projects .
The specialization ensures, through its Education Plan, all the knowledge and practical skills necessary for the integration of graduates on the labor market in the field for which they have been trained.

CURRICULA

OTHER INFORMATION

All the courses of the program are open for Erasmus incoming students and the program has incoming and outgoing Erasmus students for one or two semesters each year.
The bachelor program is carried out in cooperation with reputed companies: Stein & Partner Management Consulting, Bosch Romania, Selgros Cash and Carry Romania, Honeywell Garret Romania, IBM Romania, Microsoft Romania, Hewlett-Packard Enterprise und APT Resources and Services.
The Bachelor Thesis can be carried out in cooperation with enterprises or foreign universities.

WEBSITE:	http://ing.pub.ro/de/education/licence/
CONTACT PERSON:	Mr. Cristian- George DRAGOMIRESCU

Master programs

Industrial Engineering (taught in English)

FACULTY: Industrial Engineering and Robotics

DESCRIPTION AND MAIN OBJECTIVES

The 4.0 industrial revolution or the intelligent enterprise appear as a real market need for the master study programme "Industrial Engineering". Companies as Siemens, Tenaris, Dr. Kocher, Hesper, Assa Abloy, Renault, General Turbo, Segula Technologies, Makita, Cameron a.s.o. express the need for trained staff in terms of CAD/CAM, manufacturing processes modelling & control, advanced production planning & scheduling, E-business in industrial engineering, innovation & creativity in product development & design, intellectual property, factory simulation, quality tools & performance management in the competitive global world. Teamwork is privileged, the students being enrolled in numerous team projects of scientific research or complex products design.
The master programme is aiming to deepen the competences acquired during the bachelor study programme Industrial Engineering, but it may be attended by graduates in different branches of Engineering, too. The programme is designed as an answer to companies needs.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Experimental Research	2	0	2	0	4
1	1	Mechanical Behaviour of Engineering Materials	2	0	0	2	6
1	1	Advanced Production Planning and Scheduling	2	0	2	0	7
1	1	Experimental Research - Project	0	0	0	2	3
1	1	Scientific research 1/Practical stage 1	12				10

1	2	Additive Manufacturing	2	0	2	0	4
1	2	Mechatronics and Robotics	2	0	2	2	6
1	2	Industry 4.0	2	0	2	2	7
1	2	Additive Manufacturing - Project	0	0	0	2	3
1	2	Scientific research 2/Practical stage 2	12				10
2	3	Factory Simulation	2	0	2	0	5
2	3	Technical Entrepreneurship for SME	2	0	2	0	4
2	3	Quality Engineering and Management	2	0	0	2	4
2	3	E-business in industrial engineering	2	0	0	2	5
2	3	Scientific research 3/Practical stage 3	11				10
2	4	Practical work, scientific Research (Master Thesis preparation)	28				30

OTHER INFORMATION

The program welcomes ERASMUS students, usually the group being quite heterogeneous, supporting the multicultural dimension fostering. Teamwork is organized in order to join home and incoming students. The research activity is aimed to deepen the courses, butallowing creativity and critical thinking development. Students have the opportunity to participate in a dedicated scientific session, the best contributions being awarded and published in the faculty scientific journal Industrial Engineering, event appreciated by students and companies, too, as certain students' contributions present practical prototypes or innovative solutions.

WEBSITE:	http://www.imst.pub.ro/index.php/en/masterat/planuri-de-invatamant
CONTACT PERSON:	Prof. Irina SEVERIN

Conception Intégrée des Systèmes Technologiques (Enseigné en Français)

FACULTY: Faculté Génie industrielle et Robotique (F.I.I.R)

DESCRIPTION AND MAIN OBJECTIVES

L'objectif principal est de compléter les connaissances des jeunes ingénieurs et les préparer à répondre aux exigences et aux problèmes de la société moderne, tant en termes de formation professionnelle quant en termes de formation personnelle.

Conception Intégrée des Systèmes Technologiques (CIST) a été le premier master de recherche de la faculté **d'Ingénierie Industrielle et Robotique** (2003) qui prépare les ingénieurs dans la conception et la fabrication assistée par ordinateur de systèmes technologiques pour obtenir des produits compétitives, dans des conditions de qualité, de productivité, et de coût optimise , avec tout ce qui concerne ce processus (étude de faisabilité, analyse de la valeur, étude de marché, créativité, CAO-FAO etc.). Les étudiants ont à la disposition l'infrastructure du Centre National de Recherche OPTIMUM: des équipements (Machine-outil, Robots, équipements des mesure et contrôle) et des logiciels performants commeCAO-FAO. Pendant les deux années d'études, un cours de langue française techniquesest également programmé.

Le master CIST promeut une méthode d'enseignement basée sur des problèmes qu'on doit résoudre et sur la pratique d'épreuves centrées sur les besoins des étudiants et aussi sur les besoins actuels de la société industrielle.

Dans le cadre de master les étudiants sont tout le temps en ligne avec les dernières demandes comme

conception et application additive, Industrie 4.0. Chaque année on a des professeurs des universités françaises (ENSAM Cluny, Bordeaux 1) qui donnent des cours à ce master.
Les compétences spécialisées qu'on va avoir les étudiants à la fin des années de master sont:

- La capacité d'appliquer des techniques d'analyse de la valeur, la faisabilité et la gestion de projet dans le développement et le management de projets industriels pour augmenter l'efficacité et optimiser les processus de production.
- La conception innovante des produits pour la modélisation et la conception tridimensionnelle par des programmes modernes (CATIA V5, DESIGNER), de simulation et d'optimisation technico-économique des flux de production (DELMIA V5, Quest D5).
- Conception et fabrication assistée par ordinateur des produits, en utilisant des systèmes CAO-FAO (WORKNC, EDGECAM, CATIA V5 ANSYS, ANSA, Wincam, Heidenhain etc.).
- L'exploitation, la surveillance et l'évaluation expérimentale des systèmes technologiques.

CURRICULA

An	Sem	Sujet	Heures par semaines				ECTS
			Cours	TD	TP	Projet	
1	1	Systèmes intégrés de production	2	0	2	0	5
1	1	Modélisation mathématique pour l'ingénierie industrielle	2	2	0	0	5
1	1	Analyse de la valeur et analyse fonctionnelle	2	0	0	1	4
1	1	Entrepreneuriat industriel	2	1	0	0	4
1	1	Française de spécialité 1	0	2	0	0	2
1	1	Recherche scientifique et pratique	0	0	0	12	10
1	1	Total	28				30
1	2	Simulation de systèmes intégrés	2	0	0	2	5
1	2	Fabrication automatisée	2	0	1	0	4
1	2	Matériaux : modélisation des comportements et applications	2	0	2	0	5
1	2	Techniques et outils pour le développement de la créativité	2	0	1	0	4
1	2	Française de spécialité 2	0	2	0	0	2
1	2	Recherche scientifique et pratique	0	0	0	12	10
1	2	Total	28				30
2	3	Conception et fabrication intégrées	2	0	0	1	5
2	3	L'industrie 4.0 - numérisation de l'usine	2	0	2	0	5
2	3	Méthodes expérimentales pour l'évaluation des systèmes de fabrication	2	0	2	1	5
2	3	Les instruments de la qualité dans les systèmes industriels modernes	2	0	2	0	5
2	3	Recherche scientifique, pratique et élaboration de dissertation	0	0	0	12	10

OTHER INFORMATION

La plupart des étudiants sont embauchés dans de prestigieuses sociétés en Roumanie avec lesquelles on a des partenariats comme: Renault Technologies, HEXAGON, Romaero SA, IMSAT, AKKA Technologies, Mazak, SEGULA, Honeywell, Oracle, Euroavia, Infinit Solutions, ainsi que dans des sociétés de l'étranger comme: SNCF, Peugeot, Virginia Tech, CHRYSLER, Jaguar Land Rover, Mitsubishi Power Systems Europe, des sociétés basées en Allemagne, au Bangladesh, à Abu-Dhabi, et autres.

Les étudiantes peuvent bénéficier des mobilités Erasmus+ pour un an et effectuer des activitésdans une institution partenaire de l'Europe. Les compétences professionnelles acquises peuvent se poursuivre dans le cadre d'un doctorat.

WEBSITE:	http://fiir.pub.ro/index.php/ro/masterat/planuri-de-invatamant
CONTACT PERSON:	M. Dorel ANANIA

Ingénierie des Systèmes Industriels (Enseigné en Français)

FACULTY: Faculté d'Ingénierie en Langues Étrangères

DESCRIPTION AND MAIN OBJECTIVES

Ingénieur polyvalent, l'ingénieur "Systèmes Industriels" réunit des compétences d'ingénieur et d'administrateur des fonctions techniques de l'entreprise. S'appuyant sur des connaissances et compétences dans les sciences fondamentales et sociales de l'ingénieur, il associe et coordonne les interfaces entre la maîtrise des processus industrielset le pilotage des systèmes industriels complexes et intégrés.

Objectives:

- Préparer des professionnels en ingénierie des systèmes industriels, avec un éventail de compétences techniques, économiques et d'organisation nécessaires pour planifier, diriger, suivre et analyser les projets et processus industriels complexes.
- Compléter la formation des diplômés de premier cycle de l'enseignement supérieur (trois ans ou plus) avec des connaissances en sciences techniques, économiques et sociales, pourmieux répondre aux exigences du marché du travail;

Compétences :

- Connaissances en sciences techniques, économiques et sciences humaines et sociales;
- Maîtrise et suivi des diverses ressources de l'entreprise (humaines, techniques etfinancières);
- Vision globale sur l'activité de l'ingénieur dans l'entreprise;
- Capacité à intervenir sur l'ensemble d'un processus industriel;
- Nombreux secteurs d'activités: ingénierie, industrialisation, production, qualité, systems d'informations, logistique, gestion de projet, création d'entreprise

CURRICULA

			Heures par semaines	

An	Sem	Sujet	Cours	TD	TP	Projet	ECTS
1	1	Méthodes d'optimisation	2		1		4
1	1	Modèles économiques	2	1			4
1	1	Analyse de la valeur et analyse fonctionnelle	2	1			4
1	1	Conception des produits industriels	2			1	4
1	1	Techniques de planification des projets	2		2		4
1	1	Recherche scientifique 1	14 semaines x 12 h				10
1	2	Analyse et suivi des projets	2	1			4
1	2	Eléments d'analyse financière	2	1			4
1	2	Eléments d'ergonomie	2		1		4
1	2	Gestion de la production	2		2		4
1	2	Conception assistée par ordinateur	2		1		4
1	2	Recherche scientifique 2	14 semaines x 12 h				10
2	3	Marketing	2		1		4
2	3	Système de management de la qualité	2		1		4
2	3	Analyse des coûts pour les projets industriels	2			2	4
2	3	Systèmes d'organisation des entreprises	2			1	4
2	3	Management des ressources humaines	2	1			4
2	3	Recherche scientifique 3	14 semaines x 12 h				10
2	4	Recherche, internship, élaboration de la thèse	0	0	0	0	28
2	4	Etique	1				2

OTHER INFORMATION

- Double diplôme avec l'Institut National Polytechnique de Toulouse (INPT), France;
- Le mastère *Ingénierie des Systèmes Industriels* continue, depuis 25 ans, sa collaboration avec INPT, plus de 150 étudiants (roumains et étrangers) ayant obtenu des doublesdiplômes pendant ces années;
- Les étudiantes peuvent bénéficier des mobilités Erasmus+ pour un an et effectuer des activités (études ou placement) dans les institutions partenaires de l'Europe.
- Chaque année, le mastère *Ingénierie des Systèmes Industriels* reçoit des étudiants européens, pour un ou deux semestres, par l'intermède des accords Erasmus;
- Dans les dernières années, des nombreux étudiants provenant des pays non-UE (Maroc, Tunisie, Algérie, Cameroun), ont participés à ce master, avec des très bons résultats;
- Les compétences professionnelles acquises peuvent se poursuivre dans le cadre d'undoctorat;
- Les étudiants diplômés de ce master sont employés dans des entreprises prestigieuses, en Roumanie ou à l'étranger.

WEBSITE:	http://ing.pub.ro/admitere-master-ingineria-sistemelor-industriale/
CONTACT PERSON:	M. Virgil DUMBRAVA

DOMAIN: CHEMICAL ENGINEERING

Bachelor programs

Chemical Engineering (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The program of Chemical Engineering aims at providing graduates with competencies and skills according to the European Qualifications Framework regarding the area of Chemical Engineering. A series of optional classes offer knowledge on polymer science (synthesis, characterization, processing, materials and biomaterials) or organic chemistry (natural products, catalysis, tensioactive compounds, dyes).

Graduates can work in all areas of chemistry and chemical engineering, such as: research, manufacture, petrochemistry, organic chemistry, rubber industry, plastics industry, cosmetics, paints, environmental protection, polymer recycling, biomaterials, etc.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
First Year Compulsory subjects							
		Basic Subjects					
1	1	Calculus 1	3	1			6
1	1	Linear Algebra	2	1			4
1	1	Inorganic Chemistry 1	3	2			4
1	1	Analytical Chemistry 1	2		3		4
		Basic Engineering Courses					
1	1	Introduction to information technology	1		2		3
1	1	Engineering Graphics I	1		1		3
		Humanities and Social Sciences					
1	1	Professional Communication		2			2
1	1	European Culture and Civilization 1	1	1			2
		Optional Subjects					
		Humanities and Social Sciences					
1	1	Foreign Language B (Spanish Language I)		2			2
1	1	Physical Education I		2			2
		Free Choice Subjects					
		Complementary topics					

1	1	English for Engineering Academic Study 1		2			2
		Humanities and Social Sciences					
1	1	Romanian Language and Culture (for foreigners)		2			2
		Compulsory subjects					
		Basic Subjects					
1	2	Calculus 2	3	1			6
1	2	Physics I	2		1		5
1	2	Inorganic Chemistry 2	2	2	2		5
1	2	Analytical Chemistry 2	2		2		3
1	2	Programming Languages	1		1		3
		Basic Engineering Courses					
1	2	Transition Metals Chemistry	2	1			2
1	2	Theoretical Mechanics	1	1			2
		Specialties					
1	2	Collaborative Work 1		2			2
		Humanities and Social Sciences					2
1	2	European Culture and Civilization 2	1	1			
		Optional Subjects					
		Humanities and Social Sciences					
1	2	**Foreign Language B (Spanish Language 2)**		2			2
		Free Choice Subjects					
		Complementary topics					
1	2	**English for Engineering Academic Study 2**	1	1			2
		Humanities and Social Sciences					
1	2	**Romanian Language and Culture (for foreigners)**		2			2
1	2	**Pedagogy I**	2	2			5
Second Year Compulsory subjects							
		Basic Subjects					
2	1	Probabilities and Statistics	1	1			2
2	1	Physics 2	2		1		4
2	1	Physical Chemistry 1	3	2			5
2	1	Physical Chemistry 1 Lab			2		2
2	1	Organic Chemistry 1	3	1	2		6
		Basic Engineering Courses					
2	1	Strength of Materials 1	2	1			4
2	1	Electrical Engineering 1	2	1			3
		Specialties					
2	1	Collaborative Work II		2			2

		Economics					
2	1	Microeconomics	1	1			2
		Free Choice Subjects					
		Humanities and Social Sciences					
2	1	Romanian Language and Culture (for foreigners)		2			2
		Compulsory subjects					
		Basic Subjects					
2	2	Physical Chemistry 2	3	2			6
2	2	Physical Chemistry 2 Lab			2		4
2	2	Organic Chemistry 2	3	1	2		7
		Basic Engineering Courses					
2	2	Instrumental Analysis in Organic Chemistry	2		2		6
2	2	Numerical Methods	2		2		3
		Specialties					
2	2	Technical Writing		2			2
		Economics					
2	2	Macroeconomics	1	1			2
		Free Choice Subjects					
		Humanities and Social Sciences					
2	2	Romanian Language and Culture (for foreigners)		2			
Third Year Compulsory subjects							
		Basic Subjects					
3	1	Organic Chemistry 3	2		2		4
		Basic Engineering Courses					
3	1	Transport Processes 1	3	1	2		6
3	1	Organic and Composite Materials	3		2		5
3	1	Electrochemistry	2		2		4
3	1	Reaction Mechanisms	2	1			4
3	1	Organic Technologies	2		2		5
		Management					
3	1	Money and Banking	1	1			2
		Compulsory subjects					
		Basic Engineering Courses					
3	2	Inorganic Industrial Chemistry	2	1			2
3	2	Biochemistry	2		2		3
3	2	Organic Technologies I	2		2		5
3	2	Oxide and Metallic Materials	3		2		4
3	2	Macromolecular Compounds I	3		2		4
3	2	Unit Operations I	2	1	1		4
		Specialties					

3	2	Practical Workshop					6
		Management					
3	2	Business Administration	1	1			2
Fourth Year Compulsory subjects							
		Basic Engineering Courses					
4	1	Unit Operations 2	3	1	1	1	6
4	1	Macromolecular Compounds 2	3		1		5
		Management					
4	1	Fundamentals of Management	1		1		2
		Optional Subjects					
		Specialties A – Organic Chemistry**)					
4	1	Pesticides	2				3
4	1	Stereochemistry	2	1			3
4	1	Drugs	2				2
4	1	Fine Organic Syntheses			5		5
4	1	Dyes	2		2		4
		Specialties B – Polymer Science**)					
4	1	Polymer Physics	3		3		6
4	1	Technologies of Polymer Synthesis	3		3		6
4	1	Biopolymers and Bio-composites	2		2		5
		Compulsory subjects					
		Specialties					
4	2	Chemical Reactors	3		2	1	6
4	2	Diploma Project				4	1-
		Management					
4	2	Industrial Management	1	1			2
		Optional Subjects					
		Specialties A – Organic Chemistry*)					
4	2	**Petrochemical and Carbochemical Technologies**	2		1		2
4	2	**Tensioactive Compounds**	2		2		3
4	2	**Catalysis**	2		2		3
4	2	**Natural Products**	2		1		2
4	2	**Pollution and Depollution**	2				2
		Specialties B – Polymer Science*)					
4	2	**Polymer Processing**	3		2		4
4	2	**Industrial Polymer Materials**	3		2		3
4	2	**Adhesives, Paints and Putties**	2		1		3
4	2	**Polymer Recycling**	2		1		2

OTHER INFORMATION

This program receives incoming Erasmus+ for one semester or an entire year.

There are many partnerships with various research and production companies where students participate in internships.

The university research centers offer students and graduates the possibility of participating in research activities. For example, the Center for Advanced Research on New Materials, Products and Innovative Processes - CAMPUS, integrates several labs, equipped at European standards, that cover various scientific areas. The Advanced Polymer Materials Group (APMG), as part of the Faculty of Applied Chemistry and Materials Science from the University POLITEHNICA of Bucharest, dedicates a lot of research to the field of Polymer Science and Engineering.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mrs. Adriana LUNGU

Master programs

Smart Polymers and Biopolymers (taught in English)

FACULTY: Chemical Engineering and Biotechnologies

DESCRIPTION AND MAIN OBJECTIVES

Smart Polymers and Biopolymers (SPB) program focuses on the companies demands from the industry of polymers and biopolymers. These refer to novel fabrication techniques for polymer products such as: advanced polymer membranes, special adhesives with higher lifetime, conductive materials with specific properties for each substrate, innovative processing methods for thermoplastics in automotive and electrochemical industry, polymeric nanomaterials with carbonic content etc.
The new master program is oriented on top subjects in the field of smart polymers: smart membranes, smart inorganic polymers, chemical modification of polymers and biopolymers for medical and biological applications, protein engineering, non-destructive testing methods for polymers and biopolymers, bioreactors for smart materials, top methods in polymer processing etc.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Smart polymer membranes	2	0	2	0	4
1	1	Computer-aided design of polymers and biopolymers	2	0	0	2	4
1	1	Smart inorganic polymers	2	0	1	0	4
1	1	Smart adhesives	2	0	1	0	4
1	1	Advanced conductive polymers	1	0	2	0	4
1	1	Research practice	12				10

1	2	Advanced characterization of polymers and biopolymers	2	0	2	0	4
1	2	Top methods for polymer processing	2	0	2	0	4
1	2	Chemical modification of polymers and biopolymers for medical and biological applications	2	0	2	0	4
1	2	Biopolymers based hybrid materials	2	0	2	0	4
1	2	Proteins engineering	2	0	2	0	4
1	2	Research practice	10				10
2	3	Microscopy testing of polymers and biopolymers	2	0	2	0	4
2	3	Oligomers for advanced materials	2	0	1	0	4
2	3	Bioreactors for smart materials	2	0	1	0	4
2	3	Additives for polymer and biopolymers	2	0	2	0	4
2	3	Carbon-based polymeric nanomaterial for bioengineering applications	2	0	2	0	4
2	3	Research practice	12				10
2	4	Research practice	20				20
2	4	Prepare dissertation	10				10

OTHER INFORMATION

All the courses of the program are open for Erasmus incoming students.
We also developed strong partnerships with different European Universities: University of Angers, France; University of Patras, Greece; ETH Zurich, Switzerland; University of Bochum, Germany; Catholic University of Leuven, Belgium; University of Strasbourg, France; New University of Lisbon, Portugal; University of Ghent, Belgium; Arctic University, Norway.

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WEBSITE:	http://www.chimie.upb.ro/educatie/masterat-smart-polymers-and-biopolymers
CONTACT PERSON:	Prof.dr.eng. Horia Iovu, master coordinator, horia.iovu@upb.ro

Biomaterials for tissue engineering (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The master's program proposed the following general objectives:

- Specialization and improvement of pre-Bologna university graduates: - engineers; - chemists; - biochemists; - doctors; - biologists; - pharmacists; - expert in the above enumerated categories.
- Empowering and improving the need of undergraduate/ graduates of Bologna cycle for carrying out research, to search quality consultancy and expertise in the field of medical engineering and biomaterials science.

With the proposed courses - which include teaching, practice and research – the master program ensures both a fundamental and applied training in engineering sciences (especially materials science and bioengineering) and biomedical applications. The master program brings together basic and applied sciences disciplines. In the context of European requirements, it is necessary the development

of trained specialists able to work in proper conditions of safety and quality in research laboratories and bio-medical facilities, and to develop and implement new approaches in regenerative medicine, and biomaterials and tissue engineering. This program aims to combine between engineering, chemistry, materials science, biology, anatomy, physiology and physics, ensuring the development, improvement and introduction in the national and international HR staff very competitive specialists on an emerging and interesting area- medical engineering. The program directly addresses the staff working in the fields of materials engineering, regenerative medicine, development of prosthetic devices, biochemistry, pharmacy, and all those interested in the vast field of medical engineering and biomaterials for applications in tissue regeneration. Knowing the great national and international interest, new approaches and methods for obtaining, investigation and analysis of materials with biomedical applications has become a necessity acute for those working in the fields of medical engineering and regenerative medicine.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Lab work	Project	
1	1	Tissue biochemistry	2	0	0	0	4
1	1	Cell and tissue biology	2	0	2	0	4
1	1	Stem cells and regenerative medicine	1	0	1	0	4
1	1	Nano medicine: from concept to current and emerging applications	2	0	2	0	4
1	1	Nano biomaterials for tissue engineering	2	0	0	0	4
1	1	Research practice	12				10
1	2	Molecular and cellular engineering	2	0	2	0	4
1	2	Biomaterials characterization by advanced techniques	1	0	3	0	4
1	2	Tissue engineering and regenerative medicine	2	0	2	0	4
1	2	Debilitating diseases of tissues	2	0	0	0	4
1	2	Biomedical devices and prostheses	2	0	0	0	4
1	2	Research practice	12				10
2	3	Nano biotoxicology	2	0	0	0	4
2	3	Advanced techniques for the characterization of biological active substances	1	0	3	0	4
2	3	Medical imaging for tissue reconstruction and regeneration	1	0	3	0	4
2	3	Mechanisms of tissue regeneration and remodeling	2	0	0	0	4
2	3	*In vitro* and *in vivo* models for tissue reconstruction and regeneration	2	0	2	0	4

2	3	Research practice	12	10
2	4	Research practice and prepare dissertation	27	28

OTHER INFORMATION

Master program entitled Biomaterials for tissue engineering will provide: developing skills in sciences, particularly medical engineering, materials science and engineering and biochemistry (deepening and broadening of knowledge, skills and abilities necessary for training specialists); acquisition of double / multiple skills by studying interdisciplinary sciences during the master's program; formation of skills related to interpersonal communication, teamwork, rapid insertion of human resources on the market; empowerment and improvement of university graduates with specialized knowledge (fundamental science - applied science): Bologna, pre-Bologna students, engineers, biochemists, physicians, biologists etc.; acquiring skills to identify and solve current biomedical problems and asses efficiency of currently available ones; practicing communication skills and problem solving (questioning); developing skills necessary for the design of biomaterials applicable in molecular, cellular and / or tissue engineering; development of interdisciplinary skills in line with policies and strategies specific in various medical specialties in the fields of engineering, material science, biochemistry, medicine: theoretical and applicative knowledge regarding the potential of biochemistry and implications in tissue reconstruction and regeneration of tissue, theoretical and practical Skills will enable student's work in adequate conditions in research laboratories and innovation in the field of regenerative medicine, but also in some industrial areas that are aiming at the development of biomedical instruments on regeneration and remodeling of tissues and organs, such as for obtaining organs and tissues in vitro correlation of the properties of morphological, physiological and molecular traits of cells and tissues with the development of tissues, organs and organisms with specific characteristics and the possibility of handling them through the application of engineering techniques; use the processes and principles of cellular signaling and tissue development to develop methods and approaches for efficient regeneration and tissue engineering; preparation and characterization of biomaterials for biomedical use, mainly in regenerative medicine; the application of knowledge and skills acquired through learning and practice work in a dedicated tissue culture laboratory by using biomaterials; knowledge and understanding of stem cell biology and applications, as well as the modalities of their differentiation to different cell types and molecular mechanisms that participate in tissue regeneration; using the principles for understanding biological processes to obtain reproducible results and the appropriate interpretation of the information provided by them; understand and correlation of physiological processes with molecular and cellular engineering approaches to change / develop applications useful for tissue engineering and regeneration; linking physiological processes with different molecular and genetic engineering methods applicable at the molecular and supramolecular structures; using engineering principles, molecular and supramolecular assemblies useful in the design of new structures for tissue regeneration or reconstruction and modification of cells for biomedical applications; Determine or check the main structural and compositional characteristics of biomaterials, by using advanced characterization methods and techniques; linking concepts of materials science with notions of biophysics, biology and anatomy adequate to characterize the structural, micro and nanostructure of biomaterials, given the interdependence between structure and physicochemical properties of functional biomaterials; Linking various functional, morphological and metabolic features with debilitating tissue disorders; understanding the necessity of development of prosthetic devices and medical interest materials for improving the quality of life in patients with debilitating diseases of different tissues or to increase their life expectancy; use a variety of traditional and complementary methods of training and evaluation - questioning, theoretical and practical projects; ability to analyze and evaluate the work in the field and the gained experience; ability compiling research projects and exploitation of research results; double degree is possible, incoming Erasmus students, partnership to industry/companies, possibility to develop master thesis related to industry, etc.).

WEBSITE: http://ing.pub.ro/education/master/

CONTACT PERSON: Mr. Alexandru Mihai GRUMEZESCU

Advanced Materials Processing and Design – (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The master program proposes the following general objectives:

- Specialization and improvement of bachelor graduates in the field of processing, characterisation and testing of the materials. The following candidates are eligible for admission: i) engineers, especially chemical, materials science, medical engineers, bioengineers, etc.; ii) chemists from different topics including analytical chemists, environmental chemists which are extensively using materials in their activity; iii) biochemists; iv) medical doctors, both human and veterinary divisions; v) biologists; vi) pharmacists; vii) experts in the above enumerated categories.

- Empowering and improving the need of undergraduate/ graduates of Bologna cycle for carrying out research, to search quality consultancy and expertise in the field of processing and testing the quality of the developing materials and devices.

With the proposed courses - which include teaching, practice and research – the master program ensures both fundamental and applied training in materials processing, design, characterisation and testing of materials and derived devices in the field of industrial, medical,environmental, energy, electric or electronic applications. The program is mainly focused on developing knowledge and skills to enable graduates to identify current problems/challenges and especially to propose solutions and to manufacture materials appropriate to the desired application.

The master program brings together basic and applied sciences disciplines. The structure ofthe study plan is especially developed to assure one semester of mainly basic disciplines whilethe most of the second semester of the first year is devoted to the main processing techniques to manufacture 0-3D materials according to their envisaged applications. The first semester ofthe second year will be devoted to the discovery of the most important characterization and testing techniques and such, allowing in the second semester full-time involvement for research activities and finalizing the dissertation.

In the context of European and Global Requirements related to development of novel or improved materials, with increasing standards and diversity, with an accentuated degree of decentralisation it is important to learn young master students to develop materials with imposed characteristics and performances. Currently, by our knowledge, in Romania there is no such master fully devoted to processing and design of materials and absolvents can easily find positions in existing SMEs or, with the aim of the Start-up Nation or other programs to develop their proper business. This program aims to combine chemistry, engineering, materials science with biomedical,environmental, energy, electric or electronic applications.

CURRICULA

			Weekly number of hours	

Year	Sem	Subject name	Lecture	Tutorial	Labwork	Project	ECTS
1	1	Advanced methods of synthesis of substances and materials	2		2		5
1	1	Advanced Methods of Surfaces and Interfaces Functionalization	2		1		5
1	1	Correlations of composition – synthesis – processing – properties in term of functions of use of materials	2		2		5
1	1	CAD of Materials with Predetermined Morpho-Structural Features	2		1	**2**	5
1	1	How to prepare a scientific work		2			2
1	2	Multifunctional and smart oxide materials	2		0		4
1	1	Scientific Research	14				10
1	2	Advanced manufacturing techniques of 3D materials	2		2		5
1	2	Advanced manufacturing techniques of 2D materials	2		2		5
1	2	Advanced manufacturing techniques of 1D materials	2		1		3
1	2	Advanced manufacturing techniques of 0D materials	2		1		3
1	2	Scientific Research	14				10
2	3	Advanced microscopy techniques	2	-	1	-	4
2	3	Advanced Techniques of Spectrometric Analysis	2	-	1	-	4
2	3	X-Ray Diffraction and Fluorescence	2	-	1	-	3
2	3	Complex thermal analysis	2	-	1	-	4
2	3	Design and manufacturing of materials with special applications	0	-	-	2	3
2	3	Research practice	14				10
2	4	Research practice and dissertation preparation	27				28
2	4	Ethics	1				2

OTHER INFORMATION

Master program entitled Advanced Materials Processing and Design will provide:

- developing skills in sciences, particularly, processing, design, characterization and testing of 0-3D materials (deepening and broadening of knowledge, skills and abilities necessary for the absolvents of this master program);
- acquisition of multiple skills by studying interdisciplinary sciences during the master's program; the core of the master program being the need of processing of materials and to develop materials

and devices for household, medical, environmental, energy, electric and electronic applications;

- formation of skills related to interpersonal communication, teamwork, rapid insertion of human resources on the market;
- empowerment and improvement of university graduates with specialized knowledge (fundamental science - applied science) able to adapt for the need of the market being able to use their knowledge in various fields, as presented above;
- acquiring skills to identify the challenges in the fields of materials sciences and various connected fields (which are using materials) and solve these issues based on the acquired theoretical knowledge and practical skills:

- developing knowledge, capacity of modern documentation and practical skills necessary for the design and manufacture materials for household applications;
- developing knowledge, capacity of modern documentation and practical skills necessary for the design and manufacture materials for biomedical applications;
- developing knowledge, capacity of modern documentation and practical skills necessary for the design and manufacture materials for energy applications;
- developing knowledge, capacity of modern documentation and practical skills necessary for the design and manufacture materials for electronic applications;

- theoretical and practical skills will enable student's work in adequate conditions in research laboratories and innovation in the above mentioned fields, but also in any industrial areas dealing with materials;
- correlation of the properties and performances of the materials with the morphology, composition and routes of processing;
- Determine or check the main structural and compositional characteristics of the materials, by using advanced characterization methods and techniques;
- Linking concepts of materials science with notions of physics, mechanic, biology, electric characteristics and evaluation of the performances of these materials according to the envisaged applications;
- Ability compiling research projects and exploitation of research results
- Practicing communication skills and problem solving (questioning)

All subjects of the program are open for Erasmus exchanges.

WEBSITE:	http://ing.pub.ro/education/master/
CONTACT PERSON:	Mr. Anton FICAI

Innovative Technologies for Secondary Raw Materials (taught in English)

FACULTY: Chemical Engineering and Biotechnology

DESCRIPTION AND MAIN OBJECTIVES

Master in Innovative Technologies for Secondary Raw Materials developed at the Faculty of Chemical Engineering and Biotechnology (the new name of the Faculty of Applied Chemistryand

Materials Science) offers undergraduates in various fields of specialization: chemistry and chemical engineering, engineering sciences, economics, the opportunity to acquire professional skills, which will allow them access to economic and social life. with adequate training in the field of chemistry and chemical engineering and, in particular, innovative technologies for the identification of secondary sources of raw materials, for the sustainable development of society. Target group: technical / economic graduates.

The following competencies and skills for Innovative Technologies for Secondary Raw Materials graduates will be achieved:

Professional skills:

- Ability to understand the concepts of engineering sciences, their theory and their applicability in the field of obtaining raw materials from secondary sources
- The ability to perform theoretical and experimental studies for secondary raw material recovery processes, by collecting and analyzing data, to compare the conventional technological process with innovative methods.
- Ability to propose an appropriate technology for obtaining raw materials from acertain material / product.
- Ability to develop methods for obtaining high quality materials from secondary raw materials.
- Ability to use the knowledge gained to solve complex problems in the field of secondary raw material recovery.
- Ability to use the concepts of clean technology and life cycle assessment (LCA) to highlight process sustainability.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Secondary Raw Materials and Circular Economy	2	2	0	0	5
1	1	Compositional Analysis & Secondary Raw Materials Identification	2	0	2	0	5
1	1	Kinetic and thermodynamic aspects of SRMs recovery	2	0	2	0	5
1	1	Phase diagrams and phase equilibria in solid state	2	0	2	0	5
1	1	Research/Practice 1	0	0	0	12	10
1	2	Recovery of metals from industrial waste/endof-life products	2	0	2	0	5
1	2	Biotechnologies for minerals and critical raw materials recovery	2	0	0	1	5

1	2	Electrochemical recovery (ER) technologies of metals vs conventional processes	2	0	1	0	5
1	2	Advanced technologies for polymers recycling and reusing	2	0	2	0	5
1	2	Research/Practice 2	0	0	0	12	10
2	3	Secondary raw materials: Process flow diagrams and case studies	1	0	0	1	5
2	3	Conversion of food waste to high-value chemicals	2	0	1	0	5
2	3	Eco-friendly hybrid strategies	2	0	2	0	5
2	3	Economic and energy costs of the recovery of secondary raw materials	1	0	0	1	5
2	3	Research/Practice 3	0	0	0	12	10
2	4	Research/Practice for the Dissertation	0	0	0	27	28
2	4	Ethics	1	0	0	0	2

OTHER INFORMATION

All subjects of the program are open for Erasmus incoming students.

WEBSITE:	http://en.chimie.upb.ro/
CONTACT PERSON:	Prof. Ovidiu OPREA

DOMAIN: TRANSPORTATION ENGINEERING

Bachelor programs

Master programs

Green, Smart and Integrated Transport and Logistics (taught in English)

FACULTY: Faculty of Transport (UNESCO)

DESCRIPTION AND MAIN OBJECTIVES

The Green, Smart and Integrated Transport and Logistics (GSITL) ensures a holistic understanding of different technology options and methods, cross-disciplinary abilities, the main necessary competences to develop, analyze and manage innovative and advanced sustainable systems for transportation and logistics

The specific objective of the Master Program is to train specialists with skills and abilities todevelop sustainable transport and logistics.

Learning outcomes:

- Knowledge and skills for international management of sustainable transport and logistics;
- Extensive knowledge of smart, green and integrated transport solutions as well aslogistics
- Skills in software technology applied in transport, data science, planning methods,operations research, assessment and management.
- Skills in research, technology management and leadership, pre-requisite for career progression in international sustainable transport industry.
- Professional, conceptual and detailed design of optimized, innovative, efficient andsustainable transport and logistic processes.
- Developing innovative solutions and products in relation to the requirements of international organizations by ensuring a high standard of quality and sustainable development in traffic management.

Career prospects:

- Environmental protection professional
- Sustainable transport specialist
- Smart transport planner
- Pollution engineer
- Environmental Analyst
- Logistics Management
- Logistics Development Specialist
- Transport Operations Manager
- Specialist in intelligent technologies for optimizing and reducing the impact of transport

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
1	1	Data analysis and statistics	2	0	1	0	4
1	1	Economic and Financial Analysis	1	0	1	0	3
1	1	Green technologies in transport systems	2	0	0	2	4
1	1	Organizational Behaviour, HR and Intercultural management	1	0	1	0	3
1	1	E-commerce and Transport Marketing	1	0	1	0	3
1	1	Intermodal transportation	1	0	0	2	3
1	1	Scientific research 1/Practical stage 1	12				10
1	2	Sustainable Transport and Logistics Management	2	0	0	1	4
1	2	Knowledge Management and Innovation in Transport Services	1	1	0	0	3
1	2	Project management	1	0	0	2	3
1	2	Quality-security-environment in transport services	2	1	0	1	4
Optional 1		Safety management systems	1	1	0	0	3
		Optimization in air transport	1	0	0	1	3
Optional 2		Road and Rail safety	1	1	0	0	3
		Sustainable Urban Transportation and mobility	1	0	0	1	3
1	2	Scientific research 2/Practical stage 2	12				10
2	3	Regulatory policies and Transport Law	1	0	1	0	3
2	3	Strategic management in Transport	1	0	1	0	3
Optional 1		Aviation and environment	2	1	0	1	4
		Sustainable management and infrastructure of airports	2	1	0	1	4
		Air transport operations	1	1	0	0	3
		ICT in Air Transport	1	1	0	0	3
Optional 2		Transportation and Land-Use Integration	1	0	1	0	3
		Green vehicles	2	0	2	0	4
		Advanced Operations in Terminals	1	0	0	2	3
		Intelligent Transport Systems and ICT	2	0	1	0	4
2	3	Scientific research 3/Practical stage 3	12				10
2	4	Practical work, scientific Research (Master Thesis preparation)				27	28
2	4	Ethics	1				2

OTHER INFORMATION

WEBSITE:	https://upb.ro/catedra-unesco/
CONTACT PERSON:	Univ. Prof. Sorin Eugen ZAHARIA

Transport Management (taught in English)

FACULTY: Faculty of Transport – Transport, Traffic and Logistics Department

DESCRIPTION AND MAIN OBJECTIVES

Since transportation is so correlated with many aspects of life and society, the master of Transport Management has a multi-disciplinary take on transportation including technological, infrastructural, economic, social, urban, environmental, and psychological aspects. Students approach the transportation challenges from different perspectives,integrating knowledge and skills from different domains, from transport planning and sustainable policy, traffic management to strategic projects analysis, behavioural intervention,and human resources.

Learning outcomes:

- Promoting the requirements of sustainable development in the development of transport systems.
- Complex and systemic treatment, considering all transport demands/needs, existing and planned infrastructures and equipment, new means of transport and technologies.
- Coordinating actions of mitigation among spatial planning, urban planning, and transport in the development/modernization/restructuring projects.
- Holistic treatment of technical infrastructures in spatial planning/urbanism and overcoming sectoral visions.
- Evaluating the performances of a transport system as well as those of its components (means of transport, infrastructures, machines, and equipment for loading / unloading, information / information systems).
- Implementation of modern modal, multimodal and intermodal transport technologies,which ensure the rational/optimal use of the available resources with minimum externalities.
- The assimilation of technological progress, including that attributed to information technology, to increase the quality, safety, and security of transport.

Career prospects:

- Transport company manager
- Supply chain manager
- Urban transit system manager
- Transport infrastructure development consultant
- Traffic planner
- Environmental protection professional

CURRICULA

			Weekly number of hours	

Year	Semester	Subject name	Lecture	Tutorial	Labwork	Project	ECTS
1	1	Statistics	2	0	2	0	5
1	1	Project Management in Transportation	2	0	2	0	5
1	1	Advanced Transport Economics	2	0	2	0	5
1	1	Tactical and Operational Management I	2	0	2	0	5
1	1	Scientific and Applied Research I	12				10
1st Semester							30
1	2	Tactical and Operational Management II	2	0	0	0	3
1	2	Tactical and Operational Management III (P)	0	0	0	2	3
1	2	Management Information Systems	2	0	2	0	5
1	2	Strategic Management in Transportation I	2	0	0	0	3
1	2	Strategic Management in Transportation II (P)	0	0	0	2	2
1	2	Energy Management in Transportation	2	0	2	0	4
1	2	Scientific and Applicative Research II	12				10
2nd Semester							30
2	3	Supply Chain Management	2	0	2	0	5
2	3	Human Resources Management	1	0	2	0	4
2	3	Decision-Making Modeling in Transportation	2	0	1	0	4
2	3	Transport Quality	2	0	1	0	4
		International Transport and Forwarding	1	0	2	2	3
2	3	Scientific and applicative research III	12				10
3rd Semester							30
2	4	Ethics and Academic Integrity	1	0	0	0	2
2	4	Scientific research, practical research, and dissertation elaboration	0	0	0	27	28

OTHER INFORMATION

Erasmus agreements with European universities – students and professors exchanges in thefield of Transport Management.

Institutional agreements with professional associations and companies in transport and logistics (e.g. Romanian Association of Logistics, Romanian Forwarders Union, RomanianRoad Authority)

WEBSITE:	http://ingtrans.pub.ro/en/
CONTACT PERSON:	Professor Mihaela POPA Professor Eugen Roșca

DOMAIN: ELECTRICAL ENGINEERING

Bachelor programs

Electrical Engineering and Computers

FACULTY: Electrical Engineering

DESCRIPTION AND MAIN OBJECTIVES

The "Electrical and Computer Engineering" degree programme is in line with the teaching mission to prepare graduates with a bachelor's degree who have a basic background in electrical engineering, specific knowledge of industrial hardware and software applications in the field, as well as the basic knowledge to initiate research activities.
The study programme is in line with the policy of POLITEHNICA University of Bucharest and the Faculty of Electrical Engineering, through the curriculum developed and the entire training of students within it, with the following main objectives:

- ensuring a high quality of training of students in the field through a teaching staff made up of teachers (in the vast majority) with doctoral degrees, through the efficient organization of the teaching process, through the quality and modernization of the laboratories where students work and through the study conditions created;
- maintaining a high level of knowledge acquired by students so that they can meet the most demanding requirements of the labour market.

The curriculum developed for the study programme "Electrical and Computer Engineering" is in line with the curricula of the same specialisation in European universities and will provide graduates with the necessary skills to easily find a job.
The curriculum developed for this specialization will provide students with a coherent professional training with a broad spectrum of knowledge by harmoniously combining the study of fundamental disciplines, engineering disciplines and specialized disciplines, in accordance with the policy of the University POLITEHNICA of Bucharest and the Faculty of Electrical Engineering. As a result, students will have at the end of the 4 years of study both general cognitive skills, as well as specialist skills and abilities to the specialization, Electrical and Computer Engineering".

CURRICULA

Year	Sem	Subject name	Weekly number of hours				ECTS
			Lecture	Tutorial	Labwork	Project	
First Year Compulsory subjects							
1	1	Linear algebra, analytical and differential geometry	3	2	-	-	6
1	1	Calculus	3	2	-	-	6
1	1	Chemistry	2	-	1	-	3

1	1	Computer aided graphics	2	1	1	-	4
1	1	Computers programming and programming languages I	2	-	2	-	4
1	1	Physical education and sport	-	2	-	-	3
1	1	Foreign language I	2	1	-	-	4
1	2	Special mathematics	3	2	-	-	6
1	2	Physics	3	2	1	-	6
1	2	Fundamentals of electrotechnics	3	2	1	-	6
1	2	Computers programming and programming languages II	2	-	2	-	5
1	2	Physical education and sport II	-	2	-	-	3
1	2	Foreign language II	2	1	-	-	4
1	1	Psyhology of education (optional)	2	2			5
1	2	Pedagogy I (optional)	2	2			5
2	1	Computer architecture	2	-	1	-	4
2	1	Digital systems	2	-	2	-	4
2	1	Electrical circuit theory	3	1	1	-	6
2	1	Electronics I	2	1	1	-	4
2	1	Numerical methods	2	-	2	-	5
2	1	Database	2	-	2	-	4
2	1	Computer interfaces and peripherals (optional)	2	1			3
2	1	Data transmissions and protocols (optional)	2	1			3
2	2	Signal theory and automatic adjustment	2	-	1	-	6
2	2	CAD for electrical engineering	2	-	1	1	6
2	2	Electrical circuits simulation	2	-	2	-	3
2	2	Electronics II	2	1	1	-	3

2	2	Electromagnetic field theory	3	1	1	1	6
2	2	Electrical and electronic measurements	3	-	2	-	6
3	1	Electric equipment	3	-	2	1	6
3	1	Static power converters	2	-	1	-	4
3	1	Electrical motors	3	-	2	1	6
3	1	Computer networks	1	-	1	-	3
3	1	Electrotechnical materials	3	-	2	-	6
3	1	Finite element method in electrical engineering (optional)	2	-	1	-	3
3	2	Numerical modeling of the electromagnetic field (optional)	2	-	1	-	3
3	2	Object oriented programming	2	-	2	-	3
3	2	Numerical signal processing	2	-	2	1	4
3	2	Electric drives	3	-	2	1	5
3	2	Programmable logic controllers	2	-	2	-	3
3	2	Microprocessor systems	2	1	1	-	4
3	2	Advanced production systems	2	-	1	-	3
3	2	Internship	360 hours in total				8
3	1	Computer aided training	1	-	1	-	2
3	1	Pedagogical practice in pre-university education system(1)	-	-	3	-	3
3	2	Pedagogical practice in pre-university education system(2)	-	-	3	-	3
3	2	Student class management	1	1	-	-	2
3	2	Graduation exam	-	-	-	-	5
4	1	Energy sources	2	1	1	-	5
4	1	Virtual instrumentation in electrical engineering (optional)	2	2	-	-	4
4	1	Monitoring and diagnosis of electrical equipment (optional)	2	2	-	-	4
4	1	Electrical installations	2	-	2	-	4
4	1	Optimization techniques in electrical engineering	2	-	1	1	4
4	1	Robotics (optional)	1	1	1	-	4

4	1	Electricity quality (optional)					4
4	1	Soft architectures and programming on integrated systems II (optional)	2	-	1	-	4
4	2	Quality and reliability	2	-	2	-	4
4	2	Electromagnetic compatibility	2	-	2	-	4
4	2	Electric and electronic equipment for vehicles	2	-	1	-	4
4	2	Neural networks (optional)	2	-	2	1	5
4	2	Artificial intelligence (optional)					
4	2	Management	2	-	-	1	3
4	2	Production, transmission and distribution of electricity	2	1	1	-	4
4	2	Elaboration of licence project	56 hours				4
4	2	License project stage	60 hours				2

OTHER INFORMATION

WEBSITE:	http://www.electro.upb.ro/en/home-english/
CONTACT PERSON:	Phd Prof Octavian Ghita

Master programs

Integrated electrical systems engineering in vehicles (taught in English)

FACULTY: Electrical Engineering

DESCRIPTION AND MAIN OBJECTIVES

The master program Integrated electrical systems engineering in vehicles is organized and coordinated by the Electrical Engineering Faculty from the University POLITEHNICA of Bucharest (UPB), with support and participation of the following faculties from UPB: Faculty of Transportation and Faculty of Automatic Control and Computer Science.
The main purpose of the program is to specialize students at a high scientific and technological level, through the formation of competences according to the current requirements of employers in the field of automotive industry, especially the main industrial partner of the program, Renault Romania Group.
The specific objectives of the program are:

- Assimilation of the specific aspects in the field of electrical systems integrated in vehicles (techniques, technologies, methods, algorithms, concepts, modeling, simulation, optimization, etc.);
- Knowledge and use of the hardware tools (equipment for measurements and testing) and the software packages (for programming, modeling, simulation, design, component optimization, systems and project management) from field of electrical systems integrated in vehicles.

CURRICULA

			Weekly number of hours	

Year	Sem	Subject name	Lecture	Tutorial	Labwork	Project	ECTS
1	1	Development and Management of Object Oriented Software Projects	2	0	2	0	4
1	1	Power Electronics Structures and Controls	2	0	2	0	4
1	1	Systems Engineering Management	2	0	1	0	4
1	1	Electromagnetic Compatibility in Distributed Systems	2	0	1	0	4
1	1	Vehicle Dynamics and Mechanics	2	0	1	0	4
1	1	Research/Practice 1	0	0	0	0	10
1	2	Interconnecting Devices and Interfaces	2	0	2	0	5
1	2	Sensors and Transducers for Vehicles	2	0	2	0	5
1	2	Electric Propulsion Systems for Vehicles	2	0	2	0	5
1	2	Vehicle Architecture	1	0	2	0	5
1	2	Research/Practice 2	0	0	0	0	10
2	3	Security and Functional Safety of Vehicle Electrical Systems	1	0	1	0	4
2	3	Numerical Simulation of Embedded Systems	2	0	2	0	4
2	3	Modeling, Simulation, Programming and Testing of Integrated Electromechanical Systems	2	0	2	0	4
2	3	Materials, Specific Technologies and Vehicles Environment Impact	2	0	1	0	4
2	3	Integrated Data Acquisition Systems	1	0	2	0	4
2	3	Research/Practice 3	0	0	0	0	10
2	4	Research/Practice for the Dissertation	0	0	0	0	28
2	4	Ethics	1	0	0	0	2

OTHER INFORMATION

We have a strong partnership with Renault Technologie Roumaine, „VALAHIA" University of Târgoviște, Technical University of Cluj-Napoca. Similar master programs are organizedin the two universities.

We encourage our master students to develop master thesis with industrial partners, especiallyRenault Technologie Roumaine and its related companies from automotive domain.

All courses of the program are open for Erasmus incoming students.

WEBSITE:	http://www.electro.pub.ro/master/planuri-de-invatamant/
CONTACT PERSON:	Mr. Mihai Iulian REBICAN

DOMAIN: MECHANICAL ENGINEERING

Bachelor programs

Mechanical Engineering (taught in English)

FACULTY: Engineering in Foreign Languages

DESCRIPTION AND MAIN OBJECTIVES

The bachelor program in Mechanical Engineering targets students attracted to the various application fields of Mechanics: fluid mechanics, power engineering (heat engines, turbines, air conditioning, etc.), environmental engineering, structural mechanics, mechanics of materials, robotics etc.
The training covers a broad and multidisciplinary spectrum in the field of mechanical engineering, which allows graduate engineers to access different jobs in a company: design, production, maintenance, quality, safety.

CURRICULA

Year	Sem	Subject name	Weekly number of hours				Practice	ECTS
			Lecture	Tutorial	Labwork	Project		
First Year Compulsory subjects								
1	1	Calculus I	3	2				6
1	1	Linear Algebra	2	2				4
1	1	Engineering Graphics I	1		2			4
1	1	Chemistry	2	1				3
1	1	Materials Science I	2		1			4
1	1	Professional Communication		2				2
1	1	European Culture & Civilization I	1	1				2
1	2	Calculus II	3	2				6
1	2	Physics I	2	1	1			5
1	2	Mechanics I	2	1				3
1	2	Engineering Graphics II	2		2			4
1	2	Programming Languages	1		2			3
1	2	Materials Science II	2		1			3
Elective subjects (one subject must be chosen among the following)								

1	1	Applied Informatics	2		2			3
		Discrete Mathematics	2	2				3
1	1	Physical Education I			2			2
		Foreign Language b (French/ German/Spanish)		2				2
1	2	European Culture & Civilization II	1	1				2
		Ethics and Academic Integrity	1	1				2
1	2	Physical Education II			2			2
		Foreign Language b (French/ German/Spanish)		2				2
		Optional subjects						
1	1	English for Engineering Academic Study I	1	1				2
1	1	Romanian Language (for foreign students) I		2				2
1	1	Langue francaise pour ingenieurs I		2				2
1	1	Educational Psychology	2	2				5
1	2	English for Engineering Academic Study II	1	1				2
1	2	Romanian Language (for foreign students) II		2				2
1	2	Langue francaise pour ingenieurs II		2				2
1	2	Pedagogy 1	2	2				5
		Second Year Compulsory subjects						
2	1	Mathematics for Engineers I	2	2				5
2	1	Probabilities & Statistics	2	1				2
2	1	Physics II	2		1			4
2	1	Strength of Materials I	2	1	1			4
2	1	Introduction to Mechanical Engineering	1		2			4
2	1	Electrical engineering I	2	1				3
2	1	Mechanics II	2	1	1			4
2	1	Collaborative Work II		2				2
2	1	Microeconomics	1	1				2
2	2	Material Technology	2		1			3
2	2	Mechanics III	1	1				2
2	2	Strength of Materials II	2	1				3

2	2	Manufacturing Processes I	2		1			3
2	2	Machine Elements & Mechanisms I	2		1			4
2	2	Numerical Methods	2	2				5
2	2	Software Tools for Mechanical Engineering I (solid body design)	1		2			3
2	2	Technical writing		2				2
2	2	Macroeconomics	1	1				2
		Elective subjects						
2	2	Electrical engineering II (Electrical machines)	2	1				3
		Electrical measurements & Transducers	2	1				3
		Optional subjects						
2	1	Romanian Language (for foreign students) III		2				2
2	1	Pedagogy 2	2	2				5
2	2	Romanian Language (for foreign students) IV		2				2
2	2	Didactics of the specialization	2	2				5
		Third Year Compulsory subjects						
3	1	Finite Element Analysis	2		2			4
3	1	Engineering Thermodynamics	2	1	1			5
3	1	Fluid Mechanics	2	1				4
3	1	Machine Elements & Mechanisms II	2		1	2		5
3	1	Manufacturing Processes II	2		1			3
3	1	Design for recycling	2			2		3
3	1	Mechanical Behavior of Materials	2	1				4
3	1	Money & Banking	1	1				2
3	2	Heat & Mass Transfer	3	1	1			4
3	2	Dynamics of Machinery	2		2			3
3	2	Mechanical Transmissions	3		1			3
3	2	Computational Structural Mechanics	2	1	1			3
3	2	Mechanical Transmissions Project				2		2
3	2	Practical Workshop						4
3	2	Practical Workshop						4
3	2	Business Administration	1	1				2

		Elective Subjects						
3	2	Mechanical Measurements	2		1			2
		Electronic Devices & Circuits	2		1			2
3	2	Engineering analysis and control technics	2		2			3
		Applied Fluid Dynamics (Pumps,...)	2		2			3
		Fourth Year Compulsory subjects						
4	1	Software Tools for Mechanical Engineering II (thermal design)	2		2			4
4	1	Tribology	2		2			5
4	1	Design of Innovative Products	1			2		3
4	1	Nanotechnology applications in mechanical engineering	1			2		3
4	1	Heat Engines I (Internal Combustion Engines)	2		1	2		6
4	1	Fundamentals of management	1	1				2
4	2	Heat Engines II (Turbines & Steam Generators)	2		2			4
4	2	Refrigeration and Air Conditioning	2	1	2			5
4	2	Environmental Engineering	2	1				3
4	2	Diploma Project				8		4
4	2	Diploma Project Internship						6
4	2	Compressors and Fans	2			1		3
4	2	Fluid Power Systems	2		1			3
		Elective Subjects						
4	1	Electronics	2		1			4
		Control Theory	2		1			4
4	1	Advanced Manufacturing Processes and Quality Assurance	2		1			3
		Image Processing	2		1			3
4	2	Industrial Management	1	1				2
		Robotics & Virtual Reality	1		1			2

OTHER INFORMATION

All the lectures of the program are fully taught in English and they are open for Erasmus incoming students.

The program extends on 4 study years, each one having two semesters. A total of 240 compulsory ECTS are required to graduate the program.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mrs. Camelia STANCIU

Ingénierie Mécanique (enseigné en Français)

FACULTY	**Ingénierie en Langues Étrangères**

DESCRIPTION AND MAIN OBJECTIVES

La Licence en Ingénierie Mécanique s'adresse à des étudiants attirés par les Sciences de l'Ingénieur dans les différents domaines d'applications de la Mécanique, qu'il s'agisse de : la mécanique des fluides, l'énergétique (moteurs, turbines, conditionnement de l'air, etc.) et l'environnement, la mécanique des structures, la mécanique des matériaux, la robotique etc.
La formation couvre un spectre large et pluridisciplinaire dans le domaine de la mécanique ce qui permets aux ingénieurs diplômés d'accéder a toutes les fonctions d'une entreprise : bureaux d'études, de production, maintenance, qualité, sécurité. Ayant une orientation vers la conception, modélisation et simulation numérique en mécanique en couvrant à la fois la mécanique des solides, des fluides et l'énergétique le principal débouché demeure les carrières de l'ingénierie dans les bureaux d'études.
Le plan d'enseignement est conçu d'une manière à couvrir et assurer le développement des compétences fondamentales de base pour un ingénieur, des compétences complémentaires, linguistiques et de l'économie.

CURRICULA

Année d' étude	Sem	Sujet	Nombres des heures par semaine				Stage	ECTS
			Cours	TD	TP	Projet		
BAC+1 Sujets obligatoires								
1	1	Analyse I	2	2				4
1	1	Algèbre linéaire, géométrie analytique et différentielle	2	2				4
1	1	Graphique technique et infographie I	1		2			4
1	1	Chimie	2	1				4
1	1	Science et ingénierie des matériaux I	2		1			4
1	1	Communication I	1	1				2
1	1	Techniques et systèmes de travail collaboratif I		2				2
1	1	Éducation physique et sport I			1			1
1	2	Analyse II	2	2				5
1	2	Physique I	2	1	1			4
1	2	Mécanique I	2	1				3
1	2	Graphique technique et infographie II	2		2			4
1	2	Science et ingénierie des matériaux II	2		1			4

1	2	Langages de programmation	2		2			3
1	2	Communication II	1	1				2
1	2	Techniques et systèmes de travail collaboratif II		2				2
1	2	Éducation physique et sport II			1			1
Sujets au choix (un sujet obligatoire parmi les deux)								
1	1	Informatique appliquée/ Probabilités et statistique mathématique	1		2			3
1	1	Langue Anglaise I / Langue Allemande I	1	1				2
1	2	Langue Anglaise II / Langue Allemande II		1				2
Sujets optionnelles								
1	1	Langue Roumaine (pour étudiants étrangères) I		2				2
1	1	English for Engineering Academic Study I	1	1				2
1	1	Langue française pour ingénieurs I		2				2
1	1	Psychologie de l'éducation	2	2				5
1	2	Langue Roumaine (pour étudiants étrangères) II		2				2
1	2	English for Engineering Academic Study II	1	1				2
1	2	Langue française pour ingénieurs I		2				2
1	2	Pedagogie 1	2	2				5
BAC+2 Sujets obligatoires								
2	1	Mathématiques pour ingénieurs I	2	2				4
2	1	Physique II	2		1			4
2	1	Resistance des matériaux I	2	2				4
2	1	Conception assiste par ordinateur	2		2			5
2	1	Electrotechnique	2	1				3
2	1	Mécanique II	2	1				3
2	1	Traitement des documents techniques I		2				2
2	1	Éducation physique et sport III			1			1
2	1	Microéconomie	1	1				2
2	2	Mathématiques pour ingénieurs II	2	2				4
2	2	Resistance des matériaux II	2	1				4
2	2	Procédés de fabrication I	2		1			4
2	2	Éléments des machines I	2		1			4
2	2	Méthodes numériques	2		2			3
2	2	Logiciels de génie mécanique I (conception corps solides)	2		1			3
2	2	Traitement des documents techniques II		2				2
2	2	Macroéconomie	1	1				2
Sujets au choix (un sujet obligatoire parmi les deux)								

2	1	Langue Anglaise III / Langue Allemande III		1				2
2	2	Langue Anglaise IV / Langue Allemande IV			1			1
2	2	Machines électriques/ Tolérance et contrôle dimensionnel	2		1			3
		Sujets optionnelles						
2	1	Langue Roumaine (pour étudiants étrangères) III		2				2
2	1	Pedagogie 2	2	2				5
2	2	Langue Roumaine (pour étudiants étrangères) IV		2				2
2	2	Didactique de la spécialité	2	2				5
		BAC+3 Sujets obligatoires						
3	1	Analyse par éléments finis	2		2			4
3	1	Thermodynamique technique	2	1	1			5
3	1	Mécanique des fluides	2	1				4
3	1	Systèmes de réglage automatique	2		1			4
3	1	Éléments des machines II	2		1	2		5
3	1	Procédés de fabrication II	2		1			3
3	1	Mécanique III	1	1				2
3	2	Transfert de chaleur et de masse	3	1	1			3
3	2	Dynamique des machines	2		2			3
3	2	Éléments des machines III (Transmissions mécaniques)	3		1			3
3	2	Mécanique des fluides et machines hydrauliques (pompes,...)	2		2			3
3	2	Mécanique structurelle	2	1	1			3
3	2	Éléments des machines III (projet de transmissions mécaniques)				2		2
3	2	Stage industriel en domaine						4
3	2	Stage industriel de spécialité						4
3	2	Management (Fondements du management)	1	1				2
		Sujets au choix (un sujet obligatoire parmi les deux)						
3	1	Resistance des matériaux III (Mécanique appliquée des matériaux) / Technologies des matériaux	2		1			3
3	2	Mesures mécaniques/ Systèmes d'acquisitions et interfaces	2		1			3
		Sujets optionnelles						
3	1	Administration des affaires	1	1				2
		BAC+4 Sujets obligatoires						
4	1	Logiciels de génie mécanique II (conception thermique)	2		2			5
4	1	Tribologie	2		2			4
4	1	Conception des produits innovants	2			2		4

4	1	Asservissement hydraulique et pneumatiques	2		1			4
4	1	Électronique appliquée	2		1			4
4	1	Machines thermiques I (Moteurs à combustion interne)	2	1	1	1		6
4	2	Machines thermiques II (Turbines et Générateurs de vapeurs)	2	1	2			5
4	2	Réfrigération et conditionnement de l'air	2	1	2			5
4	2	Projet de fin d'études				8		4
4	2	Stage pour projet fin d'étude (60h)						6
4	2	Compresseurs et ventilateurs	2			1		3
Sujets au choix (un sujet obligatoire parmi les deux)								
4	1	Assurance de la qualité/ Management des projets industriels	2		1			3
4	2	Éco-conception/ Énergie renouvelables (solaire thermique)	2			1		3
4	2	Génie de l'environnement/ Optimisation en génie mécanique	2	1				4

OTHER INFORMATION

Tous les sujets du programme sont enseignés en Français et ils sont ouvertes aux étudiants Erasmus, sauf le stage pratique qui se déroule pendant l'été.
Le programme se déroule sur une période de 4 années, chacune ayant 2 semestres. Il faut avoir 240 ECTS obligatoires pour obtenir son diplôme.

WEBSITE:	http://ing.pub.ro/en/education/licence/
CONTACT PERSON:	Mme. Camelia STANCIU

Master programs

Integrated Mechanical Engineering Design (taught in English)

FACULTY: Mechanical Engineering and Mechatronics

DESCRIPTION AND MAIN OBJECTIVES

Integrated Mechanical Engineering Design (IMED) is the only master's degree program in Romania in the field of Mechanical Engineering taught in English.

The overall objective of the program is to provide future graduates with the theoretical foundations, skills and abilities needed to use modern integrated CAD methods to design mechanical engineering products in the light of future developments towards the fourthindustrial revolution (Industry 4.0). Thus, through the acquired skills and abilities, graduates will be able to design advanced mechanical components and systems, build their physical model to analyze and study them experimentally and create a virtual model to simulate their behavior using modern software applications (CATIA, Autodesk

Inventor and Nastran, SolidWorks, Ansys and Fluent). They will also be able to select the most suitable materials and technologies (including additive manufacturing technologies - 3D printing) for the development of the studied mechanical products/systems, evaluate their reliability and find innovative solutions for their optimization.

All of these are done using as teaching language the most widely used international language in multinational companies, English. Thus, the graduates of this master's program have better opportunities to find well paid jobs in Romania (examples of companies: Renault Technologie Roumanie, Dacia, SKF, Holcim, Segula Technologies, AKKA Technologies, Expleo Group, Bertrandt Engineering Technologies, eXcent Defi etc.), as well as in the European Union.

CURRICULA

Year	Sem	Subject name	Weekly number of hours					ECTS
			Lecture	Tutorial	Labwork	Project	Reseaearch	
Compulsory subjects								
1	1	Modelling and Simulation in Mechanical Engineering I	2		2			4
1	1	Numerical Simulation of Heat and Mass Transfer	2		2			5
1	1	Finite Element Method	1		1			3
1	1	Surfaces and Contacts	2		2			5
1	1	Scientific and Practical Research I					12	10
Optional subjects								
1	1	Special Chapters of Fluid Mechanics Manufacturing Technology and Management	1		1			3
Compulsory subjects								
1	2	Advanced Calculus of Structures	2		2			5
1	2	Modelling and Simulation in Mechanical Engineering II	2		2			4
1	2	Virtual Prototype for Product Development	1		2			4
1	2	Product Development I	2	1				4
1	2	Scientific and Practical Research II					12	10
Optional subjects								
1	2	Materials and Structures Design and Visual Impact	1		1			3
Compulsory subjects								
2	3	Reliability of Complex Products	2	2				4
2	3	Mechanical Design of Renewable Energy Systems	2	1	1			4
2	3	Computer Aided Design of Plastic Components	2		2			4

2	3	Product Development II	1	1				3
2	3	Ethics and Academic Integrity	1					2

OTHER INFORMATION

This program welcomes incoming Erasmus+ students for one semester or an entire year.

The master's program will offer new opportunities to students interested in study mobilities within the European inter-university cooperation programs (Erasmus+, Athens, CEEPUS,etc.).

Based on our active partnerships, students will have the possibility to develop their master thesis in collaboration with research centers (Romanian Research & Development Institute for Gas Turbines COMOTI; Hydraulics and Pneumatics Research Institute INOE 2000-IHP; INCAS - National Institute for Aerospace Research "Elie Carafoli" etc.) and various industry companies.

WEBSITE:	https://masterupb.wixsite.com/imed http://www.mecanica.pub.ro/new/index.php/programe-master/
CONTACT PERSON:	Mr. Nicolae-Alexandru STOICA

DOMAIN: APPLIED ENGINEERING SCIENCES

Bachelor programs

Master programs

Smart Biomaterials and Applications (taught in English)

FACULTY: Medical Engineering

DESCRIPTION AND MAIN OBJECTIVES

The master program Smart Biomaterials and Applications is organized and coordinated by theFaculty of Medical Engineering from the University POLITEHNICA of Bucharest (UPB).

The main purpose of the program is to provide competitive education using state-of-the-art laboratories and highly skilled trainers for the tomorrow's specialists and leaders in the fieldof Biomaterials and Applications. This program aims the development of real employability skills according to the current requirements of employers in modern fabrication technologies, implants, tissue engineering and medical engineering.

The specific objectives of the program are:

a. Assimilation of solid technical knowledge, verbal and written communication, decision making, lateral thinking, analytical thinking, investigating, in the field of modern and smart biomaterials (advanced materials – biomimetic, smart; artificial organs; bio functionalization; surface engineering; control of properties; (bio)fabrication technologies – 3D (bio)printing, electrospinning; advanced characterization methods – micro-CT, biodynamic testing, biosensors, algorithms, concepts, modeling, simulation, optimization, etc.);

b. Knowledge and use of modern hardware tools (fabrication technologies: 3D (bio)printing, electrospinning, extrusion, plasma treatment; advanced characterization / testing including: contact angle and superficial tension, circular dichroism, micro-CT, electron microscopy, FTIR, Raman, UV-Vis spectroscopy) and corresponding software packages (for programming, modeling, design, image analysis) from the field of smart biomaterials and applications.

CURRICULA

Year	Sem	Subject name	Weekly number of hours					ECTS
			Lecture	Tutorial	Labwork	Project	Research	

1	1	Smart biomaterials	2	0	1	0	0	4
1	1	Smart and biomimetic biomaterials	2	0	2	0	0	4
1	1	Active nano-biostructured surfaces and interfaces engineering	2	0	2	0	0	4
1	1	Settings of biomaterials	2	0	1	0	0	4
1	1	Dental cements	2	0	1	0	0	4
1	1	Scientific Research/Practice 1	0	0	0	0	12	10
1	2	Artificial tissues and organs	2	0	1	0	0	3
1	2	Radiation interactions with nano-biomaterials and living tissue	2	0	1	0	0	4
1	2	Advanced technologies for biomaterials processing	2	0	1	0	0	4
1	2	Advanced technologies for biomaterials processing	2	0	0	0	0	3
1	2	Carbon-based polymeric biomaterials for bioengineering	2	0	1	0	0	3
1	2	Tissue regeneration engineering with stem cells	2	0	0	0	0	3
1	2	Scientific Research/Practice 2	0	0	0	0	12	10
2	3	Advanced bio ceramics	1	0	3	0	0	5
2	3	Protein engineering	1	0	2	0	0	5
2	3	(Bio)Functionalized polymers-scaffolds for regenerative and personalized medicine	2	0	1	2	0	5
2	3	Medical analyses and evaluation advanced techniques	1	0	2	0	0	5
2	3	Scientific Research/Practice 3	0	0	0	0	12	10
2	4	Research/Practice for the Dissertation	0	0	0	0	27	28
2	4	Ethics	1	0	0	0	0	2

OTHER INFORMATION

We have a strong partnership with the University of Medicine and Pharmacy Carol Davila, Bucharest and we promote partnership with different universities and research groups in Europe. We encourage the master students to develop master theses with research, industrialor clinical partners. The master students will be part of a research team to fully experience what means to be a researcher. All the courses of the program are open for Erasmus incoming students.

WEBSITE:	https://fim.upb.ro/smart-biomaterials-and-applications-smart/
CONTACT PERSON:	Mrs. Izabela-Cristina STANCU

DOMAIN: SCIENCES DE LA COMMUNICATION

Bachelor programs

Master programs

Technologies de la langue et de la traduction automatique (Enseigné en Français)

FACULTY: Faculté d'Ingénierie en Langues Étrangères

DESCRIPTION AND MAIN OBJECTIVES

Le Master Technologies de la langue et de la traduction automatique a été mis en place en 2008 et fonctionne depuis en partenariat avec l'Université Grenoble Alpes, de France. Il répond aux besoins actuels de développement des technologies utilisées dans le traitement de la langue (logiciels de traduction et d'analyse textuelle, algorithmes, mémoires de traduction, création de corpus) mais aussi aux besoins de formation de traducteurs spécialisés. La formation offre aux étudiants les connaissances informatiques et linguistiques, leur permettant de maîtriser tant la création et la gestion d'outils informatiques que les mécanismes de fonctionnement de la langue. Le Master Technologies de la langue et de la traduction offre une formation de pointe dans le domaine interdisciplinaire de l'ingénierie linguistique. La formation apporte aux étudiants des connaissances en matière de compréhension et de génération de textes, pour qu'ils soient à même de représenter les données linguistiques dans des formalismes opératoires et de les implémenter à l'aide de programmes.

Objectifs principaux:

- développement et renforcement des connaissances informatiques ; développement des connaissances linguistiques et des connaissances en langues de spécialité ; création de savoirs spécifiques dans le domaine des technologies de la langue;
- apporter une formation informatique renforcée, adaptée aux besoins de la traduction à travers les notions d'algo-programmation, nécessaires à l'élaboration et/ou exploitation des différents outils du domaine;
- fournir aux étudiants les concepts nécessaires à l'analyse de l'objet langue, leur permettant d'effectuer une analyse profonde du texte d'entrée, intégrant les composantes syntaxiques, sémantiques et pragmatiques avant de procéder au transfert dans la langue cible;
- assurer le perfectionnement linguistique en français et l'assimilation de stratégies et de techniques de traduction.

Points forts:

- l'enseignement du master est dispensé totalement en français;
- équipe pédagogique mixte roumano-français ;
- des mobilités Erasmus qui fonctionnent tous les ans;

- double compétence à l'issue du master : maîtrise des langues (français, anglais, espagnol) et maîtrise des technologies en TAL;
- soutenu par l'Ambassade de France à Bucarest.

Débouchés:

- ingénieur linguiste habileté à travailler dans la conception, réalisation, exploitation et maintenance de logiciels de traitement de texte et de traduction;
- traducteur spécialisé dans différents domaines techniques et/ou scientifiques, dans le multimédia (localisation de logiciels, sous-titrage, création de sites Web multilingues, traduction de sites Web);
- terminologue, rédacteur de documents techniques en langues étrangères, rédacteur- correcteur.

CURRICULA

Année	Semestre	Discipline	Nb. H/sem	Crédits
1	1	Bases du TAL (traitement automatique de la langue)	4	5
1	1	Logiciels pour la traduction automatique I	2	4
1	1	Théories linguistiques dans le TA	4	5
1	1	Perfectionnement linguistique en français I	2	3
1	1	Développement de compétences avancées de communication technique et scientifique en anglais	2	3
1	1	Recherche scientifique	12	10
1	2	Algo -programmation	4	5
1	2	Modélisation linguistique	2	4
1	2	Modèles sémantiques et traductologie	4	5
1	2	Langue espagnole I	2	3
1	2	Communication écrite scientifique et technique en anglais	2	3
1	2	Recherche scientifique	12	10
2	1	Méthodes avancées en TAL	4	5
2	1	Élaboration structuration de corpus	4	5
2	1	Langue espagnole II	2	3
2	1	Logiciels pour le TAL II	2	4
2	1	Perfectionnement linguistique en français II	2	3
2	1	Recherche et stage pratique	12	10
2	2	Logiciels pour le TAL III	2	4
2	2	Analyse textuelle et des corpus	4	5
2	2	Création de ressources linguistiques multilingues	2	3

OTHER INFORMATION

Etudiants Erasmus, partenariat avec les entreprises, possibilité dedévelopper la thèse de fin d'études à Grenoble ou en partenariat avec l'industrie.

WEBSITE:	http://ing.pub.ro/admitere-technologies-de-la-langue-et-de-la-traduction-automatique/
CONTACT PERSON:	Mme. Roxana Anca TROFIN