



DIPARTIMENTO DI INGEGNERIA DELL'ENERGIA ELETTRICA
E DELL'INFORMAZIONE "GUGLIELMO MARCONI"

Master's Degree
ELECTRONIC ENGINEERING

Director: Prof. Cecilia Metra

Master's Degree in Electronic Engineering New curriculum E-BIT – Electronic technologies for Big-data and Internet of things

For the academic year 2017/2018, the international curriculum of Electronic Engineering has been completely redesigned and has been named Electronic technologies for Big-data and Internet of things (E-BIT).

Students of E-BIT will attain deep knowledge in electronic technologies related to the development and design of electronic devices, solid-state sensors, circuits and systems employed for acquisition, reliable storage and processing of the big data generated by Internet-of-Things applications. Several other challenges related to these issues, such as security, wireless sensor networks, automation systems, advanced computer architecture etc. will be addressed in elective courses. A class taught by experts from leading Companies or Institutions will also be offered, thus enabling students to acquire an industrial perspective of the challenges and best practices in the field.

Career opportunities

E-BIT graduates will be fully qualified to work in national and international companies whose core business is the design and development of electronic devices, circuits, systems and infrastructures for big data acquisition, storage and processing from and for Internet-of-Things applications. Moreover, they will possess the general skills needed to contribute effectively to all working activities employing electronic technologies and infrastructures, for an even larger variety of electronic applications, within public or private research Institutes, public Agencies, Academia. Their responsibilities will range from design to research, development, management and teaching.

Learning activities

E-BIT is a 120 credits, four-semester programme, consisting in core classes (57 credits), curriculum classes (18 credits), elective classes (12 credits), general-culture classes (12 credits) and a Master thesis (21 credits). The core classes are mainly concentrated in the first year and aim at consolidating basic knowledge. During their second year, students can choose their curriculum classes mostly in the field of electronics and telecommunications with options in automation and robotics, computers and information processing, bioengineering. The classes are organized with lectures, practice, design and laboratory activities.

The course structure has been already defined and you can see all the exams in the table down below. However, the full syllabus will be available in the next few months as some exam contents remain to be filled.



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Program structure and exams

	First year	ECTS credits	Course type
1) Mandatory courses			
84418	ADVANCED SOLID-STATE SENSORS M	6	B
84452	ANALOG CIRCUITS, SENSOR READOUT AND CONVERSION M	12	B
84454	DESIGN FOR RELIABLE DATA PROCESSING AND STORAGE M	6	B
84450	DIGITAL SYSTEMS AND INTRODUCTION TO COMPUTER ARCHITECTURES M (integrated exam)	12	
84447	INTRODUCTION TO COMPUTER ARCHITECTURES M (first part)	6	C
73388	DIGITAL SYSTEMS M (second part)	6	B
29161	MATHEMATICAL METHODS M	6	C
84200	PHYSICS OF SEMICONDUCTOR DEVICES AND MEMORIES M	6	B
2) Elective courses (F-type) – Choose 6 credits			
84455	LAB OF ANALOG ELECTRONICS AND INSTRUMENTATION M	3	F
84419	LAB OF DIGITAL ELECTRONICS M	3	F
73015	LAB OF RELIABLE SYSTEMS DESIGN M	3	F
	Second year	ECTS	Course type
1) Mandatory courses			
30800	FINAL PROJECT	21	E
35152	HARDWARE-SOFTWARE DESIGN OF EMBEDDED SYSTEMS M	6	B
84457	SIGNAL ACQUISITION AND PROCESSING M	6	B



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84423	STATISTICS AND ARCHITECTURES FOR BIG DATA PROCESSING M	9	B
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2) Elective courses (C-type – choose 6 credits)

72996	COMPUTER ARCHITECTURES M	6	C
84228	INDUSTRIAL ROBOTICS M	6	C
81652	INTEROPERABILITY OF EMBEDDED SYSTEMS M	6	C
69441	OPTIMIZATION MODELS AND ALGORITHMS M	6	C
35190	WIRELESS SENSOR NETWORKS M	6	C

3) Elective courses (F-type – choose 6 credits)

72972	LAB OF HIGH-FREQUENCY CIRCUIT DESIGN M	3	F
72967	LAB OF STATISTICAL SIGNAL PROCESSING M	3	F
37700	PRELIMINARY FINAL PROJECT WORK M	3	F

4) Courses freely chosen by the student (choose 12 credits)

78453	ELECTRIC POWER SYSTEMS AND SMART GRIDS M	6	B
84465	EMBEDDED SYSTEMS: DESIGN AND APPLICATIONS M	6	D
84442	HIGH FREQUENCY ELECTRONIC CIRCUITS M	6	B
84468	INDUSTRIAL TRENDS IN ELECTRONICS M	6	D
73924	POWER ELECTRONIC CIRCUITS M	6	D
84462	SECURE SYSTEMS M	6	D