



# Electronics and Communications Engineering

## Curriculum: Electronics for Smart Industry

STUDY PLANS*		
EDUCATIONAL PROGRAM A	EDUCATIONAL PROGRAM B	CFU
<b>FIRST YEAR – FIRST SEMESTER</b>		
Electric System & Green Power Devices	Electric System & Green Power Devices	6
Digital Communications	Digital Communications	9
Statistical Signal Processing	Statistical Signal Processing	6
<i>One class among the following (free choice):</i>		
Analog Circuit Design	Analog Circuit Design	6
Networking**	Networking**	6
<b>FIRST YEAR – SECOND SEMESTER</b>		
Digital Embedded Electronics for Smart Industry	Digital Embedded Electronics for Smart Industry	9
Industrial Reliability & Safety Engineering	Industrial Reliability & Safety Engineering	6
Mathematical Methods for Engineering	Mathematical Methods for Engineering	6
	Sensors & Microsystems	6
<i>ONE class among the following (free choice):</i>		
Microwave Engineering		9
Modern Communication Technologies for 5G & Beyond		9
	<i>ONE class among the following (free choice):</i>	
	Computational Electromagnetics**	6
	Cybersecurity**	6
	Mobile Communications & IoT**	6
<b>SECOND YEAR – FIRST SEMESTER</b>		
Antennas & Propagation	Antennas & Propagation	9
Information Theory	Information Theory	6
	Advanced Digital Image Processing	9
<i>TWO classes among the following (free choice):</i>		
Advanced Computer Architectures	Advanced Computer Architectures	6
Digital Modelling, Design & Manufacturing	Digital Modelling, Design & Manufacturing	6
RFID Technologies**	RFID Technologies**	6
<b>SECOND YEAR – SECOND SEMESTER</b>		
Sensors & Microsystems		6
Internship	Internship	9
Master Thesis	Master Thesis	21

\* Among the free choices, it is possible to choose other classes taught at the University of Siena, up to a maximum of 12 CFUs, if they are coherent with the course aims and pursuant to the academic regulations.

\*\* At least one of the double-starred classes must be included in the study plan.



# Electronics and Communications Engineering

## Curriculum: Telecommunications for the Digital Society

STUDY PLANS*		
EDUCATIONAL PROGRAM A	EDUCATIONAL PROGRAM B	CFU
<b>FIRST YEAR – FIRST SEMESTER</b>		
Analog Circuit Design	Analog Circuit Design	6
Digital Communications	Digital Communications	9
Networking	Networking	6
Statistical Signal Processing	Statistical Signal Processing	6
<b>FIRST YEAR – SECOND SEMESTER</b>		
Mathematical Methods for Engineering	Mathematical Methods for Engineering	6
Microwave Engineering		9
Modern Communication Technologies for 5G & Beyond		9
	<i>ONE class among the following (free choice):</i>	
	Microwave Engineering	9
	Modern Communication Technologies for 5G & Beyond	9
<i>ONE class among the following (free choice):</i>	<i>THREE classes among the following (free choice):</i>	
Computational Electromagnetics**	Computational Electromagnetics**	6
Cybersecurity**	Cybersecurity**	6
Industrial Reliability & Safety Engineering***	Industrial Reliability & Safety Engineering***	6
Mobile Communications and IoT**	Mobile Communications and IoT**	6
Sensors & Microsystems***	Sensors & Microsystems***	6
Virtual Instrumentation & Digital Embedded Electronics***	Virtual Instrumentation & Digital Embedded Electronics***	6
<b>SECOND YEAR – FIRST SEMESTER</b>		
Antennas & Propagation	Antennas & Propagation	9
Information Theory	Information Theory	6
	Advanced Digital Image Processing	9
<i>TWO classes among the following (free choice):</i>	<i>ONE class among the following (free choice):</i>	
Design of Applications & Services	Design of Applications & Services	6
Electric System & Green Power Devices***	Electric System & Green Power Devices***	6
Machine Learning	Machine Learning	6
RFID Technologies**	RFID Technologies**	6
<b>SECOND YEAR – SECOND SEMESTER</b>		
Internship	Internship	9
Master Thesis	Master Thesis	21
<i>ONE class among the following (free choice):</i>		
Cybersecurity**		6
Mobile Communications and IoT**		6
Sensors & Microsystems***		6

\* Among the free choices, it is possible to choose other classes taught at the University of Siena, up to a maximum of 12 CFUs, if they are coherent with the course aims and pursuant to the academic regulations.

\*\* At least one of the double-starred classes must be included in the study plan.

\*\*\* At least one of the three-starred classes must be included in the study plan.

## DETAILED INFORMATION AND SPECIFICATIONS

### Piano di Studi LM Curriculum Telecommunications for the Digital Society

#### Primo Anno

denominazione attività formativa/insegnamento	SSD	CFU	Ore	Sem.	TAF	Eventuali Mutuazioni
Digital communications	ING-INF/03	9	72	I	B	
Statistical signal processing	ING-INF/03	6	48	I	B	
Networking	ING-INF/03	6	48	I	B	
Analog circuit design	ING-INF/01	6	48	I	C	
Mathematical methods for engineering	MAT/05	6	48	II	C	Laurea Magistrale in Artificial Intelligence and Automation Engineering
<b>Percorso A:</b> 2 insegnamenti del seguente gruppo <b>Percorso B:</b> 1 insegnamento del seguente gruppo						
Microwave engineering	ING-INF/02	9	72	II	B	
Modern communication technologies for 5G and beyond	ING-INF/03	9	75	II	B	
<b>Percorso A:</b> 1 insegnamento dal seguente gruppo* <b>Percorso B:</b> 3 insegnamenti dal seguente gruppo*						
Mobile communications and IoT	ING-INF/03	6	48	II	B	
Cybersecurity	ING-INF/03	6	54	II	B	
Computational electromagnetics	ING-INF/02	6	48	II	B	
Industrial reliability and safety engineering	ING-INF/07	6	48	II	C	
Sensors and microsystems	ING-INF/07	6	48	II	C	Laurea Magistrale in Artificial Intelligence and Automation Engineering
Virtual instrumentation and digital embedded electronics	ING-INF/01	6	48	II	C	
Totale CFU dell'anno		57/60				

#### Secondo Anno

denominazione attività formativa/insegnamento	SSD	CFU	Ore	Sem.	TAF	Eventuali Mutuazioni
Antennas and propagation	ING-INF/02	9	75	I	B	
Information theory	ING-INF/03	6	54	I	B	
<b>Percorso B</b>						
Advanced digital image processing	ING-INF/03	9	74	I	B	
Tirocinio		9	225	II	F	
Prova finale (tesi)		21			E	
<b>Percorso A:</b> 3 insegnamenti dal seguente gruppo di cui 2 del primo semestre e 1 del secondo* <b>Percorso B:</b> 1 insegnamento del primo semestre dal seguente gruppo*						
Design of applications and services	ING-INF/05	6	48	I		Design of applications, services and systems Laurea Magistrale in Artificial Intelligence and Automation Engineering

Machine learning	ING-INF/05	6	54	I		Machine learning Laurea Magistrale in Artificial Intelligence and Automation Engineering
Electric system and green power devices	ING-IND/31	6	48	I	C	Laurea Magistrale in Engineering Management
RFID technologies	ING-INF/02	6	48	I	B	
Mobile communications and IoT	ING-INF/03	6	48	II	B	
Sensors and microsystems	ING-INF/07	6	48	II	C	Laurea Magistrale in Artificial Intelligence and Automation Engineering
Cybersecurity	ING-INF/03	6	54	II	B	
<b>Totale CFU dell'anno</b>		<b>63/60</b>				

\* complessivamente almeno 1 insegnamento di TAF B e 1 insegnamento di TAF C. Possono essere scelti fino a

### Curriculum Electronics for Smart Industry

#### Primo Anno

denominazione attività formativa/insegnamento	SSD	CFU	Ore	Sem.	TAF	Eventuali Mutuazioni
Digital communications	ING-INF/03	9	72	I	B	
Statistical signal processing	ING-INF/03	6	48	I	B	
Electric system and green power devices	ING-IND/31	6	48	I	C	Laurea Magistrale in Engineering Management
Mathematical methods for engineering	MAT/05	6	48	II	C	Laurea Magistrale in Artificial Intelligence and Automation Engineering
Industrial reliability and safety engineering	ING-INF/07	6	48	II	C	
Digital embedded electronics for smart industry	ING-INF/01	9	72	II	C	
<b>Percorso A:</b> 1 insegnamento del seguente gruppo						
Microwave engineering	ING-INF/02	9	72	II	B	
Modern communication technologies for 5G and beyond	ING-INF/03	9	75	II	B	
<b>Percorso A:</b> 1 insegnamento del primo semestre dal seguente gruppo*						
<b>Percorso B:</b> 2 insegnamenti dal seguente gruppo di cui 1 del primo semestre e 1 del secondo*						
Networking	ING-INF/03	6	48	I	B	
Analog circuit design	ING-INF/01	6	48	I	C	
Computational electromagnetics	ING-INF/02	6	48	II	B	
Mobile communications and IoT	ING-INF/03	6	48	II	B	
Cybersecurity	ING-INF/03	6	54	II	B	
<b>Percorso B</b>						
Sensors and microsystems	ING-INF/07	6	48	II	C	Laurea Magistrale in Artificial Intelligence and Automation Engineering

Totale CFU dell'anno		57/60				
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## Secondo Anno

denominazione attività formativa/insegnamento	SSD	CFU	Ore	Sem.	TAF	Eventuali Mutuazioni
Antennas and propagation	ING-INF/02	9	75	I	B	
Information theory	ING-INF/03	6	54	I	B	
<b>Percorso A</b>						
Sensors and microsystems	ING-INF/07	6	48	II	C	Laurea Magistrale in Artificial Intelligence and Automation Engineering
<b>Percorso B</b>						
Advanced digital image processing	ING-INF/03	9	74	I	B	
Tirocinio		9	225	II	F	
Prova finale (tesi)		21			E	
<b>Percorso A: 2 insegnamenti dal seguente gruppo*</b>						
<b>Percorso B: 1 insegnamento dal seguente gruppo*</b>						
Advanced computer architectures	ING-INF/05	6	48	I		High performance computer architecture Laurea Magistrale in Artificial Intelligence and Automation Engineering
Digital modelling, design and manufacturing	ING-IND/13	6	54	I		Laurea Magistrale in Engineering Management
RFID technologies	ING-INF/02	6	48	I	B	
Totale CFU dell'anno		63/60				

\* complessivamente almeno 1 insegnamento di TAF B. Possono essere scelti fino a due insegnamenti