

B.Tech (Electronics and Communication Engineering) – 2023 Batch

Program Educational Objectives (PEOs)

- **PEO I:** Graduates demonstrate their technical knowledge in the field of Electronics and Communication Engineering for real world applications.
- **PEO II:** Graduates exhibit competence as academicians, researchers and entrepreneurs by pursuing continuous professional development.
- **PEO III:** Graduates contribute to the development of the society with professional ethics.

Program Specific Outcomes (PSOs)

- **PSO 1:** Impart solid foundation in mathematical, scientific and engineering fundamentals required to solve electronics and communication engineering problems.
- **PSO 2:** Specify, analyze and design the electronic systems using semiconductor technology.
- **PSO 3:** Understand, analyze, design and simulate the various communication systems, data processing techniques and validate their performance for practical applications.
- **PSO 4:** Specify, analyze, design, implement and test the analog and digital systems using the state of art components, software tools and ICT.

COURSE COMPONENTS & CURRICULUM

PROGRAM STRUCTURE			
S.No	Category		Credits
1	Basic Science Courses	BSC	12
2	Engineering Science Courses including workshop, drawing, basics of electrical/mechanical/computer etc.	ESC	20
3	Humanities and Social Sciences including Management Courses	HSMC	8
4	Professional core Courses	PCC	65
5	Professional Elective Courses relevant to chosen specialization/branch	PEC	24/30
6	Open Electives – Electives from other technical and /or emerging Courses	OEC	6
7	Project and Internship	P	18/12
8	Mandatory Courses	MC	0
9	Skill based Courses	SBC	7
10	Online Courses		5*
Total Credits			160+5*

*The students shall earn 5 credits through online courses between 2nd and 7th semester (both inclusive)

Basic Science Courses (BSC)						
Sl. No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	22EC1001	Physical Electronics	2	0	2	2
2	22EC1002	Physical Electronics Laboratory	0	0	2	1
3	20MA1009	Calculus and Differential Equations	3	0	0	3
4	20MA1010	Linear Algebra, Transforms and Numerical Methods	3	0	0	3
5	20MA2006	Probability and Stochastic processes	3	0	0	3
			Total			12
Engineering Science Courses (ESC)						
Sl. No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20EC1001/ 20EC1002	Python Programming / R Programming	2	0	0	2
2	18ME1002	Engineering Graphics	0	0	2	1
3	22EC1004	Fundamentals of Electrical and Electronics Engineering	3	0	0	3
4	23EC1002	Programming for Problem Solving with C	3	0	0	3
5	20EC1004	C Programming Laboratory	0	0	2	1

6	23EC1004	C++ and Data Structures	3	0	0	3
7	23EC1005	C++ and Data Structures Laboratory	0	0	2	1
8	23EC2025	Electromagnetic Fields and Waveguides	3	0	0	3
9	23EC2012	Network Theory	3	0	0	3
			Total			20
Skill Based Courses (SBC)						
1	22EC1003	PCB Design Using CAD Tools	0	0	2	1
2	20EC1005	Electronics for Intelligent Machines laboratory	0	0	2	1
3	19EC2001	Electronics for Intelligent Machines	2	0	0	2
4	23EC1006	Programming for Circuit Design	3	0	0	3
			Total			7
Humanities & Social Sciences Including Management Courses (HSMC)						
Sl. No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
Category-1		Humanities, Social Sciences and Management Courses				5
1	20MS2005	Soft Skill	1	0	0	1
2	19EN1001/ 19LN1001/ 17LN2007	English / German / Basic French	2	0	0	2
3	20MS2006	Professional Ethics	2	0	0	2
Category-2		Entrepreneurship				3
1	23MS2001	Concepts and Application in Entrepreneurship	3	0	0	3
			Total			8
PROFESSIONAL CORE COURSES (PCC)						
Sl. No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20EC2002	Electronic Devices	3	0	0	3
2	18EC2002	Electronic Devices Laboratory	0	0	2	1
3	22EC2013	Digital System Design	2	1	0	3
4	22EC2014	Digital System Design Laboratory	0	0	2	1
5	20EC2003	Signals and Systems	2	1	0	3
6	22EC2015	Communication Theory and Systems	3	0	0	3
7	22EC2016	Digital Communication	3	0	0	3
8	18EC2007	Analog and Digital Communication Laboratory	0	0	2	1
9	18EC2008	Analog Circuits	3	0	0	3
10	22EC2032	Analog Circuits Laboratory	0	0	2	1
11	23EC2013	Microcontrollers	3	0	0	3
12	18EC2011	Microcontrollers Laboratory	0	0	2	1
13	18EC2012	Linear Integrated Circuits	3	0	0	3
14	20EC2004	Computer Architecture	3	0	0	3
15	18EC2015	Digital Signal Processing	3	0	0	3
16	18EC2016	Digital Signal Processing Laboratory	0	0	2	1
17	23EC2014	Control Systems	3	0	0	3
18	18EC2017	Computer Network	3	0	0	3
19	23EC2007	VLSI Design	3	0	0	3
20	23EC2019	Antenna Theory and Wave Propagation	3	0	0	3
21	18EC2021	Microwave and Optical Communication	3	0	0	3
22	22EC2011	Microwave and Optical Communication Laboratory	0	0	2	1
23	23EC2009	Principles and Design of IoT Systems	3	0	0	3
24	23EC2010	Embedded Systems and IoT Laboratory	0	0	2	1

25	23EC2008	VLSI Design Laboratory	0	0	2	1
26	20EC2009	Artificial Neural Networks and Deep Learning	2	0	0	2
27	23EC2011	Digital Image Processing	3	0	0	3
28	20EC2008	5G Communications	3	0	0	3
			Total			65
PROJECT AND INTERNSHIP						
Sl. No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	ITP2921	Industrial Training -1	15 Days			1
2	ISP2921	Internship – 1	15 Days			1
3	ISP2911	Internship -2	30 Days			2
4	23EC2998/ 23EC2999	Project	-			8/14
			Total			12/18
MANDATORY COURSES (MC)						
Sl. No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	18MS2014	Constitution of India	2	0	0	0
2	18CH2001	Environmental Studies	2	0	0	0
			Total			0
ONLINE COURSES						
The students shall earn 5 credits through online courses between 2 nd and 7 th semester (both inclusive)					5	

Professional Electives for Specialization in IoT

Course Code	Course Title	L	T	P	Credits
22EC2021	Industrial IoT	3	0	0	3
22EC2022	Building the Web of Things	3	0	0	3
22EC2023	IoT Security and Trust	3	0	0	3
22EC2024	Cognitive IoT	3	0	0	3
22EC2025	Energy Harvesting for IoT devices	3	0	0	3
22EC2026	IoT Data Analytics	3	0	0	3

Professional Electives for Specialization in Artificial Intelligence

Course Code	Course Title	L	T	P	Credits
22EC2005	Pattern Recognition Techniques	3	0	0	3
22EC2006	Deep Learning	3	0	0	3
22EC2007	Natural Language Processing	3	0	0	3
22EC2008	Introduction to Human Computer Interaction	3	0	0	3
22EC2009	Bio-inspired Optimization Techniques	3	0	0	3
22EC2027	Brain Computer Interface	3	0	0	3

SEMESTER-WISE CURRICULUM

SEMESTER 1

Course Code	Course Title	Category	L	T	P	Credits
22EC1001	Physical Electronics	BSC	2	0	0	2
22EC1004	Fundamentals of Electrical and Electronics Engineering	ESC	3	0	0	3
20MA1009	Calculus and Differential Equations	BSC	3	0	0	3
23EC1002	Programming for Problem Solving with C	ESC	3	0	0	3
20EC1001	Python Programming	ESC	2	0	0	2
19EN1001/ 19LN1001/	English / German / Basic French	HSMC	2	0	0	2

17LN2007						
18ME1002	Engineering Graphics	ESC	0	0	2	1
	Mandatory course – I	MC				0
LABORATORY COURSES						
22EC1002	Physical Electronics Laboratory	BSC	0	0	2	1
20EC1004	C Programming Laboratory	ESC	0	0	2	1
	Total Credits					18

SEMESTER 2

Course Code	Course Title	Category	L	T	P	Credits
20MA1010	Linear Algebra, Transforms and Numerical Methods	BSC	3	0	0	3
23EC1004	C++ and Data Structures	ESC	3	0	0	3
23EC2012	Network Theory	ESC	3	0	0	3
19EC2001	Electronics for Intelligent Machines	SBC	2	0	0	2
20MS2005	Soft Skills	HSMC	1	0	0	1
ITP2921	Industrial training -1	P	0	0	2	1
	Mandatory Course-II	MC	3	0	0	0
23EC1006	Programming for Circuit Design	SBC	3	0	0	3
23MS2001	Concepts and Application in Entrepreneurship	HSMC	3	0	0	3
LABORATORY COURSES						
23EC1005	C++ and Data Structures Laboratory	ESC	0	0	2	1
20EC1005	Electronics for Intelligent Machines Laboratory	SBC	0	0	2	1
22EC1003	PCB Design using CAD Tools	SBC	0	0	2	1
	Total Credits					22*

*Mandatory MOOC for 1 Credit

SEMESTER 3

Course Code	Course Title	Category	L	T	P	Credits
20MA2006	Probability and Stochastic Process	BSC	3	0	0	3
20EC2002	Electronic Devices	PCC	3	0	0	3
22EC2013	Digital System Design	PCC	2	1	0	3
20EC2003	Signals and Systems	PCC	2	1	0	3
23EC2025	Electromagnetic Fields and Waveguides	ESC	3	0	0	3
20MS2006	Professional Ethics	HSMC	2	0	0	2
ISP2921	Internship - 1	P	0	0	2	1
LABORATORY COURSES						
18EC2002	Electronic Devices Laboratory	PCC	0	0	2	1
22EC2014	Digital System Design Laboratory	PCC	0	0	2	1
	Total Credits					20

SEMESTER 4

Course Code	Course Title	Category	L	T	P	Credits
22EC2015	Communication Theory and Systems	PCC	3	0	0	3
18EC2015	Digital Signal Processing	PCC	3	0	0	3
18EC2008	Analog Circuits	PCC	3	0	0	3
18EC2012	Linear Integrated Circuits	PCC	3	0	0	3
20EC2004	Computer Architecture	PCC	3	0	0	3
	Professional Elective - 1	PEC	3	0	0	3
LABORATORY COURSES						
18EC2016	Digital Signal Processing Laboratory	PCC	0	0	2	1
22EC2032	Analog Circuits Laboratory	PCC	0	0	2	1
	Total Credits					20*

*Mandatory MOOC for 2 credits

SEMESTER 5

Course Code	Course Title	Category	L	T	P	Credits
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23EC2013	Microcontrollers	PCC	3	0	0	3
23EC2019	Antenna Theory and Wave Propagation	PCC	3	0	0	3
22EC2016	Digital Communication	PCC	3	0	0	3
23EC2011	Digital Image Processing	PCC	3	0	0	3
	Professional Elective – 2	PEC	3	0	0	3
	Open Elective – 1	OEC	3	0	0	3
ISP2911	Internship -2	P	0	0	4	2
LABORATORY COURSES						
18EC2011	Microcontrollers Laboratory	PCC	0	0	2	1
18EC2007	Analog and Digital Communication Laboratory	PCC	0	0	2	1
	Total Credits					22

SEMESTER 6

Course Code	Course Title	Category	L	T	P	Credits
	Professional Elective – 3	PEC	3	0	0	3
	Professional Elective – 4	PEC	3	0	0	3
20EC2009	Artificial Neural Networks and Deep Learning	PCC	2	0	0	2
20EC2008	5G Communications	PCC	3	0	0	3
23EC2014	Control Systems	PCC	3	0	0	3
23EC2007	VLSI Design	PCC	3	0	0	3
23EC2009	Principles and Design of IoT Systems	PCC	3	0	0	3
LABORATORY COURSES						
23EC2008	VLSI Design Laboratory	PCC	0	0	2	1
23EC2010	Embedded systems and IoT Laboratory	PCC	0	0	2	1
	Total Credits					22*

*Mandatory MOOC for 2 credits

SEMESTER 7

Course Code	Course Title	Category	L	T	P	Credits
18EC2017	Computer Network	PCC	3	0	0	3
	Professional Elective -5	PEC	3	0	0	3
	Professional Elective -6	PEC	3	0	0	3
	Professional Elective -7	PEC	3	0	0	3
	Professional Elective -8	PEC	3	0	0	3
18EC2021	Microwave and Optical Communication	PCC	3	0	0	3
	Open Elective – 2	OEC	3	0	0	3
LABORATORY COURSES						
22EC2011	Microwave and Optical Communication Laboratory	PCC	0	0	2	1
	Total Credits					22

SEMESTER 8

Course Code	Course Title	Category	L	T	P	Credits
	Half Semester Project					
	Professional Elective -9	PEC	3	0	0	3
	Professional Elective -10	PEC	3	0	0	3
23EC2998	Project	P	0	0	16	8
	Full Semester Project					
23EC2999	Project	P	0	0	28	14
	Total Credit					14