B.Tech (Electronics and Communication Engineering) – 2020 & 2021 Batch

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	24
3	Humanities and Social Sciences including Management courses	HSMC	15
4	Professional core courses	PCC	64
5	Professional Elective courses relevant to chosen specialization/branch	PEC	24
6	Open subjects – Electives from other technical and /or emerging Courses	OES	6
7	Project work, seminar and internship in industry or elsewhere	P	15
8	Mandatory Courses [Environment studies, Induction Programme, Indian Constitution, Value Education, etc.]	MC	0
9	Online Courses		5*
	Total Credits		**160+5***

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

COURSE COMPONENTS

Basic Science Courses (BSC)						
Sl. No	**Code No.**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	20PH1011	Physical Electronics	2	0	2	2
2	20PH1012	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	**Code No.**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	18EC1001	CAD tools for Electronics Engineers	0	0	2	1
2	20EC1001/ 20EC1002	Python Programming / R Programming	2	0	0	2
3	18ME1002	Engineering Graphics	0	0	2	1
4	19EC1001	Fundamentals of Electrical and Electronics Engineering	3	1	0	4
5	19EC1002	Fundamentals of Electrical and Electronics Engineering Laboratory	0	0	2	1
6	20EC1003	Programming for Problem Solving with C	2	0	0	2
7	20EC1004	C Programming Laboratory	0	0	2	1
8	18EC2022	Object Oriented concepts using C++	3	0	0	3
9	18EC1002	PCB Design and Fabrication Laboratory	0	0	2	1
10	20EC1005	Electronics For Intelligent Machines laboratory	0	0	2	1
11	19EC2001	Electronics for Intelligent Machines	2	0	0	2

12	20EC2001	Electronic Measurement Laboratory	0	0	2	1
13	18EE2002	Network Theory	3	0	0	3
14	ITP2911	Industrial Training (2 Weeks)	0	0	2	1
			Total			**24**
Humanities & Social Sciences Including Management Courses (HSMC)						
Sl. No	**Code No.**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
Category-1		**Humanities, Social Sciences and Management Courses**				**5**
1	20MS2005	Soft Skills	1	0	0	1
2	19EN1001/ 19LN1001/ 17LN2007	English / German / Basic French	2	0	0	2
3	18MS2001	Professional Ethics	2	0	0	2
Category-2		**Entrepreneurship**				**10**
1	20MS2003	Concept of Entrepreneurship	1	0	0	1
2	20MS2004	Entrepreneurship and Product Development	3	0	0	3
3	18MS2002	Industrial Management	3	0	0	3
4	20MS2008	Artificial Intelligence for Business	3	0	0	3
			Total			**15**
PROFESSIONAL CORE COURSES (PCC)						
Sl. No	**Code No.**	**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	18EC2003	Digital System Design	3	0	0	3
4	18EC2004	Digital System Design Laboratory	0	0	2	1
5	20EC2003	Signals and Systems	2	1	0	3
6	18EC2006	Analog and Digital Communication	3	0	0	3
7	18EC2007	Analog and Digital Communication Laboratory	0	0	2	1
8	18EC2008	Analog Circuits	3	0	0	3
9	18EC2009	Analog Circuits Laboratory	0	0	2	1
10	18EC2010	Microcontrollers	3	0	0	3
11	18EC2011	Microcontrollers Laboratory	0	0	2	1
12	18EC2012	Linear Integrated Circuits	3	0	0	3
13	18EC2023	Electromagnetic Waves & Wave Guides	3	0	0	3
14	20EC2012	Electromagnetics and Radiation Laboratory	0	0	2	1
15	20EC2004	Computer Architecture	3	0	0	3
16	18EC2015	Digital Signal Processing	3	0	0	3
17	18EC2016	Digital Signal Processing Laboratory	0	0	2	1
18	18EI2002	Control Systems	3	0	0	3
19	18EC2017	Computer Network	3	0	0	3
20	18EC2018	Computer Network Laboratory	0	0	2	1
21	18EC2019	Digital IC Design	3	0	0	3
22	18EC2020	Antennas and Propagation	3	0	0	3
23	18EC2021	Microwave and Optical Communication	3	0	0	3
24	19EC2003	Microwave and Optical Communication Lab	0	0	2	1
25	20EC2005	IoT for Communication Engineering	3	0	0	3
26	20EC2006	IoT for Communication Engineering Laboratory	0	0	2	1
27	20EC2007	ARM Processor Laboratory	0	0	2	1
28	20EC2008	5G Communications	3	0	0	3

29	20EC2009	Artificial Neural Networks and Deep learning	2	0	0	2
			Total			**64**
PROFESSIONAL ELECTIVE COURSES (PEC)						
Sl. No	**Code No.**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	19EC2004	CAD for Electronics Engineers	3	0	0	3
2	19EC2005	Fiber Optic Communication	3	0	0	3
3	19EC2007	Embedded System Design	3	0	0	3
4	19EC2008	ARM Processors	3	0	0	3
5	19EC2009	Telecommunication Switching Networks	3	0	0	3
6	19EC2011	High Speed Networks	3	0	0	3
7	19EC2012	Wireless Sensor Networks	3	0	0	3
8	19EC2013	Optoelectronics	3	0	0	3
9	19EC2014	Basics of Satellite Communication	3	0	0	3
10	19EC2015	Principles of Digital Image Processing	3	0	0	3
11	19EC2016	Multimedia Compression Techniques	3	0	0	3
12	19EC2017	Information Theory and Coding	3	0	0	3
13	19EC2018	System Verilog for Functional Verification	3	0	0	3
14	19EC2019	ASIC Design	2	0	0	2
15	19EC2020	Analysis and Design of Digital IC	3	0	0	3
16	19EC2021	Low power techniques in VLSI design	3	0	0	3
17	19EC2022	Nanoelectronics	3	0	0	3
18	19EC2023	RF Integrated Circuit Design	3	0	0	3
19	19EC2024	Machine Learning Techniques	3	0	0	3
20	19EC2025	Semiconductor Device Modelling	3	0	0	3
21	19EC2026	Micro Electro Mechanical Systems	3	0	0	3
22	19EC2027	MATLAB programming for Engineers	3	0	0	3
23	19EC2028	Fundamentals of Wireless Communication	3	0	0	3
24	19EC2029	Data Science and Data analytics	3	0	0	3
25	19EC2030	Cloud Computing	3	0	0	3
26	19EC2031	IoT Edge Computing	3	0	0	3
27	19EC2032	Communication Quality of Service	3	0	0	3
28	19EC2033	Cryptography and Network Security	3	0	0	3
29	19EC2034	Fundamentals of Hardware IP Protection	3	0	0	3
30	19EC2035	Fault Tolerant Architectures for Hardware security	3	0	0	3
31	19EC2036	Neural networks and Deep Learning	3	0	0	3
32	19EC2037	Real Time Operating System	3	0	0	3
33	19EC2038	IoT Based Data Acquisition Systems and Protocols	3	0	0	3
34	19EC2039	Augmented Reality	3	0	0	3
35	19EC2040	Internet of Intelligent Things	3	0	0	3
36	19EC2041	Cellular Mobile Computing	3	0	0	3
37	19EC2042	Wearable and Implantable Devices	3	0	0	3
38	19EC2043	Testing of VLSI Circuits	3	0	0	3
39	19EC2044	Electromagnetic Interference and Compatibility	3	0	0	3
40	19EC2045	SoC Design	3	0	0	3
41	19EC2046	Speech Processing	3	0	0	3
42	18BM2018	Bioelectronics	3	0	0	3
43	20EC2010	VLSI for IoT Systems	3	0	0	3
44	20EC2011	Software Defined Radio Laboratory	0	0	2	1
			Total			**24**
OPEN ELECTIVE COURSES (OEC)						

Sl. No	Code No.	Course Title	Hours per week			Credits
			L	T	P	
1	19EC2047	Fundamentals of Electronics	3	0	0	3
2	19EC2048	Communication Engineering	3	0	0	3
3	19EC2049	MATLAB Programming	3	0	0	3
4	19EC2050	Sensors for IoT Applications	3	0	0	3
5	19EC2051	Microprocessor and Interfacing Techniques	3	0	0	3
6	19EC2052	Digital System Design using HDL	3	0	0	3
7	19EC2053	FPGA implementation of Digital Circuits	3	0	0	3
8	19EC2054	Fundamentals of MEMS	3	0	0	3
9	19EC2055	PCB design and Fabrication	3	0	0	3
10	19EC2056	Electronics for Biotechnology	3	0	0	3
11	19EC2057	Artificial Neural Networks	3	0	0	3
12	19EC2058	Signal Processing Techniques	3	0	0	3
13	19EC2059	Fundamentals of Satellite Communication	3	0	0	3
14	19EC2060	Antennas for Biomedical Applications	3	0	0	3
15	19EC2061	Embedded Systems	3	0	0	3
			Total			**6**

PROJECT WORK AND INTERNSHIP

Sl. No	Code No.	Course Title	Hours per week			Credits
			L	T	P	
1	ITP2921 / ISP2921	Industrial training -1 / Internship - 1	15 Days			1
2	ITP2922 / ISP2922	Industrial training -2 / Internship - 2	15 Days			1
3	ITP2923 / ISP2923	Industrial training -3 / Internship -3	15 Days			1
4	20EC2998	Projects / Patent / Products	-			12
			Total			**15**

MANDATORY COURSES

Sl. No	Code No.	Course Title	Hours per week			Credits
			L	T	P	
1	18MS2014	Constitution of India	2	0	0	0
2	18CH2001	Environmental Studies	3	0	0	0
			Total			**0**
		ONLINE COURSES				
	The students shall earn 5 credits through online courses between 2nd and 7th semester (both inclusive)					**5**

SEMESTER-WISE CURRICULUM

SEMESTER 1

Course Code	Course Title	L	T	P	Credits
20PH1011	Physical Electronics	2	0	0	2
20PH1012	Physical Electronics Laboratory	0	0	2	1
19EC1001	Fundamentals of Electrical and Electronics Engineering-project based course	3	1	0	4
19EC1002	Fundamentals of Electrical and Electronics Engineering Laboratory	0	0	2	1
20MA1009	Calculus and Differential Equations	3	0	0	3
19EN1001/ 19LN1001/ 17LN2007	English / German / Basic French	2	0	0	2
18ME1002	Engineering Graphics	0	0	2	1

	Mandatory course – I				0
	Total Credits				**14**

SEMESTER 2

Course Code	Course Title	L	T	P	Credits
18EC1001	CAD tools for Electronics Engineers-project based course	0	0	2	1
20MA1010	Linear Algebra, Transforms and Numerical Methods	3	0	0	3
20EC1003	Programming for Problem Solving with C	2	0	0	2
20EC1004	C Programming Laboratory	0	0	2	1
18EC1002	PCB Design and Fabrication Laboratory-project based course	0	0	2	1
19EC2001	Electronics For Intelligent Machines-design thinking course	2	0	0	2
20EC1005	Electronics For Intelligent Machines Laboratory	0	0	2	1
20EC1001/ 20EC1002	Python Programming/ R programming – project based course	2	0	0	2
20MS2005	Soft Skills	1	0	0	1
	Mandatory Course-II				0
	Total Credits				**14**

SEMESTER 3

Course Code	Course Title	L	T	P	Credits
20EC2002	Electronic Devices	3	0	0	3
18EC2002	Electronic Devices Laboratory	0	0	2	1
18EC2003	Digital System Design-project based course	2	1	0	3
18EC2004	Digital System Design Laboratory	0	0	2	1
18EC2023	Electromagnetic waves and waveguides	2	1	0	3
18EE2002	Network Theory	3	0	0	3
18EI2002	Control Systems	3	0	0	3
18EC2022	Object Oriented Concepts using C++ (project based course)	3	0	0	3
	Open Elective - 1	3	0	0	3
ITP2921/ MP2921	Industrial Training/ Mini Project I	0	0	2	1
	Total Credits				**24**

SEMESTER 4

Course Code	Course Title	L	T	P	Credits
18EC2006	Analog and Digital Communication-project based course	3	0	0	3
18EC2007	Analog and Digital Communication Laboratory	0	0	2	1
18EC2008	Analog Circuits	2	1	0	3
18EC2012	Linear Integrated Circuits	3	0	0	3
18EC2009	Analog Circuits Laboratory	0	0	2	1
20EC2003	Signals and Systems	2	1	0	3
20EC2004	Computer Architecture-project based course	3	0	0	3
20EC2001	Electronic Measurement Laboratory	0	0	2	1
	Professional Elective - 1	3	0	0	3
18MS2002	Industrial Management	3	0	0	3
ISP2921	Internship I	0	0	2	1
	Total Credits				**25**

SEMESTER 5

Course Code	Course Title	L	T	P	Credits
18EC2010	Microcontroller	2	1	0	3
18EC2011	Microcontroller Laboratory	0	0	2	1
20MA2006	Probability and Stochastic Process	3	0	0	3

18EC2020	Antennas and Propagation-project based course	3	0	0	3
18EC2015	Digital Signal Processing-project based course	3	0	0	3
18EC2016	Digital Signal Processing Laboratory	0	0	2	1
ISP2922	Internship II	0	0	2	1
20EC2012	Electromagnetics and Radiation Laboratory	0	0	2	1
20MS2003	Concepts of Entrepreneurship	1	0	0	1
	Professional Elective – 2	3	0	0	3
	Open Elective – 2	3	0	0	3
	Total Credits				**23**

SEMESTER 6

Course Code	Course Title	L	T	P	Credits
20EC2009	Artificial Neural Networks and Deep learning	2	0	0	2
18EC2017	Computer Network (project based course)	3	0	0	3
18EC2018	Computer Network Laboratory	0	0	2	1
ISP2923	Internship III	0	0	2	1
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Professional Elective – 5	3	0	0	3
20MS2006	Professional Ethics	2	0	0	2
18EC2019	Digital IC Design (project based course)	3	0	0	3
20EC2005	IoT for Communication Engineering	3	0	0	3
20EC2006	IoT for Communication Engineering Laboratory	0	0	2	1
	Total Credits				**25**

SEMESTER 7

Course Code	Course Title	L	T	P	Credits
	Professional Elective -6 (project based course)	3	0	0	3
	Professional Elective -7	3	0	0	3
20EC2008	5G communications	3	0	0	3
20MS2004	Entrepreneurship and Product Development	3	0	0	3
20EC2007	ARM processor Laboratory	0	0	2	1
18EC2021	Microwave and Optical Communication (project based course)	3	0	0	3
19EC2003	Microwave and Optical Communication Lab	0	0	2	1
	Total Credits				**17**

SEMESTER 8

Course Code	Course Title	L	T	P	Credits
20MS2008	Artificial Intelligence for Business	3	0	0	3
	Professional Elective -8	3	0	0	3
20EC2998	Project/patent/products	0	0	24	12
	Total Credits				**18**