B.Tech. Programme

Electronics and Communication Engineering

CURRICULUM

for 2015 admissions onwards

GENERAL INFORMATION

Code Numbering:

Each course is assigned an 8-character Code number. The first two digits indicate the year of curriculum revision. The next three letters indicate the Department offering the course. The last three digits are unique to the course – the first digit indicates the level of the course (100, 200, 300, 400 etc.); the second digit indicates the type of the course, viz. 0, 1 and 2 indicate the core courses; 3,4,5,6 and 7 indicate the Elective courses; 8 indicates the Lab. or practical-based courses and 9 indicates Projects.

ABBREVIATIONS USED IN THE CURRICULUM:

Cat.	-	Category;
L	-	Lecture;
T	-	Tutorial;
P	-	Practicals;
Cr	-	Credits;
ES	-	Exam Slot;
ENGG.	-	Engineering Sciences (including General, Core and Electives);
HUM	-	Humanities (including Languages and others);
SCI	-	Basic Sciences (including Mathematics);
PRJ	-	Project Work (including Seminars).

Departments

AES	-	Aerospace Engineering;
CHE	-	Chemical Engineering;
CHY	-	Chemistry;
CSE	-	Computer Science and Engineering;
CUL	-	Cultural Education;
CVL	-	Civil Engineering;
ECE	-	Electronics and Communication Engineering;
EEE	-	Electrical and Electronics Engineering;
EIE	-	Electronics and Instrumentation Engineering;
HUM	-	Humanities and Languages;
MAT	-	Mathematics;
MEC	-	Mechanical Engineering;
PHY	-	Physics;
SWK	-	Social Work.

Category-wise distribution of credits for B Tech Electronics and Communication Engineering programme:

Humanities - 22 credits; Basic Sciences - 25 credits;
Engineering Sciences - 108 credits; Project Work - 12 credits.   **Total = 167 Credits**

Semester I

Cat.	Code	Course Title	L-T-P	Cr	ES
HUM	15ENG111	Communicative English	2 0 2	3	A
SCI	15MAT111	Calculus and Matrix Algebra	2 1 0	3	B
ENGG	15CSE100	Computational Thinking and Problem Solving	3 0 2	4	D
SCI	15PHY100/ 15CHY100	Physics / Chemistry	3 0 0	3	C
SCI	15PHY181/ 15CHY181	Physics Lab. / Chemistry Lab.	0 0 2	1	L1
ENGG	15MEC180/ 15EEE180	Workshop A/ Workshop B	0 0 2	1	L2
ENGG	15MEC100	Engineering Drawing - CAD	2 0 2	3	E
HUM	15CUL101	Cultural Education I	2 0 0	2	F
			Total	**20**	

Semester II

Cat.	Code	Course Title	L-T-P	Cr	ES
SCI	15MAT121	Vector Calculus and Ordinary Differential Equations	3 1 0	4	B
SCI	15CHY100/ 15PHY100	Chemistry/ Physics	3 0 0	3	C
ENGG	15CSE102	Computer Programming	3 0 0	3	D
ENGG	15ECE111	Solid State Devices	3 0 0	3	E
ENGG	15ECE112	Fundamentals of Electrical Technology	3 1 0	4	A
SCI	15CHY181/ 15PHY181	Chemistry Lab. / Physics Lab.	0 0 2	1	L1
ENGG	15EEE180/ 15MEC180	Workshop B/ Workshop A	0 0 2	1	L2
ENGG	15CSE180	Computer Programming Lab.	0 0 2	1	L3
HUM	15CUL111	Cultural Education II	2 0 0	2	F
			Total	**22**	

Semester III

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15ECE201	Applied Electromagnetics	3 1 0	4	A
ENGG	15ECE202	Digital Circuits and Systems	3 1 0	4	C
ENGG	15ECE203	Network Theory	3 0 0	3	D
ENGG	15ECE204	Signal Processing I	3 1 0	4	E
SCI	15MAT202	Linear Algebra	2 1 0	3	B
HUM		Humanities Elective I		2	H
ENGG	15ECE281	Digital Circuits and Systems Lab.	0 0 2	1	L1
ENGG	15ECE282	Signal Processing I Lab.	0 0 2	1	L2
HUM	15AVP201	Amrita Values Programme I	1 0 0	1	F
			Total	**23**	

Semester IV

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15ECE211	Electronic Circuits	3 1 0	4	A
ENGG	15ECE212	Signal Processing II	3 1 0	4	C
ENGG	15ECE213	Transmission Lines and Waveguides	3 0 0	3	D
SCI	15MAT213	Probability and Random Processes	3 1 0	4	B
HUM		Humanities Elective II		2	H
ENGG	15ECE285	Digital Signal Processing Lab.	0 0 2	1	L1
ENGG	15ECE286	Electronic Circuits Lab.	0 0 2	1	L2
HUM	15SSK221	Soft Skills I	1 0 2	2	G
HUM	15AVP211	Amrita Values Programme II	1 0 0	1	F
			Total	**22**	

Semester V

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15ECE301	Communication Theory	3 1 0	4	A
ENGG	15ECE302	Control Systems Engineering	3 1 0	4	C
ENGG	15ECE303	Linear Integrated Circuits	3 0 0	3	D
ENGG	15ECE304	Microprocessor and Microcontroller	3 1 0	4	E
SCI	15MAT303	Optimization Techniques	2 1 0	3	B
ENGG	15ECE381	Circuits and Communication Lab.	0 0 2	1	L1
ENGG	15ECE382	Microcontroller Lab.	0 0 2	1	L2
HUM	15SSK321	Soft Skills II	1 0 2	2	G
ENGG	15ECE390	Live-in-Lab**		[3]	P2
			Total	**22 [+3]**	

Semester VI

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15ECE311	Data Communication and Networks	3 0 0	3	A
ENGG	15ECE312	Digital Communication	3 1 0	4	B
ENGG	15ECE313	VLSI Design	3 0 0	3	C
ENGG	15ECE314	Computer System Architecture	3 0 0	3	D
ENGG		Elective I*	3 0 0	3	E
ENGG	15ECE385	Digital Communication Lab.	0 0 2	1	L1
ENGG	15ECE386	VLSI Design Lab.	0 0 2	1	L2
ENGG	15ECE387	Open Lab.	0 1 2	2	L3
HUM	15SSK331	Soft Skills III	1 0 2	2	G
			Total	**22**	

* A maximum of One Elective course can be chosen from the Electives prescribed for other Branches or from under Science Electives.

** Students undertaking and registering for a Live-in-Lab project, can be exempted from registering for an Elective course in the higher semester.

Semester VII

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15ECE401	Information Theory and Coding Techniques	3 1 0	4	A
ENGG	15ECE402	Radio Frequency Engineering	3 1 0	4	B
HUM	15ENV300	Environmental Science and Sustainability	3 0 0	3	H
ENGG		Elective II*	3 0 0	3	E
ENGG		Elective III*	3 0 0	3	D
ENGG	15ECE481	Microwave Engineering Lab.	0 0 2	1	L1
PRJ	15ECE495	Project Phase I		2	P1
ENGG	15ECE490	Live-in-Lab**		[3]	P2
			Total	**20 [+3]**	

Semester VIII

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG		Elective IV*	3 0 0	3	E
ENGG		Elective V*	3 0 0	3	D
PRJ	15ECE499	Project Phase II		10	P
			Total	**16**	
			TOTAL	**167**	

* A maximum of One Elective course can be chosen from the Electives prescribed for other Branches or from under Science Electives.

** Students undertaking and registering for a Live-in-Lab project, can be exempted from registering for an Elective course in the higher semester.

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ELECTIVES

COMMUNICATION

15ECE344	Antenna Systems and Design
15ECE345	Cellular and Mobile Communication System
15ECE346	Digital Telephony
15ECE347	Introduction to Radar Systems
15ECE348	Microstrip Devices and Circuits
15ECE349	Microwave Solid State Devices
15ECE350	Millimeter Wave Personal Communication System
15ECE351	MIMO and Multicarrier Systems
15ECE352	Multimedia Communication Standards
15ECE353	Optical Communication
15ECE354	Principles of RFID Design
15ECE355	Radio Frequency Circuit Design
15ECE356	Satellite Communication
15ECE357	Software Defined Radio
15ECE358	Spread Spectrum Communication
15ECE359	Wireless Communication

COMPUTER SCIENCE ENGINEERING

15CSE313	Software Engineering
15CSE330	Information Technology Essentials
15CSE374	Introduction to Data Structures and Algorithms

ANALOG ELECTRONICS

15ECE315	Biomedical Instrumentation
15ECE337	Analog and Mixed Circuit Design
15ECE338	Analog IC Design
15ECE339	Applications of Linear Integrated Circuits
15ECE340	Integrated Circuits for Biological Systems

MANAGEMENT

15ECE376	Agent-Based Modelling
15ECE377	Econometrics
15ECE378	Financial Engineering
15ECE379	Signal Processing for Business Applications
15ECE380	Telecommunication Management

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15MEC332	Enterprise Management
15MEC333	Financial Management
15MEC411	Operations Research

SIGNAL PROCESSING

15ECE320	Active Filter Design
15ECE321	Adaptive Signal Processing
15ECE322	Analog Signal Processing
15ECE323	Aviation Electronics
15ECE324	Biomedical Image Processing
15ECE325	Biomedical Signal Processing
15ECE326	Biometric Systems
15ECE327	Digital Signal Processors and Applications
15ECE328	Hyperspectral Imaging Analysis
15ECE329	Image Analysis
15ECE330	Image Processing
15ECE331	Pattern Recognition Techniques and Algorithms
15ECE332	Sparse Signal and Image Processing
15ECE333	Spoken Language Processing
15ECE334	Wavelet-based Signal Processing and Application

VLSI

15ECE363	Data Security
15ECE364	Digital IC Design
15ECE365	Electronic System Level Design and Verification
15ECE366	Embedded Systems
15ECE367	Hardware Security and Trust
15ECE368	Introduction to Soft Computing
15ECE369	Principles of VLSI Testing
15ECE370	RISC Processor Design using HDL
15ECE371	VLSI Fabrication Technology
15ECE372	VLSI Digital Signal Processing Systems
15ECE373	VLSI System Design

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SCIENCE ELECTIVES (3 0 0 3)

15CHY231	Advanced Polymer Chemistry	
15CHY232	Biomaterials Science	
15CHY233	Catalytic Chemistry	
15CHY234	Chemistry of Advanced Materials	
15CHY235	Chemistry of Engineering Materials	
15CHY236	Chemistry of Nanomaterials	
15CHY237	Chemistry of Toxicology	
15CHY238	Colloidal and Interfacial Chemistry	
15CHY239	Computational Chemistry and Molecular Modelling	
15CHY241	Electrochemical Energy Systems and Processes	
15CHY242	Environmental Chemistry	
15CHY243	Fuels and Combustion	
15CHY244	Green Chemistry and Technology	
15CHY245	Instrumental Methods of Analysis	
15CHY246	Medicinal Organic Chemistry	
15CHY247	Modern Polymer Composites	
15CHY248	Organic Reaction Mechanisms	
15CHY249	Organic Synthesis and Stereochemistry	
15CHY250	Polymer Materials and Properties	
15CHY251	Polymers for Electronics	
15CHY252	Solid State Chemistry	
15CHY331	Batteries and Fuel Cells	
15CHY332	Corrosion Science	
15PHY230	Advanced Classical Dynamics	
15PHY233	Biophysics and Biomaterials	
15PHY234	Introduction to Computational Physics	
15PHY238	Electrical Engineering Materials	
15PHY239	Electromagnetic Fields and Waves	
15PHY240	Electronic Material Sciences	
15PHY241	Lasers in Material Processing	

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15PHY243	Microelectronic Fabrication	
15PHY245	Nuclear Energy – Principles and Applications	
15PHY247	Photovoltaics	
15PHY248	Physics of Lasers and Applications	
15PHY250	Quantum Physics and Applications	
15PHY251	Thin Film Physics	
15PHY331	Astronomy	
15PHY333	Concepts of Nanophysics and Nanotechnology	
15PHY335	Medical Physics	
15PHY338	Physics of Semiconductor Devices	
15PHY532	Astrophysics	
15PHY535	Earth's Atmosphere	
15PHY536	Earth's Structure and Evolution	
15PHY540	Nonlinear Dynamics	
15PHY542	Optoelectronic Devices1	

HUMANITIES ELECTIVES

15CUL230	Achieving Excellence in Life - An Indian Perspective	2 0 0 2
15CUL231	Excellence in Daily Life	2 0 0 2
15CUL232	Exploring Science and Technology in Ancient India	2 0 0 2
15CUL233	Yoga Psychology	2 0 0 2
15ENG230	Business Communication	1 0 2 2
15ENG231	Indian Thought through English	1 0 2 2
15ENG232	Insights into Life through English Literature	1 0 2 2
15ENG233	Technical Communication	1 0 2 2
15ENG234	Indian Short Stories in English	1 0 2 2
15FRE230	Proficiency in French Language (Lower)	1 0 2 2
15FRE231	Proficiency in French Language (Higher)	1 0 2 2
15GER230	German for Beginners I	1 0 2 2
15GER231	German for Beginners II	1 0 2 2
15GER232	Proficiency in German Language (Lower)	1 0 2 2

15GER233	Proficiency in German Language (Higher)	1	0	2	2
15HIN101	Hindi I	1	0	2	2
15HIN111	Hindi II	1	0	2	2
15HUM230	Emotional Intelligence	2	0	0	2
15HUM231	Glimpses into the Indian Mind - the Growth of Modern India	2	0	0	2
15HUM232	Glimpses of Eternal India	2	0	0	2
15HUM233	Glimpses of Indian Economy and Polity	2	0	0	2
15HUM234	Health and Lifestyle	1	0	2	2
15HUM235	Indian Classics for the Twenty-first Century	2	0	0	2
15HUM236	Introduction to India Studies	2	0	0	2
15HUM237	Introduction to Sanskrit Language and Literature	2	0	0	2
15HUM238	National Service Scheme	2	0	0	2
15HUM239	Psychology for Effective Living	2	0	0	2
15HUM240	Psychology for Engineers	2	0	0	2
15HUM241	Science and Society - An Indian Perspective	2	0	0	2
15HUM242	The Message of Bhagwad Gita	2	0	0	2
15HUM243	The Message of the Upanishads	2	0	0	2
15HUM244	Understanding Science of Food and Nutrition	1	0	2	2
15JAP230	Proficiency in Japanese Language (Lower)	1	0	2	2
15JAP231	Proficiency in Japanese Language (Higher)	1	0	2	2
15KAN101	Kannada I	1	0	2	2
15KAN111	Kannada II	1	0	2	2
15MAL101	Malayalam I	1	0	2	2
15MAL111	Malayalam II	1	0	2	2
15SAN101	Sanskrit I	1	0	2	2
15SAN111	Sanskrit II	1	0	2	2
15SWK230	Corporate Social Responsibility	2	0	0	2
15SWK231	Workplace Mental Health	2	0	0	2
15TAM101	Tamil I	1	0	2	2
15TAM111	Tamil II	1	0	2	2