

B.TECH. PROGRAMME

ELECTRONICS AND INSTRUMENTATION 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 Instrumentation Engineering programme:

Humanities - 22 credits; Basic Sciences - 24 credits;
Engineering Sciences - 111 credits; Project Work - 12 credits. **Total = 169 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	15ECE112	Fundamentals of Electrical Technology	3 1 0	4	A
ENGG	15ECE111	Solid State Devices	3 0 0	3	E
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	15EIE201	Industrial Instrumentation I	3 1 0	4	A
ENGG	15ECE202	Digital Circuits and Systems	3 1 0	4	C
ENGG	15EEE202	Electric Circuits	3 1 0	4	D
SCI	15MAT204	Transforms and Partial Differential Equations	2 1 0	3	B
ENGG	15MEC205	Fluid and Thermal Engineering	3 0 2	4	E
HUM		Humanities Elective I		2	H
ENGG	15EIE281	Industrial Instrumentation I Lab.	0 0 2	1	L2
ENGG	15ECE281	Digital Circuits and Systems Lab.	0 0 2	1	L1
HUM	15AVP201	Amrita Values Programme I	1 0 0	1	F
Total			24		

Semester IV

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15EIE211	Electrical and Electronic Measurements	3 1 0	4	D
ENGG	15ECE204	Signal Processing I	3 1 0	4	C
ENGG	15ECE211	Electronic Circuits	3 1 0	4	A
SCI	15MAT212	Complex Analysis and Numerical Methods	2 1 0	3	B
HUM		Humanities Elective II		2	H
ENGG	15EIE285	Measurements 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	15EIE301	Electrical Machines	3 1 0	4	A
ENGG	15ECE212	Signal Processing II	3 1 0	4	E
ENGG	15ECE302	Control Systems Engineering	3 1 0	4	C
ENGG	15ECE303	Linear Integrated Circuits	3 0 0	3	D
SCI	15MAT214	Probability and Statistics	2 1 0	3	B
ENGG	15EIE381	Signal Processing Lab.	0 0 2	1	L2
ENGG	15ECE383	Linear Integrated Circuits Lab.	0 0 2	1	L1
HUM	15SSK321	Soft Skills II	1 0 2	2	G
ENGG	15EIE390	Live-in-Lab**		[3]	P2
Total					22 [+3]

Semester VI

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15EIE311	Industrial Instrumentation II	3 0 0	3	A
ENGG	15EIE312	Process Control	3 0 0	3	B
ENGG	15ECE304	Microprocessor and Microcontroller	3 1 0	4	C
ENGG	15ECE315	Biomedical Instrumentation	3 0 0	3	D
ENGG		Elective I*	3 0 0	3	E
ENGG	15EIE385	Process Control Lab.	0 0 2	1	L1
ENGG	15ECE382	Microcontroller Lab.	0 0 2	1	L2
ENGG	15EIE386	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	15EIE401	Data Acquisition and Communication	3 1 0	4	A
ENGG	15EIE402	Industrial Automation	3 1 0	4	B
ENGG	15EIE403	Power Electronic Devices and Circuits	3 1 0	4	C
HUM	15ENV300	Environmental Science and Sustainability	3 0 0	3	D
ENGG		Elective II*	3 0 0	3	E
ENGG	15EIE481	Industrial Automation Lab.	0 0 2	1	L1
PRJ	15EIE495	Project Phase I		2	P1
ENGG	15EIE490	Live-in-Lab**		[3]	P2
Total					21 [+3]

Semester VIII

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG		Elective III*	3 0 0	3	E
ENGG		Elective IV*	3 0 0	3	D
PRJ	15EIE499	Project Phase II		10	P
Total					16

TOTAL 169

* 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.

ELECTIVES**SIGNAL PROCESSING**

15ECE320	Active Filter Design
15ECE321	Adaptive 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/ANALOG ELECTRONICS

15ECE313	VLSI Design
15ECE337	Analog and Mixed Circuit Design
15ECE338	Analog IC Design
15ECE339	Applications of Linear Integrated Circuits
15ECE340	Integrated Circuits for Biological Systems
15ECE364	Digital IC Design
15ECE365	Electronic System Level Design and Verification
15ECE366	Embedded Systems
15ECE368	Introduction to Soft Computing
15ECE369	Principles of VLSI Testing
15ECE371	VLSI Fabrication Technology
15ECE373	VLSI System Design

COMPUTER SCIENCE

15CSE313	Software Engineering
15CSE330	Information Technology Essentials
15CSE374	Introduction to Data Structures and Algorithms
15ECE314	Computer System Architecture

INSTRUMENTATION AND CONTROL

15EIE330	Advanced Process Control
15EIE331	Digital Control and State Variable Methods
15EIE332	Embedded Systems for Instrumentation
15EIE333	Fibreoptics and Laser Instrumentation
15EIE334	Instrumentation Project Management and System Design
15EIE335	Intelligent Control Systems
15EIE336	Sensors and Signal Conditioning
15EIE337	Virtual Instrumentation

MANAGEMENT

15ECE376	Agent-based Modelling
15ECE377	Econometrics
15ECE378	Financial Engineering
15ECE379	Signal Processing for Business Applications
15MEC332	Enterprise Management
15MEC333	Financial Management
15MEC411	Operations Research

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

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 Devices

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

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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