B.Tech. Programme

Civil 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 Civil Engineering programme:

Humanities - 22 credits; Basic Sciences - 27 credits;
Engineering Sciences - 104 credits; Project Work - 14 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	15CVL111	Introduction to Civil Engineering	1 0 0	1	A
ENGG	15CVL102	Mechanics: Statics and Dynamics	2 1 0	3	E
ENGG	15CSE102	Computer Programming	3 0 0	3	D
ENGG	15CSE180	Computer Programming Lab.	0 0 2	1	L3
ENGG	15CVL112	Engineering Graphics - CAD	1 0 2	2	G
SCI	15CHY181/ 15PHY181	Chemistry Lab. / Physics Lab.	0 0 2	1	L1
ENGG	15EEE180/ 15MEC180	Workshop B/ Workshop A	0 0 2	1	L2
HUM	15CUL111	Cultural Education II	2 0 0	2	F
			Total	**21**	

Semester   III

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15CVL201	Construction Materials	3 0 0	3	A
ENGG	15CVL202	Principles of Fluid Mechanics	2 1 0	3	C
ENGG	15CVL203	Solid Mechanics	3 1 0	4	D
ENGG	15CVL204	Surveying	3 1 0	4	G
SCI	15MAT204	Transforms and Partial Differential Equations	2 1 0	3	B
HUM		Humanities Elective I	2 0 0	2	H
ENGG	15CVL281	Material Testing Lab.	0 0 2	1	L1
ENGG	15CVL282	Survey Practice	1 0 2	2	L2
HUM	15 AVP201	Amrita Values Programme I	1 0 0	1	F
			Total	**23**	

Semester   IV

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15CVL211	Building Technology	3 0 0	3	A
ENGG	15CVL212	Geology and Soil Mechanics	2 1 0	3	C
ENGG	15CVL213	Hydraulic Engineering	2 1 0	3	D
ENGG	15CVL214	Structural Analysis	2 1 0	3	E
SCI	15MAT212	Complex Analysis and Numerical Methods	2 1 0	3	B
HUM		Humanities Elective II	2 0 0	2	H
ENGG	15CVL285	Construction Materials Lab.	0 0 2	1	L1
ENGG	15CVL286	Hydraulic Engineering 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	15CVL301	Advanced Structural Analysis	2 1 0	3	A
ENGG	15CVL302	Design of Concrete Structures	3 1 0	4	C
ENGG	15CVL303	Geotechnical Engineering	3 1 0	4	E
HUM	15ENV300	Environmental Science and Sustainability	3 0 0	3	D
SCI	15MAT214	Probability and Statistics	2 1 0	3	B
ENGG	15CVL381	Building Drawing	1 0 2	2	L2
ENGG	15CVL382	Geotechnical Engineering Lab.	0 0 2	1	L1
HUM	15SSK321	Soft Skills II	1 0 2	2	G
ENGG	15CVL390	Live-in-Lab**		[3]	P2
			Total	**22 [+3]**	

Semester   VI

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG	15CVL311	Design of Steel Structures	3 1 0	4	A
ENGG	15CVL312	Environmental Engineering I	2 1 0	3	B
ENGG	15CVL385	Environmental Engineering Lab.	0 0 2	1	L1
ENGG	15CVL386	Estimation and Valuation Practice	1 0 2	2	L2
ENGG	15CVL313	Transportation Engineering I	2 1 0	3	C
ENGG	15CVL314	Water Resources and Irrigation Engineering	3 1 0	4	D
SCI		Science Elective	2 1 0	3	H
HUM	15SSK331	Soft Skills III	1 0 2	2	G
			Total	**22**	

** 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	15CVL401	Construction Management	3 1 0	4	A
ENGG	15CVL402	Environmental Engineering II	2 1 0	3	B
ENGG	15CVL481	Structural Design and Detailing	0 0 2	1	L1
ENGG	15CVL403	Transportation Engineering II	2 1 0	3	C
ENGG		Elective I	2 1 0	3	E
ENGG		Elective II	2 1 0	3	D
PRJ	15CVL490	Professional Project	0 1 2	2	P2
PRJ	15CVL495	Project Phase I		2	P1
ENGG	15CVL490	Live-in-Lab**		[3]	P3
			Total	**21 [+3]**	

Semester   VIII

Cat.	Code	Course Title	L-T-P	Cr	ES
ENGG		Elective III	2 1 0	3	E
ENGG		Elective IV / Open Elective*	2 1 0	3	D
PRJ	15CVL499	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.

ELECTIVES

STRUCTURAL ENGINEERING

15CVL430	Advanced Concrete Design
15CVL431	Advanced Mechanics of Materials
15CVL432	Advanced Steel Design
15CVL433	Bridge Engineering
15CVL434	Computer Methods of Structural Analysis
15CVL435	Finite Element Methods
15CVL436	Industrial Structures
15CVL437	Smart Materials and Structures
15CVL438	Structural Dynamics and Seismic Design

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

15CVL440	Advanced Surveying
15CVL441	Architectural Science
15CVL442	Concrete Technology
15CVL443	Construction Economics and Finance
15CVL444	Distress Monitoring and Repair of Structures
15CVL445	Sustainable Construction

GEOTECHNICAL ENGINEERING

15CVL450	Advanced Foundation Engineering
15CVL451	Earth Retaining Structures
15CVL452	Environmental Geotechnology
15CVL453	Ground Improvement Techniques

WATER RESOURCES ENGINEERING

15CVL455	Ground Water Hydrology
15CVL456	Remote Sensing and GIS
15CVL457	Surface Water Hydrology and Hydro Power
15CVL458	Water Resources System Planning and Design

ENVIRONMENTAL ENGINEERING

15CVL460	Advanced Environmental Engineering
15CVL461	Environmental Impact Assessment
15CVL462	Industrial Waste Treatment

TRANSPORTATION ENGINEERING

15CVL470	Pavement Design
15CVL471	Traffic Engineering and Management
15CVL472	Transportation System Management and Control
15CVL473	Urban Transportation Planning

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 (1 0 2 2)

15CUL230	Achieving Excellence in Life - An Indian Perspective
15CUL231	Excellence in Daily Life
15CUL232	Exploring Science and Technology in Ancient India
15CUL233	Yoga Psychology
15ENG230	Business Communication
15ENG231	Indian Thought through English
15ENG232	Insights into Life through English Literature
15ENG233	Technical Communication
15ENG234	Indian Short Stories in English
15FRE230	Proficiency in French Language (Lower)
15FRE231	Proficiency in French Language (Higher)
15GER230	German for Beginners I
15GER231	German for Beginners II
15GER232	Proficiency in German Language (Lower)
15GER233	Proficiency in German Language (Higher)

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