

# B.TECH. PROGRAMME

## COMPUTER SCIENCE AND ENGINEERING

### CURRICULUM

**for 2010 admissions  
onwards**

#### GENERAL INFORMATION

In this section, category-wise distribution of credits for B.Tech (Computer Science and Engineering) program for all semesters are given, followed by curriculum.

#### Code Numbering

Each course is assigned a code number consisting of two letters followed by three digits. The two-letter code indicates the department offering the course. The digit code indicates the level of the course (100,200,300,400 etc..). The odd number indicates courses offered in odd semesters and even number indicates courses offered in even semesters. When a subject is offered in both even and odd semesters, the digit code ends with a zero. Generally Elective courses begin with \* 51 and lab courses begin with \*90. Courses in humanity subjects (except language) are offered by any department where expertises are available.

#### ABBREVIATIONS

##### Curriculum

L	-	Lecture	H	-	Humanities
T	-	Tutorial	S	-	Science
P	-	Practical	M	-	Mathematics
Cr	-	Credit	G	-	General Engg.
Cat	-	Category	C	-	Core Engg.
ES	-	Exam Slot	Pr	-	Project

##### Departments

AES	-	Aerospace Engineering
CHE	-	Chemical Engineering
CHY	-	Chemistry
CSE	-	Computer Science and Engineering
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

**B Tech Programme**  
**COMPUTER SCIENCE AND ENGINEERING**  
**REVISED CURRICULUM**  
**(2010 admissions onwards)**

**SEMESTER I:**

Cat.	Code	Course Title	L-T-P	Cr	ES
H	ENG111	Communicative English	2 0 2	3	G
S	PHY100/ CHY100	Physics/ Chemistry	3 0 0	3	B
M	MAT111	Calculus, Matrix Algebra and Ordinary Differential Equations	3 1 0	4	A
G	EEE100	Electrical Engineering	3 0 0	3	C
G	MEC100/ CSE100	Engineering Mechanics/ Computer Programming	3 1 0 3 0 0	4 3	D
G	MEC181	Engineering Drawing	1 0 3	2	-
S	PHY181/ CHY181	Physics Lab./ Chemistry Lab.	0 0 3	1	-
G	MEC180/ EEE180	Workshop A/ Workshop B	1 0 2	2	-
G	CSE180	Computer Programming Lab.	0 0 3	1	-
H	CUL101	Cultural Education I	2 0 0	2	H

**H = 5 S = 4 M = 4 G = 11****Total = 24****SEMESTER II:**

Cat.	Code	Course Title	L-T-P	Cr	ES
H	ENG112	Technical Communication	2 0 2	3	G
S	CHY100/ PHY100	Chemistry/ Physics	3 0 0	3	B
M	MAT112	Vector Calculus, Fourier Series and Partial Differential Equations	3 1 0	4	A
G	ECE100	Electronics Engineering	3 0 0	3	C
G	CSE100/ MEC100	Computer Programming/ Engineering Mechanics	3 0 0 3 1 0	3 4	D
G	MEC182	Computer Aided Drawing	1 0 3	2	-
S	CHY181/ PHY181	Chemistry Lab./ Physics Lab.	0 0 3	1	-
G	EEE180/ MEC180	Workshop B/ Workshop A	1 0 2	2	-
G	CSE180	Computer Programming Lab.	0 0 3	1	-
H	CUL102	Cultural Education II	2 0 0	2	H

**H = 5 S = 4 M = 4 G = 11****Total = 24**

**III Semester**

Cat.	Code	Course Title	L-T-P	Cr	ES
M	MAT211	Integral Transforms and Complex Analysis	3 1 0	4	A
C	MAT220	Discrete Mathematics	3 1 0	4	F
C	CSE220	Object Oriented Programming	3 1 0	4	E
C	ECE210	Digital Systems	3 1 0	4	C
H	ENV200	Environmental Studies	3 1 0	4	D
H		Humanities Elective I	1 0 2	2	H
C	CSE290	Object Oriented Programming Lab.	0 0 3	1	-
C	ECE290	Digital Systems Lab.	0 0 3	1	-

**M = 4 H = 6 C = 14****Total = 24****IV Semester**

Cat.	Code	Course Title	L-T-P	Cr	ES
M	MAT212	Mathematical Statistics and Numerical Methods	3 1 0	4	A
C	CSE210	Computer Organisation and Architecture	3 1 0	4	D
C	CSE221	Structure and Interpretation of Computer Programs	3 1 0	4	E
C	CSE230	Data Structures	3 1 0	4	F
C	ECE212	Introduction to Embedded Systems	3 1 0	4	C
H		Humanities Elective II	1 0 2	2	H
C	CSE291	Data Structures Lab.	0 0 3	1	-
C	ECE294	Embedded Systems Lab.	0 0 3	1	-
H	SSK111	SOFT SKILLS I	0 0 3	1	-

**M = 4 H = 3 C = 18****Total = 25****V Semester**

Cat.	Code	Course Title	L-T-P	Cr	ES
C	CSE300	Operating Systems	3 1 0	4	C
C	CSE330	Design and Analysis of Algorithms	3 1 0	4	D
C	CSE340	Database Management Systems	3 1 0	4	E
C	ECE300	Introduction to Digital Signal Processing	3 0 0	3	F
S		Science Elective I	3 0 0	3	B
C	CSE390	Java Programming	0 0 3	1	-
C	CSE391	Database Management Systems Lab.	0 0 3	1	-
C	CSE392	Operating Systems Lab.	0 0 3	1	-
H	SSK112	SOFT SKILLS II	0 0 3	1	-

**S = 3 H = 1 C = 18****Total = 22****VI Semester**

Cat.	Code	Course Title	L-T-P	Cr	ES
C	CSE310	Computer Networks	3 1 0	4	C
C	CSE320	Software Engineering	3 1 0	4	D
C	CSE331	Formal Languages and Automata	3 1 0	4	E
C		Elective I	3 0 0	3	F
S		Science Elective II	3 0 0	3	B
C	CSE393	Software Engineering Lab.	0 0 3	1	-
C	CSE394	Computer Networks Lab.	0 0 3	1	-
H	SSK113	SOFT SKILLS III	0 0 3	1	-

**S = 3 H = 1 C = 17****Total = 21**

**VII Semester**

Cat.	Code	Course Title	L-T-P	Cr	ES
C	CSE400	Computer Graphics and Visualisation	3 1 0	4	B
C	CSE421	Net-centric Programming	3 1 0	4	D
C	CSE430	Computer Language Engineering	3 1 0	4	E
C		Elective II	3 0 0	3	F
H	MNG400	Principles of Management	3 0 0	3	C
C	CSE490	Computer Graphics and Visualisation Lab.	0 0 3	1	-
C	CSE491	Computer Language Engineering Lab.	0 0 3	1	-
Pr	CSE497	Seminar	0 0 3	1	-

**H = 3 C = 17 Pr = 1****Total = 21****VIII Semester**

Cat.	Code	Course Title	L-T-P	Cr	ES
C		Elective III	3 0 0	3	F
H		Management Elective	3 0 0	3	C
Pr	CSE499	Project		10	-

**H = 3 C = 3 Pr = 10****Total = 16****Total credits for the programme = 177****ELECTIVES****COMPUTATIONAL INTELLIGENCE / DATABASE TECHNOLOGIES /****IMAGE ANALYSIS**

CSE351	Advanced Databases
CSE352	Pattern Recognition
CSE353	Soft Computing
CSE354	Agent-based Intelligent Systems
CSE451	Computational Finance
CSE452	Multimedia Databases
CSE453	Natural Computing
CSE454	Principles of Digital Image Processing
CSE455	Data Warehousing and Data Mining
CSE456	Information Retrieval
CSE457	Business Intelligence
CSE458	Computer Vision

**EMBEDDED SYSTEMS / NETWORKING / SECURITY**

CSE361	High Performance Computing
CSE362	Cryptography
CSE363	Real-time Computing Systems
CSE460	Computer Systems Engineering
CSE461	Information Security
CSE462	Wireless and Mobile Communication
CSE463	Information Coding Techniques
CSE464	Embedded Programming
CSE465	Parallel and Distributed Computing
ECE370	Introduction to VLSI Design

**SOFTWARE DEVELOPMENT / GENERAL**

CSE371	Visual Programming
CSE471	Free and Open Source Software
CSE472	Data Compression
CSE473	Software Quality Assurance
CSE474	Component Based Development
CSE475	Natural Language Processing
CSE476	Bioinformatics

**MANAGEMENT ELECTIVES**

CSE481	Management Information Systems
CSE482	Software Project Management
CSE483	Electronic Commerce
MEC401	Operations Research
MEC482	Financial Management

**SCIENCE ELECTIVES (3 0 0 3)**

CHY250	Catalytic Chemistry
CHY251	Chemistry of Engineering Materials
CHY252	Chemistry of Advanced Materials
CHY253	Advanced Polymer Chemistry
CHY254	Polymers for Electronics
CHY255	Chemistry of Toxicology
CHY256	Chemistry of Nanomaterials
CHY257	Biomaterials Science
CHY258	Environmental Chemistry
CHY259	Instrumental Methods of Analysis
CHY260	Organic Synthesis and Stereochemistry
CHY261	Unit Processes in Organic Synthesis
CHY262	Medicinal Organic Chemistry
CHY263	Organic Reaction Mechanisms
CHY264	Green Chemistry and Technology
CHY270	Corrosion Science
CHY271	Electrochemical Energy Systems and Processes
CHY272	Computational Chemistry and Molecular Modelling
CHY273	Fuel Cells – Principles and Applications
CHY274	Solid State Chemistry
PHY250	Electrical Engineering Materials
PHY251	Optoelectronic Devices
PHY252	Physics of Semiconductor Devices
PHY253	Electromagnetic Fields and Waves
PHY254	Microelectronic Fabrication
PHY255	Electronic Materials Science
PHY260	Physics of Lasers and Applications
PHY261	Lasers in Material Processing
PHY262	Non-linear Dynamics
PHY263	Concepts of Nanophysics and Nanotechnology
PHY264	Thin Film Physics
PHY270	Medical Physics
PHY271	Advanced Classical Dynamics
PHY272	Quantum Physics and its Applications
PHY273	Computational Physics
PHY274	Astrophysics

**HUMANITIES ELECTIVES (1 0 2 2)**

CUL151	Achieving Excellence in Life – An Indian Perspective
CUL152	Exploring Science and Technology in Ancient India
CUL153	Excellence in Daily Life
CUL154	Yoga Psychology
ENG250	Professional Communication
ENG251	Business Communication
ENG252	Indian Thought in English
ENG253	Insights into Life through English Literature
FRE201	Proficiency in French Language (Lower)
FRE202	Proficiency in French Language (Higher)
GER201	Proficiency in German Language (Lower)
GER202	Proficiency in German Language (Higher)
GER211	German for Beginners I
GER212	German for Beginners II
HUM250	Indian Classics for the Twenty-first Century
HUM251	Introduction to India Studies
HUM252	Glimpses of Eternal India
HUM253	Glimpses into the Indian Mind – The Growth of Modern India
HUM254	Glimpses of Indian Economy and Polity
HUM255	Science and Society – An Indian Perspective
JAP201	Proficiency in Japanese Language (Lower)
JAP202	Proficiency in Japanese Language (Higher)