

**SCHEME OF STUDY FOR B.TECH.(COMPUTER SCIENCE)**

**Overall Credit Structure**

Category	Credits
Basic Sciences + Engineering Sciences (Credits from 1 <sup>st</sup> Year)	78
CSE DC credits	152
CSE DE credits	78-90
Humanities	0
OC	0-12
<b>Total</b>	<b>320</b>

**Notes:**

1. Given below is scheme for 3<sup>rd</sup> semester to 8<sup>th</sup> semester BTech, Computer Science Engg.
2. As per the scheme the course on “Technical Communication”, offered by Humanities department in the 6<sup>th</sup> semester is compulsory. In view of this, credits for other Humanities courses in the scheme is 0 (zero).
3. Credits that can be earned out of OC courses during 3<sup>rd</sup> to 8<sup>th</sup> semester are 0-12. To earn these 0-12 credits during 3<sup>rd</sup> – 8<sup>th</sup> semester, a student can register for, at maximum, 2 OC courses.
4. A student may decide to register for lesser number any OC courses, in that case he/she will cover remaining of the 12 OC credits from DE courses.
5. There are 3 slots provided for OC courses in the scheme below, one each in 3<sup>rd</sup>, 7<sup>th</sup> and 8<sup>th</sup> semester. If a student wishes to register for OC course, he/she can do it *one OC course per semester **only in** (one or two of) **these three semesters***.
6. If a student does not register for an OC course in a particular semester allotted for OC (i.e. in 3<sup>rd</sup>, 7<sup>th</sup> or 8<sup>th</sup> semester), he/she has to compensate for these 6 credits by registering for a DE course **in the same semester**. For example, if a student does not register for OC course in 3<sup>rd</sup> semester, he/she will have to register for a DE course (for e.g. Analog Circuits) **in the same semester**, so that total credits earned in any particular semester is maintained.
7. A student should register for at-least 60 credits, from DE/OC courses in 7<sup>th</sup> and 8<sup>th</sup> semester together. This requires a student to cover at-least 36 credits from DE/OC courses in the 7<sup>th</sup> semester. More details given below.

Semester III

Course Code	Course Title	Credits	Cat.	L-T-P
MAL 205	Numerical Analysis and Probability Theory (NAPT)	6	DC	3-0-0
ECL 2xx	Digital Circuits and Logic Design	6	DC	3-0-0
EEL 2xx	Electrical Sciences	6	DC	3-0-0
CSL 2xx	Discrete Mathematics and Graph Theory	8	DC	3-1-0
CSL 2xx	Data Structures and Program Design I	8	DC	3-0-2
CSP2xx	Software-Lab-I	2	DC	0-0-2
ECL 2xx	Analog Circuits	6	DE	3-0-0
	OC (Open Course)	6	OC	3-0-0
<b>Current-Sem</b>	DC: 36; DE+ OC: 6 ( 1 of 2)	42		

<b>Cumulative</b>	DC: 36; DE+ OC: 6;	42
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Semester IV

Course Code	Course Title	Credits	Cat.	L-T-P
CSL 2xx	Computer Organization	6	DC	3-0-0
MAL 2xx	Linear Algebra and Applications	6	DC	3-0-0
CSL 2xx	Data Structures and Program Design II	8	DC	3-0-2
CSL 2xx	Concepts in Programming Languages	8	DC	3-0-2
CSL 2xx	Microprocessor-based Systems	8	DC	3-0-2
EEL 2xx	Control Systems	6	DE	3-0-0
ECL 2xx	Signals and Systems	6	DE	3-0-0
<b>Current-Sem</b>	DC: 36; DE: 6 (1 of 2);	42		

<b>Cumulative</b>	DC: 72; DE + OC : 12;	84
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**Note for Even Semester registration:**

1. Students of 2010 entry batch and earlier, who have not cleared, as yet,
  - a. Integral-Transforms and Partial Differential Equations”

OR / AND

- b. Physics-2

must register for “Linear Algebra” so as to meet their DC credit requirements.

Scheme of study: B.Tech. (CSE), Year of Admission - 2011

Semester V

Course Code	Course Title	Credits	Cat.	L-T-P
CSL 3xx	Theory of Computation	6	DC	3-0-0
CSL 3xx	Operating Systems	6	DC	3-0-0
CSL 3xx	Analysis of Algorithms	6	DC	3-0-0
CSL 3xx	Introduction to OO Methodology	8	DC	3-0-2
CSP 3xx	Software Lab II	2	DC	0-0-2
CSL 3xx	System Programming	8	DC	3-0-2
CSL 3xx	Neurofuzzy Techniques	6	DE	3-0-0
CSL 3xx	Computer Graphics	6	DE	3-0-0
<b>Current-Sem</b>	DC: 36; DE: 6 (1 of 2)	42		

<b>Cumulative</b>	DC:108 ; DE + OC: 18 ;	126
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Semester VI

Course Code	Course Title	Credits	Cat.	L-T-P
CSL 3xx	Database Management Systems	8	DC	3-0-2
CSL 3xx	Language Processors	8	DC	3-0-2
CSL 3xx	Software Engineering	6	DC	3-0-0
CSL 3xx	Computer Networks	8	DC	3-0-2
HUL 3xx	Technical Communication	6	DE	3-0-0
CSL 3xx / CSL3xx	Business Information Systems(BIS)/ Internet Technologies (1 of 2)	6	DE	3-0-0
<b>Current-Sem</b>	DC: 30; DE: 12 (2 of 3)	42		

<b>Cumulative</b>	DC:138 ; DE + OC : 30;	168
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Note-

1. BIS and Internet Technology are grouped together and only one of this group can be registered by a student.

Semester VII

Course Code	Course Title	Credits	Cat.	L-T-P
CSD 4xx	Project Phase I	4	DC	
CSP4xx	Software Lab – III	2	DC	0-0-2
CSL 4xx	Topics in Embedded Systems	6	DE	3-0-0
CSL 4xx	Artificial Intelligence	8	DE	3-0-2
CSL5xx**	Advances in Compilers	8	DE	3-0-2
CSL5xx**	Pattern Recognition	8	DE	3-0-2
CSL4xx	Fundamental Algorithms in Computational Biology	6	DE	3-0-0
CSL4xx	Information Retrieval	6	DE	3-0-0
CSL5xx	Formal Methods in Program Design	6	DE	3-0-0
CSL5xx**	Advanced Computer Architecture	6	DE	3-0-0
CSL4xx	Paradigms in Programming	6	DE	3-0-0
ECL4xx	Digital Signal Processing	6	DE	3-0-0
	OC (Open Course)	6	OC	3-0-0
<b>Current-Sem</b>	DC:6 ; DE+ OC : 36-42 (5/6 out of 11)	42-48		

<b>Cumulative</b>	DC:144 ; DE+ OC : 66-72	210-216
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Notes for 7<sup>th</sup> semester –

1. *Minimum 36 DE+OC credits must be earned* in 7<sup>th</sup> semester.
2. *Maximum* DE credits that can be earned in 7<sup>th</sup> semester are 42 (by taking 3 courses of 8 credits each and 3 courses of 6 credits each).
3. \*\*The courses for MTech (CSE), viz ‘Advances in Compilers’, ‘Pattern Recognition’, ‘Advanced Computer Architecture’ and ‘Formal Methods in Program Design’ are 5-level courses, those will be offered as electives for final year BTech students. The pre-requisites are as follows :
  - a. Advances in Compilers : pre-requisite - CSL3xx Language Processors
  - b. Pattern Recognition : pre-requisite –
    - i. CSL2xx : Linear Algebra and Applications
    - ii. CSL2xx : Numerical Analysis and Probability Theory
  - c. Advanced Computer Architecture : pre-requisite – CSL2xx : Computer Organization
  - d. Formal Methods in Program Design : pre-requisite –
    - i. Data Structures and Program Design –II

In addition, the instructors for these courses may announce additional criteria for students wishing to register for these. The criteria may be based on grades scored in pre-requisite courses, overall CGPA or any other criteria and/or a combination of different criteria, that can be announced before registration.

Semester VIII

Course Code	Course Title	Credits	Cat.	L-T-P
CSD 4xx	Project Phase II	8	DC	
CSL 4xx	Network Security	6	DE	3-0-0
CSL 4xx	Data Mining and Data Warehousing	6	DE	3-0-0
CSL 4xx	Topics in Graph Theory	6	DE	3-0-0
CSL 4xx	Topics in Distributed Systems	6	DE	3-0-0
CSL 4xx	Software Project Management	6	DE	3-0-0
CSL4xx	Human Computer Interface	6	DE	3-0-0
MAL407	Statistics and OR	6	DE	3-0-0
PHY4xx	Quantum Computation and Quantum Information	6	DE	3-0-0
CSL 4xx	Enterprise Resource Planning	6	DE	3-0-0
CSL 4xx	Business Intelligence	6	DE	3-0-0
CSL4xx	Introduction to Cloud Computing	6	DE	3-0-0
CSL 5xx **	Software Architecture	6	DE	3-0-0
CSL 5xx **	Topics in Bioinformatics	6	DE	3-0-0
	OC	6	OC	3-0-0
<b>Current-Sem</b>	DC: 8 ; DE + OC: 18-24 (3/4 out of 14)	34-40		

<b>Cumulative</b>	DC: 152 ; DE + OC: 90	242
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Notes for 8<sup>th</sup> semester-

1. A student should cover a total of 60 DE+OC credits in 7<sup>th</sup> + 8<sup>th</sup> semester, together.
2. A student may opt for lesser number of courses in DE+OC category (3 instead of 4) in 8<sup>th</sup> semester, in case his requirement of DE credits gets fulfilled. For example, if a student has covered 42 DE credits in 7<sup>th</sup> semester, he/she has to register for DE/OC courses so as to cover minimum of 18 credits. On the other hand, a student covering 36 DE credits in 7<sup>th</sup> semester will have to cover 24 DE credits in 8<sup>th</sup> semester.
3. \*\* - These are M.Tech. level courses, that can be made available to B.Tech. students on the need basis. The prerequisite courses are as follows
  - a. Software Architecture –
    - i. CSL3xx Software Engineering,
    - ii. CSL3xx Introduction to OO Methodology
  - b. Topics in Bioinformatics –
    - i. CSL2xx – Discrete Mathematics and Graph Theory
    - ii. CSL3xx – Analysis of Algorithms

The instructors for these courses may announce additional criteria for students wishing to register for these courses. The criteria may be based on grades scored in pre-requisite courses (as applicable), overall CGPA or any other criteria and/or a combination of different criteria that can be announced before registration.