
**UNDERGRADUATE DEGREE COURSES IN
COMPUTER SCIENCE & ENGINEERING**

(Engineering & Technology)

[Proposed Syllabus – 2021
onwards]

**Dibrugarh, Assam-
786004India**

**All India Council for Technical
Education Model curriculum for
Undergraduate Degree Courses in Engineering &
Technology COMPUTERSCIENCE AND ENGINEERING**

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All India Council for Technical Education
Model curriculum
for Undergraduate Degree Courses in Engineering & Technology

COMPUTER SCIENCE AND ENGINEERING

Chapter-1
General, Course structure &
Theme &
Semester-wise credit distribution

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credit
2 Hours Practical (Lab) / week	1 credit

B. Range of credits- A student will be eligible to get Graduate degree in Engineering, if he/she completes 162 credits. A student will be eligible to get Under Graduate degree with Honours, if he/she completes an additional 20 credits. These could be acquired through MOOCs.

C. Structure of Undergraduate Engineering program:

S. No.	Category	Credit Breakup for CSE students
1	Humanities and Social Sciences including Management courses	12
2	Basic Science courses	22
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	24
4	Professional core courses	58
5	Professional Elective courses relevant to chosen specialization/branch	18
6	Open subjects – Electives from other technical and/or emerging subjects	12
7	Project work, seminar and internship in industry or elsewhere	20
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution]	(non-credit)
	Total	166

**Minor variation is allowed as per need of the respective disciplines.*

D. Credit distribution in the First year of Undergraduate Engineering program:

	Lecture	Tutorial	Laboratory/Practical	Total credits
Chemistry-I	3	1	3	5.5
Physics	3	1	3	5.5
Maths-1	3	1	0	4
Maths-2	3	1	0	4
Programming for Problem solving	3	0	4	5
English	2	0	2	3
Engineering Graphics & Design	1	0	4	3
Workshop/ Practical	1	0	4	3
Basic Electrical Engg.	3	1	2	5
*Maths-3	3	1	0	4

**These courses may be offered preferably in the later semesters*

E. Course code and definition:

Course code	Definitions
BSC	Basic Science Courses
ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management courses
CSE	Professional core courses
CSE-ELV	Professional Elective courses
CSE-O-ELV	Open Elective courses
MC	Mandatory courses

HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES

Sl.No	CodeNo.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	HSMC101	English	2	0	2	3	1
2	HSMC201	Managerial Economics	3	0	0	3	4
3	HSMC302	Management and Accountancy	3	1	0	4	5
4	HSMC222	Technical English for Engineers	0	0	4	2	4
Total Credits:						12	

BASIC SCIENCE COURSE [BSC]

Sl.No	CodeNo.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	BSC101	Physics (Semi-conductor Physics)	3	1	3	5.5	1
2	BSC201	Mathematics-II (Probability and Statistics)	3	1	0	4	2
3	BSC102	Mathematics-I (Calculus and Linear Algebra)	3	1	0	4	1
4	BSC202	Chemistry-I	3	1	3	5.5	2
5	BSC301	Mathematics-III (Differential Calculus)	2	0	0	2	3
Total Credits:						21	

ENGINEERING SCIENCE COURSE [ESC]

Sl.No	CodeNo.	CourseTitle	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	ESC101	Basic Electrical Engineering	3	1	2	5	1
2	ESC102	Engineering Graphics & Design	1	0	4	3	1
3	ESC201	Programming for Problem Solving	3	0	4	5	2
4	ESC202	Workshop/Manufacturing Practices	1	0	4	3	2
5	ESC302	Digital Electronics	3	0	4	5	4
6	ESC501	Signals and Systems	3	0	0	3	5
Total Credits:						24	

PROFESSIONAL CORE COURSES [PCC]

Sl. No	CodeNo.	CourseTitle	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-301	Programming Language	2	0	4	4	3
2	CSE-302	Data Structure & Algorithms	3	0	4	5	3
3	CSE-313	Software tools	0	0	6	3	3
4	CSE-304	Computer Organization and Architecture	3	0	4	5	3
5	CSE-401	Discrete Mathematics	3	1	0	4	4
6	CSE-402	Operating Systems	3	0	4	5	4
7	CSE-403	Object Oriented Programming	2	0	4	4	4
8	CSE-404	Database Management Systems	3	0	4	5	4
9	CSE-501	Design and Analysis of Algorithms	3	0	4	5	5
10	CSE-502	Computer Network-I	3	0	4	5	5
11	CSE-503	Formal Language, Automata and Compiler	3	0	0	3	5

12	CSE-601	Compiler Design	3	0	4	5	6
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13	CSE-602	Computer Networks-II	3	0	4	5	6
Total Credits						58	

PROFESSIONAL ELECTIVE [PEC]

Sl.No	CodeNo.	CourseTitle	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-ELV-501	Elective- I	3	0	0	3	5
2	CSE-ELV-601	Elective-II	3	0	0	3	6
3	CSE-ELV-602	Elective-III	3	0	0	3	6
4	CSE-ELV-701	Elective-IV	3	0	0	3	7
5	CSE-ELV-702	Elective-V	3	0	0	3	7
6	CSE-ELV-801	Elective-VI	3	0	0	3	8
Total Credits						18	

OPEN ELECTIVE COURSES [OEC]

Sl.No	CodeNo.	CourseTitle	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-O-ELV-601	Open Elective-I	3	0	0	3	6
2	CSE-O-ELV-701	Open-Elective-II	3	0	0	3	7
3	CSE-O-ELV-801	Open-Elective-III	3	0	0	3	8
4	CSE-O-ELV-802	Open-Elective-IV	3	0	0	3	8
Total Credits:						12	

**4 year Curriculum
structure Undergraduate Degree in Engineering & Technology**

**Branch / course: Computer Science and
Engineering Total credits (4 year course
): 162**

I. Induction Program (Please refer Appendix-A for guidelines)

Induction program (mandatory)	3 weeks duration (Please refer Appendix-A for guidelines & also details available in the curriculum of Mandatory courses)
Induction program for students to be offered right at the start of the first year.	<ul style="list-style-type: none"> • Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch & Innovations

II Semester-wise structure of curriculum

[L=Lecture, T=Tutorials, P=Practical's & C=Credits]

Semester I (First year) Curriculum Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Course Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Basic Science course	BSC103	Mathematics-I	3	1	0	4
2	Engineering Science Course	ESC102	Engg. Graphics & Design	0	0	4	2
3	Engineering Science Course	ESC101	Basic Electrical Engineering	3	1	0	4
4	Engineering Science Course	ESC111	Basic Electrical Engineering Laboratory	0	0	2	1
5	Engineering Science Course	ESC104	Workshop	1	0	4	3
6	Humanities & Social Sciences including Management courses	HSMC101	English	2	0	0	2
7	Humanities & Social Sciences including Management courses	HSMC111	English	0	0	2	1
Total credits							17

Semester II (First year]
Curriculum Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Basic Science course	BSC102	Chemistry-I	3	1	0	4
2	Basic Science course	BSC112	Chemistry-II Laboratory	0	0	3	1.5
3	Basic Science course	BSC101	Physics-I	3	1	0	4
4	Basic Science course	BSC111	Physics-II Laboratory	0	0	3	1.5
3	Basic Science course	BSC104	Mathematics-II (Probability and Statistics)	3	1	0	4
4	Engineering Science Course	ESC103	Programming for Problem Solving	3	0	0	3
4	Engineering Science Course	ESC113	Programming for Problem Solving Laboratory	0	0	4	2
5	Engineering Science Course	ESC112	Computer Aided Drawing	0	0	2	1
Total credits							21

Semester III (Second year]
Curriculum Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE301	Principles of Programming Language	3	0	0	3
2	Professional Core Courses	CSE-302	Data structure & Algorithms	3	0	0	3
3	Professional Core Courses	CSE-312	Data structure & Algorithms Laboratory	0	0	4	2
4	Engg. Science Course	ESC301	Digital Electronics	3	0	0	3

5	Engg. Science Course	ESC311	Digital Electronics Laboratory	0	0	4	2
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6	Professional Core Courses	CSE-313	Software tools	0	0	4	2
7	Basic Science course	BSC301	Mathematics-III (Differential Calculus)	3	0	0	3
8	Professional Core Courses	CSE-304	Computer Organization & Architecture	3	0	0	3
9	Professional Core Courses	CSE-314	Computer Organization & Architecture Laboratory	0	0	4	2
10	Project/seminar/Internship, etc.	CSE - 315	Internship - I	0	0	3	3
11	Mandatory Course	MC 201	Indian Knowledge System	-	-	-	0
Total credits							26

Semester IV (Second year)
Curriculum Branch/Course: Computer Science Engineering

Sl. No	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE-401	Discrete Mathematics	3	1	0	4
2	Professional Core Courses	CSE-402	Operating Systems	3	0	0	3
3	Professional Core Courses	CSE-412	Operating Systems Laboratory	0	0	4	2
4	Professional Core Courses	CSE-403	Object Oriented Programming	2	0	0	2
5	Professional Core Courses	CSE-413	Object Oriented Programming Laboratory	0	0	4	2
6	Professional Core Courses	CSE-404	Database Management Systems	3	0	0	3
7	Professional Core Courses	CSE-414	Database Management Systems Laboratory	0	0	4	2
8	Humanities & Social Sciences including Management courses	HSMC 201	Managerial Economics	3	0	0	3
9	Humanities & Social Sciences including Management courses	HSMC 222	Technical English for Engineers	0	0	4	2
Total credits							23

Semester V (Third year]
Curriculum Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Engineering Science Course	ESC501	Signals & Systems	3	0	0	3
2	Professional Core Courses	CSE-501	Design & Analysis of Algorithms	3	0	0	3
3	Professional Core Courses	CSE-511	Design & Analysis of Algorithms Laboratory	0	0	4	2
4	Professional Core Courses	CSE-502	Computer Network-I	3	0	0	3
5	Professional Core Courses	CSE-512	Computer Network-II Laboratory	0	0	4	2
4	Professional Core Courses	CSE-503	Formal Language & Automata Theory	3	0	0	3
5	Humanities & Social Sciences including Management courses	HSMC-302	Management & Accountancy	3	1	0	4
6	Professional Elective courses	CSE-ELV-501	Elective-I	3	0	0	3
7	Mandatory Courses	MC301	Constitution of India	-	-	-	0

8	Project/seminar/Internship, etc	CSE 513	Internship - II	0	0	4	4
Total credits							27

Semester VI (Third year]
Curriculum Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE-601	Compiler Design	3	0	0	3
2	Professional Core Courses	CSE-611	Compiler Design Laboratory	0	0	4	2
3	Professional Core Courses	CSE-602	Computer Network-II	3	0	0	3
4	Professional Core Courses	CSE-612	Computer Network-II Laboratory	0	0	4	2
5	Professional Elective courses	CSE-ELV-601	Elective-II	3	0	0	3
6	Open Elective courses	CSE-O-ELV-601	Open Elective-I	3	0	0	3
			Total credits				16

Semester VII (Fourth year]
Curriculum Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Elective courses	CSE-ELV-701	Elective-III	3	0	0	3
2	Professional Elective courses	CSE-ELV-702	Elective-IV	3	0	0	3
3	Open Elective courses	CSE-O-ELV-701	Open Elective-II	3	0	0	3
4	Project/seminar/Internship, etc.	CSE-711	Internship-III	0	0	4	4
5	Project	CSE-712	Project-I	0	0	8	4
Total credits							17

Semester VIII (Fourth year]
Curriculum Branch/Course: Computer Science Engineering
[Summer Industry Internship]

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Elective courses	CSE-ELV-801	Elective-V	3	0	0	3
2	Open Elective courses	CSE-ELV-O-802	Open Elective-III	3	0	0	3
3	Open Elective courses	CSE-O-ELV-801	Open Elective-IV	3	0	0	3
4	Project	CSE-811	Project-II	0	0	8	4
5	Project/seminar/Internship, etc.	CSE-812	Grand-VIVA	0	0	2	2
Total credits							15

