UNDERGRADUATE DEGREE
COURSES IN

COMPUTER SCIENCE
&
ENGINEERING

(Engineering &Technology)

[Proposed Syllabus – 2021onwards]

Department of Computer Science & Engineering
Dibrugarh University Institute of Engineering and Technology, Dibrugarh University
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All India Council for Technical Education
Model curriculum for
Undergraduate Degree Courses in Engineering & Technology

COMPUTER SCIENCE AND ENGINEERING

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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	0.5credit
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	56
5	Professional Elective courses relevant to chosen specialization/branch	15
6	Open subjects – Electives from other technical and /or emerging subjects	12
7	Project work, seminar and internship in industry or elsewhere	21
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution]	(non-credit)
	Total	**162**

**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	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	HSMC 101	English	2	0	2	3	1
2	HSMC 201	Managerial Economics	3	0	0	3	4
3	HSMC 302	Management and Accountancy	3	1	0	4	5
4	HSMC 222	Technical English for Engineers	0	0	4	2	4
Total Credits:						**12**	

BASIC SCIENCE COURSE [BSC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	BSC101	Physics (Semi-conductor Physics)	3	1	3	5.5	2
2	BSC 104	Mathematics-II (Probability and Statistics)	3	1	0	4	2
3	BSC 103	Mathematics-I (Calculus and LinearAlgebra)	3	1	0	4	1
4	BSC 102	Chemistry-I	3	1	3	5.5	2
5	BSC 301	Mathematics-III (Differential Calculus)	3	0	0	3	3
Total Credits:						**22**	

ENGINEERING SCIENCE COURSE [ESC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	ESC 101	Basic Electrical Engineering	3	1	2	5	1
2	ESC 102	Engineering Graphics & Design	1	0	4	3	1
3	ESC 201	Programming for Problem Solving	3	0	4	5	2
4	ESC 202	Workshop/Manufacturing Practices	1	0	4	3	2
5	ESC 302	Digital Electronics	3	0	4	5	4
6	ESC 501	Signals and Systems	3	0	0	3	5
Total Credits:						**24**	

PROFESSIONAL CORE COURSES [PCC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-301	Principles of Programming Language	3	0	0	3	3
2	CSE-302	Data Structure & Algorithms	3	0	4	5	3
3	CSE-313	Software tools	0	0	4	2	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 OrientedProgramming	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, Automats and Compiler	3	0	0	3	5
12	CSE- 601	Compiler Design	3	0	4	5	6
13	CSE – 602	Computer Networks-II	3	0	4	5	6
Total Credits:						**56**	

PROFESSIONAL ELECTIVE [PEC]

Sl. No	Code No.	Course Title	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	7
4	CSE-ELV-701	Elective - IV	3	0	0	3	7
5	CSE-ELV-702	Elective - V	3	0	0	3	8
Total Credits						**15**	

OPEN ELECTIVE COURSES [OEC]

Sl. No	Code No.	Course Title	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.	• 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	BSC 103	Mathematics-I	3	1	0	4
2	Engineering Science Course	ESC 102	Engg. Graphics & Design	0	0	4	2
3	Engineering Science Course	ESC 101	Basic Electrical Engineering	3	1	0	4
4	Engineering Science Course	ESC 111	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	HSMC 101	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	BSC 102	Chemistry-I	3	1	0	4
2	Basic Science course	BSC 112	Chemistry-I Laboratory	0	0	3	1.5
3	Basic Science course	BSC101	Physics-I	3	1	0	4
4	Basic Science course	BSC111	Physics-I Laboratory	0	0	3	1.5
3	Basic Science course	BSC 104	Mathematics-II (Probability and Statistics)	3	1	0	4
4	Engineering Science Course	ESC 103	Programming for Problem Solving	3	0	0	3
4	Engineering Science Course	ESC 113	Programming for Problem Solving Laboratory	0	0	4	2
5	Engineering Science Course	ESC 112	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	CSE 301	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	ESC 301	Digital Electronics	3	0	0	3
5	Engg. Science Course	ESC 311	Digital Electronics Laboratory	0	0	4	2

6	Professional Core Courses	CSE-313	Software tools	0	0	4	2
7	Basic Science course	BSC 301	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-I Laboratory	0	0	4	2
4	Professional Core Courses	CSE-503	Formal Language & AutomataTheory	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**

List of Electives:

5th Semester:

CSE-ELV-501	**Elective-I**	**3L:0T:0P**	**3 Credits**

- Computer Graphics.
- Machine learning
- Cloud Computing

6th Semester:

CSE-ELV-601	**Elective-II**	**3L:0T: 0P**	**3 Credits**

- Image Processing
- Embedded System
- Natural language Processing.
- Data analytics
- Soft Computing

CSE-O-ELV-601	**Open Elective-I**	**3L:0T: 0P**	**3 Credits**

- Graph Theory
- Information Theory and Coding
- Wireless Network

7th Semester:

CSE-ELV-701& 702	**Elective- III & IV**	**3L:0T: 0P**	**3 Credits**

- Practical Reinforcement learning
- Internet Of Thinks
- Neural Network and deep learning
- Peer to peer network
- Data Mining
- Real time cyber thread detection and mitigation.
- Advanced Computer Architecture
- Ad-Hoc And Sensor Network
- Computational Geometry
- Advanced Design and analysis of Algorithm

CSE-O-ELV-701	**Open Elective-II**	**3L:0T: 0P**	**3 Credits**

- Programming in JAVA
- Biology for Engineers

8th Semester:

CSE-ELV-801	**Elective-V**	**3L:0T: 0P**	**3 Credits**

- Artificial Intelligence
- Parallel and Distributed Algorithm
- Computational Complexity
- Real Time system.
- Web Technology
- Theory of Computation
- Distributed System

CSE-O-ELV-801	**Open Elective-III**	**3L:0T: 0P**	**3 Credits**

- Cryptography and Network Security
- Mobile computing
- Application of Fuzzy logic

CSE-O-ELV-802	**Open Elective-IV**	**3L:0T: 0P**	**3 Credits**

- Software Engineering
- Cyber law and Ethics