

CURRICULUM
B.TECH. COMPUTER SCIENCE & ENGINEERING (CLOUD & MOBILE COMPUTING)
(IN ASSOCIATION WITH IBM)
CHOICE BASED CREDIT SYSTEM

STUDENTS LEARNING OUTCOMES

The curriculum and syllabi of B.Tech Computer Science & Engineering (Cloud & Mobile Computing) program (2017-18) conforms to Outcome Based Education (OBE) for a flexible and structured Choice Based Credit System (CBCS). In general, **ELEVEN STUDENT OUTCOMES** (a-k) have been identified and the curriculum and syllabi have been chosen in such a way that each of the modules meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further, each module in the program spells out clear instructional objectives which are mapped to the student outcomes.

The Student Outcomes are:

- (a) Ability to apply knowledge of Mathematics and science in software engineering solutions.
- (b) Ability to understand the engineering concepts and their applications using the acquired broad based knowledge.
- (c) Ability to practice and develop software for interpretation and analysis of data.
- (d) Ability to use the techniques, skills, and modern engineering tools necessary for software and hardware practices.
- (e) Ability to identify and analyze Computer Science and Engineering problems in related multiple disciplines including software development, middleware, software testing, computer networks, cloud and mobile computing.
- (f) Ability to design, develop and verify a software system to meet desired needs ensuring its reliability and security in addition to satisfying economic, social and ethical constraints.
- (g) Ability to apply Enterprise level application software for design of engineering product/process.
- (h) Ability to function as consultant for the development of sustainable software solutions.
- (i) An understanding of professional and ethical values.
- (j) Ability to communicate effectively in diverse groups and exhibit leadership skills.
- (k) To develop an understanding of global environment and its protection.

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Category		Sub-Category	Total Number of Credits (B.Tech)	Total Number of Credits (B.Tech-LEET)	Min Required Credits (B.Tech)	Min Required Credits (B.Tech-LEET)	Percentage of Total credits
G	General		52	0	48	0	26%
E	Engineering	Program Core (PC)	78	78	78	78	
		Program Elective (PE)	23	23	19	19	
		Generic Elective (GE)	8	8	4	4	
		Project (PD)	20	20	20	20	
Total : Engineering			129	129	121	121	65%
M	Management		7	7	7	7	4%
P	Professional Enrichment	Ability enhancement (AE)	8	8	7	7	
		Skill enhancement (SE)	4	4	4	4	
		Creativity & Innovation (CI)	1	1	0	0	
		Co-Curricular Activity (CA)	1	1	0	0	
Total : Professional Enrichment			14	14	11	11	6%
Overall Total			202	150*	187	139*	100%

Note:

Students are to earn at least 187/139*credits out of 202/150* credits to become eligible for the award of B.Tech degree.

* FOR LATERAL ENTRY

PROGRAM SCHEME

SEMESTER - I

MODULE CODE	CATEGORY	SUB CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
ENG0101	G		ENGLISH	3	0	0	3	25	75	100
MATH0101	G		APPLIED MATHEMATICS - I	3	1	0	3.5	50	100	150
CHEM0101	G		INDUSTRIAL CHEMISTRY	3	0	0	3	25	75	100
CHEM0102	G		CHEMISTRY LAB	0	0	2	1	25	25	50
PHYS0101	G		APPLIED PHYSICS – I	3	1	0	3.5	50	100	150
PHYS0102	G		PHYSICS LAB – I	0	0	2	1	25	25	50
CSEI1103	G		SOFTWARE FOUNDATION AND PROGRAMMING 1 (WITH C)	3	0	0	3	25	75	100
CSEI1104	G		SOFTWARE FOUNDATION AND PROGRAMMING 1 (WITH C) LAB	0	0	2	1	25	25	50
ECEN0101	G		BASICS OF ELECTRONIC AND ELECTRICAL SCIENCE	4	0	0	4	50	100	150
ECEN0103	G		BASICS OF ELECTRONIC & ELECTRICAL SCIENCE LAB	0	0	2	1	25	25	50
MECH0101	G		ENGINEERING GRAPHICS	1	0	4	3	75	50	125
TOTAL				20	2	12	27	400	675	1075

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

SEMESTER - II

MODULE CODE	CATEGORY	SUB CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
MATH0116	G		APPLIED MATHEMATICS-II	4	1	0	4.5	50	100	150
PHYS0103	G		APPLIED PHYSICS-II	3	1	0	3.5	50	100	150
PHYS0104	G		APPLIED PHYSICS-II LAB	0	0	2	1	25	25	50
ENGC0101	G		ENVIRONMENTAL SCIENCE AND GREEN CHEMISTRY	4	0	0	4	50	100	150
ENGC0102	G		ENVIRONMENTAL SCIENCE AND GREEN CHEMISTRY LAB	0	0	2	1	25	25	50
MECH2104	G		ENGINEERING MECHANICS	4	0	0	4	50	100	150
MECH2105	G		ENGINEERING MECHANICS LAB	0	0	2	1	25	25	50
MATH0117	G		NUMERICAL METHODS	3	0	0	3	25	75	100
CSE11105	E	PC	SOFTWARE FOUNDATION AND PROGRAMMING 1 (WITH C++)	3	0	0	3	25	75	100
CSE11106	E	PC	SOFTWARE FOUNDATION AND PROGRAMMING 1 (WITH C++) LAB	0	0	2	1	25	25	50
CIVL0101	G		BASICS OF CIVIL ENGINEERING	2	0	0	2	25	50	75
CIVL0102	G		BASICS OF CIVIL ENGINEERING LAB	0	0	2	1	25	25	50
TOTAL				23	2	10	29	400	725	1125

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T = Tutorial

P = Practical

C = Credit Point

SEMESTER - III

MODULE CODE	CATEGORY	SUB CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEI2101	E	PC	DATA STRUCTURES AND PROGRAM DESIGN	3	0	0	3	25	75	100
CSEI2102	E	PC	DATA STRUCTURES AND PROGRAM DESIGN LAB	0	0	3	1.5	25	50	75
CSEN2103	E	PC	DISCRETE STRUCTURE	3	1	0	3.5	50	100	150
CSEN2104	E	PC	COMPUTER ARCHITECTURE & ORGANIZATION	3	1	0	3.5	50	100	150
CSEC2101	E	PC	OBJECT ORIENTED PROGRAMMING USING JAVA	3	0	0	3	25	75	100
CSEC2102	E	PC	OBJECT ORIENTED PROGRAMMING USING JAVA LAB	0	0	2	1	25	25	50
	E	PE	ELECTIVE-I	4	0	0	4	50	100	150
MGMT0002	M		PROFESSIONAL ECONOMICS AND FINANCIAL ANALYSIS	3	0	0	3	25	75	100
VALU0119	P	AE	APTITUDE – I	2	0	0	2	25	50	75
VALU0123	P	SE	PROFESSIONAL COMMUNICATION – I	2	0	0	2	25	50	75
ENGL0109	P	AE	ACADEMIC WRITING	0	0	2	1	25	25	50
	P	AE	YOGA/MEDITATION/NSS	0	0	2	1	50	0	50
TOTAL				23	2	9	28.5	400	725	1125

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ELECTIVE I

MODULE CODE	MODULE
CSEN2103	INTERNET & WEB TECHNOLOGY
CSEN2205	E-COMMERCE
CSEN2206	DIGITAL ELECTRONICS

YOGA / MEDITATION / NSS

MODULE CODE	MODULE
VALU0118	YOGA
VALU0121	MEDITATION
VALU0122	NSS

SEMESTER – IV

MODULE CODE	CATEGORY	SUB CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEI2103	E	PC	DATABASE MANAGEMENT SYSTEM	3	0	0	3	25	75	100
CSEI2104	E	PC	DBMS LAB	0	0	2	1	25	25	50
CSEN2115	E	PC	PRINCIPLES OF OPERATING SYSTEM	3	0	0	3	25	75	100
CSEN2116	E	PC	OPERATING SYSTEM LAB	0	0	2	1	25	25	50
CSEN2117	E	PC	DESIGN AND ANALYSIS OF ALGORITHMS	3	1	0	3.5	50	100	150
CSEN2118	E	PC	ALGORITHM DESIGN LAB	0	0	2	1	25	25	50
CSEN3101	E	PC	COMPUTER NETWORKS	3	1	0	3.5	50	100	150
CSEN3102	E	PC	COMPUTER NETWORKS LAB	0	0	2	1	25	25	50
CSEC2103	E	PC	INDUSTRY SESSION ON EMERGING TECHNOLOGIES- CLOUD COMPUTING	4	0	0	4	50	100	150
	E	PE	ELECTIVE-II	4	0	0	4	50	100	150
TOTAL				20	2	8	25	350	650	1000

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

ELECTIVE II

MODULE CODE	MODULE
CSEN2220	NATURAL LANGUAGE PROCESSING
CSEN2222	SOFT COMPUTING
CSEN2223	FUZZY LOGIC

Note: Each student has to undergo practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the V semester.

SEMESTER – V

MODULE CODE	CATEGORY	SUB CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEI3101	E	PC	ESSENTIALS OF SOFTWARE ENGINEERING (OOAD & SW LIFECYCLE)	3	0	0	3	25	75	100
CSEI3102	E	PC	SOFTWARE ENGINEERING (OOAD & SW LIFECYCLE) LAB	0	0	3	1.5	25	50	75
CSEC3101	E	PC	FOUNDATION COURSE IN ENTERPRISE APPLICATION DEVELOPMENT	3	0	0	3	25	75	100
CSEC3102	E	PC	IBM RATIONAL TOOLS LAB	0	0	2	1	25	25	50
CSEN3105	E	PC	THEORY OF AUTOMATA & COMPUTATION	3	1	0	3.5	50	100	150
CSEN3106	E	PD	INDUSTRIAL TRAINING I (TRAINING TO BE UNDERGONE AFTER IV SEMESTER)	0	0	2	1	50	0	50
CSEN3107	E	PD	SPECIALIZED MINOR PROJECT (GROUP)	0	0	4	2	50	50	100
	E	PE	ELECTIVE-III	4	0	0	4	50	100	150
	E	PE	ELECTIVE-IV	4	0	0	4	50	100	150
VALU0136	P	AE	APTITUDE-II	2	0	0	2	25	50	75
VALU0140	P	SE	PROFESSIONAL COMMUNICATION-II	2	0	0	2	25	50	75
TOTAL				21	1	11	27	400	675	1075

ELECTIVE – III

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

MODULE CODE	MODULE
CSEN2210	SYSTEM PROGRAMMING & SYSTEM ADMINISTRATION
CSEN3208	MOBILE APPLICATION DEVELOPMENT
CSEN3209	BIG DATA ANALYSIS

ELECTIVE – IV

MODULE CODE	MODULE
CSEN3210	COGNITIVE NETWORKS
CSEN3211	CRYPTOGRAPHY
CSEN3213	IMAGE PROCESSING

SEMESTER – VI

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN3114	E	PC	ARTIFICIAL INTELLIGENCE	3	1	0	3.5	50	100	150
CSEN3115	E	PC	ARTIFICIAL INTELLIGENCE LAB	0	0	2	1	25	25	50
CSEC3103	E	PC	ESSENTIALS OF HYBRID PROGRAMMING (USING HTML 5 AND DOJO)	3	0	0	3	25	75	100
CSEC3104	E	PC	HYBRID PROGRAMMING (USING HTML 5 AND DOJO) LAB	0	0	2	1	25	25	50
CSEC3105	E	PC	APPLICATION DEVELOPMENT FOR CLOUD DEPLOYMENT	3	0	0	3	25	75	100
CSEC3106	E	PC	CLOUD DEPLOYMENT LAB	0	0	3	1.5	25	50	75
	E	PE	ELECTIVE-V	3	1	0	3.5	50	100	150
	E	GE	ELECTIVE-A	4	0	0	4	50	100	150
CSEN3119	E	PD	SPECIALIZED MINOR PROJECT (INDIVIDUAL)	0	0	8	4	100	100	200
CSEN3120	P	CI	CREATIVITY AND INNOVATION	0	0	2	1	0	50	50
TOTAL				16	2	17	25.5	375	700	1075

- L = Lecture**
T = Tutorial
P = Practical
C = Credit Point

ELECTIVE – V

MODULE CODE	MODULE
CSEN3221	WIRELESS SENSOR NETWORKS
CSEN3222	ADVANCED COMPUTER ARCHITECTURE
CSEN4208	NEURAL NETWORKS

GENERIC ELECTIVE - A^ψ

SAPA0320 SAP-ABAP / SAPM0321 SAP-MM / SAPS0322 SAP-SD
ONE/TWO MOOCS MODULES (Consisting 4 credits in total)

^ψAdditional fee, if any, shall be borne by the student.

Note: Each student has to undergo practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the VII semester.

SEMESTER – VII

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN4101	E	PC	COMPILER DESIGN	3	0	0	3	25	75	100
CSEN4102	E	PC	COMPILER DESIGN LAB	0	0	2	1	25	25	50
CSEN4103	E	PC	DATA WAREHOUSING & DATA MINING	4	0	0	4	50	100	150
CSEC4101	E	PC	ENTERPRISE MOBILE APPLICATION DEVELOPMENT	3	0	0	3	25	75	100
CSEC4102	E	PC	ENTERPRISE MOBILE APPLICATION DEVELOPMENT LAB	0	0	3	1.5	25	50	75
	E	PE	ELECTIVE-VI	3	1	0	3.5	50	100	150
	E	GE	ELECTIVE-B**	4	0	0	4	50	100	150
CSEN4106	E	PD	SPECIALIZED MAJOR PROJECT (GROUP)##	0	0	8	4	100	100	200
CSEN4107			INDUSTRIAL TRAINING II Training to be undergone after VI semester)	0	0	2	1	50	0	50
CLUB0101	P	CA	<i>Co-Curricular Activity</i>	0	0	0	1	25	25	50
TOTAL				17	1	15	26	425	650	1075

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

ELECTIVE VI

MODULE CODE	MODULE
CSEI4201	ADVANCED RDBMS
CSEN4209	ETHICAL HACKING
CSEI4202	MACHINE LEARNING

** To be chosen from Generic Electives offered by departments other than the parent Department.

Only advisory support shall be provided by the faculty.

SEMESTER – VIII

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN4111	E	PD	SPECIALIZED MAJOR PROJECT (INDIVIDUAL)##	0	0	16	8	200	200	400
ENVS0101	P	AE	ENVIRONMENTAL SCIENCES	2	0	0	2	25	50	75
MGMT0103	M		ENTREPRENEURSHIP	4	0	0	4	50	100	150
TOTAL				6	0	16	14	275	350	625

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

Only advisory support shall be provided by the faculty.