

# CURRICULUM

## B.TECH. COMPUTER SCIENCE & INFORMATION TECHNOLOGY

### CHOICE BASED CREDIT SYSTEM

### STUDENTS LEARNING OUTCOMES

The curriculum and syllabi of B.Tech Computer Science and Information Technology program (2017-18) conform 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 problems in related multiple disciplines including software development, middleware, software testing and computer networks.
- (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.

## B. TECH COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

### SUMMARY OF PROGRAM CURRICULUM

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
<b>G</b>	General		<b>52</b>	<b>0</b>	<b>48</b>	<b>0</b>	26%
<b>E</b>	Engineering	Program Core (PC)	70	70	70	70	
		Program Elective (PE)	31	31	27	27	
		Generic Elective (GE)	8	8	4	4	
		Project (PD)	20	20	20	20	
<b>Total : Engineering</b>			<b>129</b>	<b>129</b>	<b>121</b>	<b>121</b>	64%
<b>M</b>	Management		<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	4%
<b>P</b>	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	
<b>Total : Professional Enrichment</b>			<b>14</b>	<b>14</b>	<b>11</b>	<b>11</b>	6%
<b>Overall Total</b>			<b>202</b>	<b>150*</b>	<b>187</b>	<b>139*</b>	<b>100%</b>

**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
ENGL0101	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
ECEN1101	G		ELECTRICAL TECHNOLOGY	2	0	0	2	25	50	75
ECEN1102	G		ELECTRICAL TECHNOLOGY LAB	0	0	2	1	25	25	50
CSEN1101	G		FUNDAMENTALS OF COMPUTERS AND PROGRAMMING (WITH C)	4	0	0	4	50	100	150
CSEN1102	G		FCPC LAB	0	0	2	1	25	25	50
	G		FOREIGN LANGUAGE PART-I #	2	0	0	2	25	50	75
<b>TOTAL</b>				<b>20</b>	<b>2</b>	<b>8</b>	<b>25</b>	<b>350</b>	<b>650</b>	<b>1000</b>

L = Lecture

T = Tutorial

P = Practical

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### # FOREIGN LANGUAGE

One foreign language out of the following

French	LANF0101
German	LANG0102
Spanish	LANS0103

## SEMESTER - II

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
PHYS0103	G		APPLIED PHYSICS-II	3	1	0	3.5	50	100	150
PHYS0104	G		APPLIED PHYSICS LAB – II	0	0	2	1	25	25	50
ECEN0104	G		BASICS OF ELECTRONICS	2	0	0	2	25	50	75
ECEN0105	G		BASICS OF ELECTRONICS LAB	0	0	2	1	25	25	50
MECH0102	G		BASICS OF MECHANICAL ENGINEERING	2	0	0	2	25	50	75
MECH0103	G		BASICS OF MECHANICAL ENGINEERING LAB	0	0	2	1	25	25	50
MECH1102	G		WORKSHOP TECHNOLOGY 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
MATH0116	G		APPLIED MATHEMATICS-II	4	1	0	4.5	50	100	150
MATH0117	G		NUMERICAL METHODS	3	0	0	3	25	75	100
VALU1019	G		VALUE EDUCATION	2	0	0	2	25	50	75
CSEN1107	G		PC LAB	0	0	2	1	25	25	50
	G		FOREIGN LANGUAGE PART- II #	2	0	0	2	25	50	75
<b>TOTAL</b>				<b>20</b>	<b>2</b>	<b>12</b>	<b>27</b>	<b>400</b>	<b>675</b>	<b>1075</b>

### # FOREIGN LANGUAGE

MODULE CODE	MODULE NAME
LANF0104	FRENCH
LANG0105	GERMAN
LANS0106	SPANISH

**L = Lecture**

**T = Tutorial**

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## SEMESTER – III

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN2101	E	PC	DATA STRUCTURE USING 'C'	3	0	0	3	25	75	100
CSEN2102	E	PC	DATA STRUCTURE USING 'C' LAB	0	0	3	1.5	25	50	75
CSEN2103	E	PC	DISCRETE STRUCTURE	3	1	0	3.5	50	100	150
CSIT2101	E	PC	MULTIMEDIA TECHNOLOGIES	4	0	0	4	50	100	150
	E	PE	ELECTIVE-I	4	0	0	4	50	100	150
	E	PE	ELECTIVE-II	4	0	0	4	50	100	150
MGMT0101	M		MANAGEMENT & PROFESSIONAL LEADERSHIP	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/ NCC/ NSS	0	0	2	1	50	0	50
<b>TOTAL</b>				<b>25</b>	<b>1</b>	<b>7</b>	<b>29</b>	<b>400</b>	<b>725</b>	<b>1125</b>

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MODULE CODE	MODULE
VALU0118	YOGA
VALU0121	NCC
VALU0122	NSS

### ELECTIVE I

MODULE CODE	MODULE
CSEN2205	E- COMMERCE
CSEN2206	DIGITAL ELECTRONICS
CSEN2207	INTERNET AND WEB TECHNOLOGY

### ELECTIVE II

MODULE CODE	MODULE
CSEN2208	MODELLING AND SIMULATION
CSEN2209	ENGINEERING ANALYSIS AND DESIGN
CSEN2210	SYSTEM PROGRAMMING AND SYSTEM ADMINISTRATION

## SEMESTER - IV

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSEN2111	E	PC	DATABASE MANAGEMENT SYSTEMS	3	0	0	3	25	75	100
CSEN2112	E	PC	DBMS LAB	0	0	2	1	25	25	50
CSEN2113	E	PC	OBJECT ORIENTED PROGRAMMING USING C++	3	1	0	3.5	50	100	150
CSEN2114	E	PC	OOPS using C++ 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
CSIT2102	E	PC	OBJECT ORIENTED ANALYSIS AND DESIGN	3	1	0	3.5	50	100	150
CSIT2103	E	PC	OBJECT ORIENTED ANALYSIS AND DESIGN LAB	0	0	2	1	25	25	50
	E	PE	ELECTIVE- III	4	0	0	4	50	100	150
	E	PE	ELECTIVE-IV	4	0	0	4	50	100	150
<b>TOTAL</b>				<b>23</b>	<b>3</b>	<b>8</b>	<b>28.5</b>	<b>400</b>	<b>750</b>	<b>1150</b>

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### ELECTIVE III

MODULE CODE	MODULE
CSEN2220	NATURAL LANGUAGE PROCESSING
CSEN2221	DIGITAL SIGNAL SPEECH PROCESING
CSEN2222	SOFT COMPUTING

### ELECTIVE IV

MODULE CODE	MODULE
CSEN2223	FUZZY LOGIC
CSIT2204	NETWORK PROGRAMING AND MANAGEMENT
CSEN2225	SYSTEM PROGRAMMING

**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
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
CSEN3103	E	PC	COMPUTER GRAPHICS	3	1	0	3.5	50	100	150
CSEN3104	E	PC	COMPUTER GRAPHICS 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-V	4	0	0	4	50	100	150
	E	PE	ELECTIVE-VI	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
<b>TOTAL</b>				<b>21</b>	<b>3</b>	<b>10</b>	<b>27.5</b>	<b>450</b>	<b>700</b>	<b>1150</b>

**L = Lecture**  
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### ELECTIVE-V

MODULE CODE	MODULE
CSEN3208	MOBILE APPLICATION DEVELOPMENT
CSEN3209	BIG DATA ANALYSIS
CSIT3201	DISTRIBUTED COMPUTING

### ELECTIVE-VI

MODULE CODE	MODULE
CSEN3211	CRYPTOGRAPHY
CSEN3212	MOBILE COMPUTING
CSEN3213	IMAGE PROCESSING

## SEMESTER - VI

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	Internal Marks	External Marks	Total Marks
CSIT3102	E	PC	SYSTEM AND NETWORK ADMINISTRATION	3	1	0	3.5	50	100	150
CSIT3103	E	PC	SYSTEM AND NETWORK ADMINISTRATION LAB	0	0	2	1	25	25	50
CSEN3116	E	PC	JAVA PROGRAMMING	3	0	0	3	25	75	100
CSEN3117	E	PC	JAVA PROGRAMMING LAB	0	0	3	1.5	25	50	75
CSEN3118	E	PC	SOFTWARE ENGINEERING & PROJECT MANAGEMENT	3	1	0	3.5	50	100	150
CSEN3119	E	PD	SPECIALIZED MINOR PROJECT (INDIVIDUAL)	0	0	8	4	100	100	200
	E	PE	ELECTIVE-VII	3	1	0	3.5	50	100	150
	E	GE	ELECTIVE-A	0	0	8	4	50	100	150
CSEN3120	P	CI	CREATIVITY AND INNOVATION	0	0	2	1	0	50	50
<b>TOTAL</b>				<b>16</b>	<b>3</b>	<b>15</b>	<b>25</b>	<b>375</b>	<b>700</b>	<b>1075</b>

### PROGRAM ELECTIVES

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

MODULE CODE	MODULE
CSIT3204	STORAGE TECHNOLOGY FOUNDATION
CSEN3222	ADVANCED COMPUTER ARCHITECTURE
CSEN3223	CLOUD COMPUTING

### GENERIC ELECTIVE - A<sup>ψ</sup>

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

<sup>ψ</sup>Additional 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
CSEN4104	E	PC	ADVANCED JAVA	3	0	0	3	25	75	100
CSEN4105	E	PC	ADVANCED JAVA LAB	0	0	3	1.5	25	50	75
CSEN4106	E	PD	SPECIALIZED MAJOR PROJECT (GROUP) ##	0	0	8	4	100	100	200
CSEN4107			INDUSTRIAL TRAINING II (to be undergone after VI semester)	0	0	2	1	50	0	50
	E	PE	ELECTIVE-VIII	3	1	0	3.5	50	100	150
	E	GE	ELECTIVE-B **	4	0	0	4	50	100	150
CLUB0101	P	CA	<i>Co-Curricular Activity</i>	0	0	0	1	25	25	50
<b>TOTAL</b>				<b>17</b>	<b>1</b>	<b>15</b>	<b>26</b>	<b>425</b>	<b>650</b>	<b>1075</b>

### ELECTIVE-VIII

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

MODULE CODE	MODULE
CSEN4208	NEURAL NETWORK
CSIT4201	MACHINE LEARNING
CSIT4202	INFORMATION CODING TECHNIQUES

\*\* 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
<b>TOTAL</b>				<b>6</b>	<b>0</b>	<b>16</b>	<b>14</b>	<b>275</b>	<b>350</b>	<b>625</b>

**L = Lecture**

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**P = Practical**

**C = Credit Point**

**## Only advisory support shall be provided by the faculty.**