

**BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN COMPUTER SCIENCE  
AND ENGINEERING  
B.TECH (COMPUTER SCIENCE AND ENGINEERING)  
Program, 2018-2022**

**3.1 PROGRAM CURRICULUM**

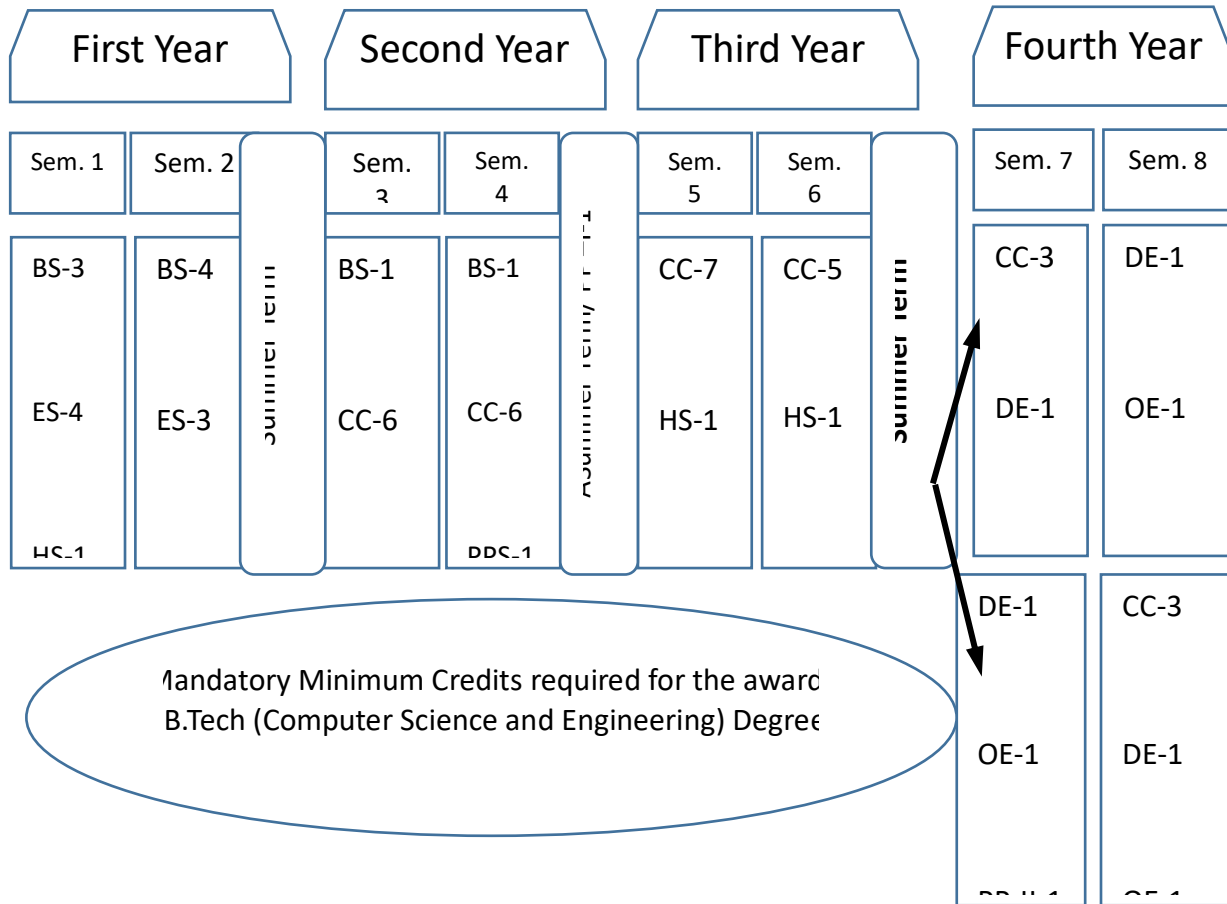
3.1.1 Mandatory Courses and Credits

The B.Tech (Computer Science and Engineering) Program structure (2018 – 2022) consists of 60 Courses totaling 180 credits.

Table 3.1.1 summarizes the type of Courses, number of Courses under each type and the associated credits that are mandatorily required for the completion of the Degree.

<b>TABLE 3.1.1 B.Tech (Computer Science and Engineering) 2018-2022: Mandatory Courses and Credits</b>			
<b>S. No</b>	<b>TYPE OF COURSES</b>	<b>NO. OF COURSES</b>	<b>CREDITS</b>
1	Humanities, Social Sciences and Management Sciences(HS)	4	11
2	Basic Sciences (BS)	9	29
3	Engineering Sciences (ES)	7	21
4	Core (Professional ) Course (CC)	27	76
5	Discipline(Professional) Elective (DE)	4	12
6	Open Elective (OE)	2	6
7	Professional Practice (PP)	2	20
8	Personal and Professional Skills (PPS)	4	4
9	University Learning Courses (ULC)	1	1
<b>TOTAL</b>		<b>60</b>	<b>180</b>
<b>Minimum credit requirement for the award of B.Tech (Computer Science and Engineering) program:180</b>			

### 3.1.2 B.Tech (Computer Science and Engineering) Program Year Wise Structure



**Nomenclature:**

- BS - Basic Sciences
- ES - Engineering Sciences
- HS – Humanities, Social Sciences and Management Sciences
- CC - Core Course
- DE - Discipline/ Professional Electives
- OE - Open Electives
- PP-I/ PP-II - Professional Practice
- PPS-Personal and Professional Skills
- ULC - University Learning Course

In the entire Program, the practical and skill based Course component contribute to an extent of approximately 30% out of the total credits of 180 for B.Tech (Computer Science and Engineering) Program of four years duration.

### 3.2 PROGRAM STRUCTURE

I SEM - PHYSICS CYCLE (Aug-Dec)*							
S. NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	ENG 103	Technical Written Communication	2	1	0	3	3
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	MEC 151	Workshop Practice	0	0	2	1	2
9	PPS 105	Building Self Confidence	0	0	2	1	2
		<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>24</b>	<b>29</b>

I SEM - CHEMISTRY CYCLE (Aug-Dec)#							
S. NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
6	ENG 104	Technical Spoken Communication	1	0	2	3	3
7	CSE 151	Computer Programming	2	0	4	4	6
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
9	PPS 105	Building Self Confidence	0	0	2	1	2
		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>	<b>30</b>

II SEM - CHEMISTRY CYCLE (Jan-May)*							
S. NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 102	Engineering Mathematics – II	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
6	ENG 104	Technical Spoken Communication	1	0	2	2	3
7	CSE 151	Computer Programming	2	0	4	4	6
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
9	PPS 106	Effective Communication	0	0	2	1	2
		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>	<b>30</b>

II SEM - PHYSICS CYCLE (Jan-May)#							
S. NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 102	Engineering Mathematics – II	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	ENG 103	Technical Written Communication	2	1	0	3	3
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	MEC 151	Workshop Practice	0	0	2	1	2
9	PPS 106	Effective Communication	0	0	2	1	2
		<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>24</b>	<b>29</b>

**Note: At the end of the 1<sup>st</sup> year (Common to all B.Tech. Program) the total credits offered is 49.**

The 1<sup>st</sup> year B.Tech. Program structure is executed in two cycles.

\* The students undergoing the "Physics" cycle shall take the courses as indicated.

# The students undergoing the "Chemistry" cycle shall take the courses as indicated.

<b>III SEMESTER</b>							
S.No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 103	Engineering Mathematics – III	3	1	0	4	4
2	CSE 201	Data Structures	3	0	0	3	3
3	CSE 202	Digital Design	3	0	0	3	3
4	CSE 203	Discrete Mathematics	3	1	0	4	4
5	CSE 204	Object Oriented Programming	0	0	6	3	6
6	CSE 251	Data Structures Lab	0	0	2	1	2
7	CSE 252	Digital Design Lab	0	0	2	1	2
8	PPS 107	Design Thinking And Team Building	0	0	2	1	2
9	ULC 101	University Learning Course *				1	
		<b>TOTAL</b>	12	2	12	20/ 21	26

\*Student has to register for University Learning Course in any one semester 3/ 4/ 6 to earn the mandatory credits

<b>IV SEMESTER</b>							
S.No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 105	Probability and statics	3	1	0	4	4
2	CSE 205	Computer Organization and Architecture	3	1	0	4	4
3	CSE 206	Microprocessors and Microcontrollers	3	0	0	3	3
4	CSE 207	Database Management Systems	3	0	0	3	3
5	CSE 208	Theory of Computations	3	1	0	4	4
6	CSE 253	Database Management Systems Lab	0	0	4	2	4
7	CSE 254	Microprocessors and Microcontrollers-Lab	0	0	2	1	2
8	PPS 108	Being Corporate Ready	0	0	2	1	2
9	ULC 101	University learning Course*				1	
		<b>TOTAL</b>	15	3	8	22/ 23	26

\*\* Note Students will undergo professional practice I during the summer break between the fourth and fifth semester and the credits earned will be accounted in the fifth semester.

V SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CSE 209	Graph Theory and Combinatorics	3	1	0	4	4
2	CSE 210	Operating Systems	3	0	0	3	3
3	CSE 211	Computer Networks	3	0	0	3	3
4	CSE 212	Analysis of Algorithms	3	0	0	3	3
5	CSE 214	Principles of Programming Languages ^	3	0	0	3	3
6	CSE 216	Software Engineering	3	0	0	3	3
7	CSE 3XX	Discipline Elective-I	0	0	6	3	6
8	MGT 112/ MGT 113	Engineering Economics/ Digital Entrepreneurship	3	0	0	3	3
9	CSE 255	Analysis of Algorithms Lab	0	0	2	1	2
10	PIP 101	Professional Practice - I **				5	
		<b>TOTAL</b>	21	1	8	31	30

^ Internal Evaluation only

VI SEMESTER							
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CSE 213	Object Oriented Analysis and Design	3	0	0	3	3
2	CSE 215	Cryptography and Network Security	3	0	0	3	3
3	CSE 217	Compiler Design	3	1	0	4	4
4	CSE 256	Internet Technologies	0	0	6	3	6
5	CSE 257	Network Programming Lab	0	0	4	2	4
6	CSE 3XX	Discipline Elective – II	3	0	0	3	3
7	MGT 113/ MGT 112	Digital Entrepreneurship/ Engineering Economics	3	0	0	3	3
8	ULC 101	University Learning Course *				1	
		<b>TOTAL</b>	15	1	10	21/ 22	26

**VII SEMESTER**

S.No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CSE 218	Human Computer Interaction	3	0	0	3	3
2	CSE 219	Big Data Analytics	2	0	2	3	4
3	CSE 220	Internet of Things	2	0	2	3	4
4	CSE 3XX	Discipline Elective – III	3	0	0	3	3
5	OPE 4XX	Open Elective – I	3	0	0	3	3
		<b>TOTAL</b>	<b>13</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>17</b>

**VIII SEMESTER**

S.No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	CSE 3XX	Discipline Elective – IV	3	0	0	3	3
2	OPE 4XX	Open Elective – II	3	0	0	3	3
3	PIP 102	Professional Practice- II				15	
		<b>TOTAL</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>6</b>

**TABLE -2**

**DISCIPLINE ELECTIVES**

S.NO	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
1	CSE 301	Programming in Advanced JAVA	0	0	6	3	6
2	CSE 302	Programming in C# and .NET framework	0	0	6	3	6
3	CSE 303	LAMP	0	0	6	3	6
4	CSE 304	Mobile Communications	3	0	0	3	3
5	CSE 305	Parallel Computing	3	0	0	3	3
6	CSE 306	Cloud Computing	3	0	0	3	3
7	CSE 307	Data Mining and Warehouse	3	0	0	3	3
8	CSE 308	Artificial Intelligence	3	0	0	3	3
9	CSE 309	Virtualization	3	0	0	3	3
10	CSE 310	Mobile Applications Development	0	0	6	3	6
11	CSE 311	Web Services	3	0	0	3	3
12	CSE 312	Game Theory	3	0	0	3	3
13	CSE 313	Storage Area Networks	3	0	0	3	3
14	CSE 314	Embedded Systems	3	0	0	3	3
15	CSE 315	Software Architecture	3	0	0	3	3
16	CSE 316	Advanced Computer Architecture	3	0	0	3	3
17	CSE 317	Programming in Python	0	0	6	3	3
18	CSE318	Information Retrieval	3	0	0	3	3
19	CSE319	Machine Learning	3	0	0	3	3
20	CSE320	Graphics Programming	2	0	2	3	4

**TABLE 3.2.2**

**OPEN ELECTIVE**

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
<b>Open Elective Courses offered by Department of Civil Engineering, SOE</b>							
1	CIV 401	Geographical Information Systems	3	0	0	3	3



2	CIV 402	Environmental Impact Assessment	3	0	0	3	3
3	CIV 403	Sustainable Materials and Green Buildings	3	0	0	3	3
4	CIV 404	Construction Project Management	3	0	0	3	3
<b>Open Elective Courses offered by Department of Computer Science and Engineering, SOE</b>							
1	CSE 401	Image Processing	3	0	0	3	3
2	CSE 402	Data Structures Using C	3	0	0	3	3
3	CSE 403	Software Testing and Quality Assurance	3	0	0	3	3
4	CSE 404	Social Network Analytics	3	0	0	3	3
5	CSE 405	Digital and Mobile Forensics	3	0	0	3	3
6	CSE 406	Database Management Systems	3	0	0	3	3
7	CSE 407	Multimedia and Animation	3	0	3	3	4
<b>Open Elective Courses offered by Department of Electrical and Electronics Engineering, SOE</b>							
1	EEE 401	Artificial Neural Networks	3	0	0	3	3
2	EEE 405	Energy Audit	3	0	0	3	3
3	EEE 406	Research Methodology	3	0	0	3	3
4	EEE 407	Smart Grid Technology	3	0	0	3	3
5	EEE 408	Professional Ethics in Engineering	3	0	0	3	3
<b>Open Elective Courses offered by Department of Electronics and Communication Engineering, SOE</b>							
1	ECE 401	Artificial Neural Networks	3	0	0	3	3
2	ECE 402	Biomedical Instrumentation	3	0	0	3	3
3	ECE 407	Internet of Things	3	0	0	3	3
4	ECE 408	Industrial Automation and Control	3	0	0	3	3
<b>Open Elective Courses offered by Department of Mechanical Engineering, SOE</b>							
1	MEC 401	Automotive Vehicles	3	0	0	3	3
2	MEC 402	Nanotechnology	3	0	0	3	3
3	MEC 405	Engineering Optimisation	3	0	0	3	3
4	MEC 406	Operations Research for Engineers	3	0	0	3	3
5	MEC 407	Operations Management	3	0	0	3	3
6	MEC 408	Work Study	3	0	0	3	3
7	MEC 409	Project Management	3	0	0	3	3
8	MEC 410	Organizational Behaviour	3	0	0	3	3
9	MEC 411	Renewable Energy Systems	3	0	0	3	3

**Open Elective Courses offered by Department of Petroleum Engineering, SOE**

1	PET 402	Computational Methods in Chemical Engineering	3	0	0	3	3
2	PET 403	Computational Fluid Dynamics	3	0	0	3	3
3	PET 405	Petroleum Corrosion Technology	3	0	0	3	3
4	PET 406	Polymer Technology	3	0	0	3	3
5	PET 407	Total Quality Management	3	0	0	3	3
6	PET 408	Oil and Gas Marketing and Resource Management	3	0	0	3	3

**Open Elective Courses offered by Department of Basic Sciences and Humanities, SOE**

1	PSY401	Social Psychology	3	0	0	3	3
2	ENG401	Literature Appreciation	3	0	0	3	3
3	CHE 401	Composite Materials	3	0	0	3	3
4	CHE 402	Catalysis Technology	3	0	0	3	3