Annexure – III

Study Scheme for B.Tech – CSE (Batch 2023)

NEP 2020 Implementation in B.Tech - CSE

S. No.	Certification Type	Stage of Exit	Programme duration	Mandatory credits to be secured for the certification
1	Undergraduate Certificate in Computer Science & Engineering	For those who exit after the first year (2 semesters) of the undergraduate programme.	First year or 2 semesters of the undergraduate programme	44
2	Undergraduate Diploma in Computer Science & Engineering	For those who exit after two years (4 semesters) of the undergraduate programme	First two years or 4 semesters of the undergraduate programme	84
3	Bachelor of Science in Computer Science & Engineering	For those who exit after three years (6 semesters) of the undergraduate programme	First three years or 6 semesters of the undergraduate programme	124
4	Bachelor of Technology in Computer Science and Engineering	For those who exit after four years (8 semesters) of the undergraduate programme	First four years or 8 semesters of the undergraduate programme	160
Multiple Entry				
	Entry Level	**Eligibility**		
1	Second Year (3rd Semester)	• Subject to availability of seats in respective category and programme. • Student must have earned required number of credits defined in the respective programme. • Subject to the equivalence verification of credits from the department admission committee. • Admission will be on the basis of merit in the last qualified exam. • Any other criteria decided by the department fronm time to time.		
2	Third Year (5th Semester)	• Subject to availability of seats in respective category and programme. • Student must have earned required number of credits defined in the respective programme. • Subject to the equivalence verification of credits from the department admission committee.		

		• Admission will be on the basis of merit in the last qualified exam. • Any other criteria decided by the department fronm time to time.
3	Fourth Year (7^{th} Semester)	• Subject to availability of seats in respective category and programme. • Student must have earned required number of credits defined in the respective programme. • Subject to the equivalence verification of credits from the department admission committee. • Admission will be on the basis of merit in the last qualified exam. • Any other criteria decided by the department fronm time to time.

Semester –I

Course Code	Course Title	Credits	L	T	P	M1	M2	MJ	CIA	Total
	Induction Program	0	0	0	0	0	0	0	0	0
BECSE1C001	Engineering Mathematics - I	4	3	1	0	20	20	50	10	100
BECSE1C002	Engineering Physics - I	5	3	1	-	20	20	50	10	100
	Engineering Physics – I Lab	0	0	0	2	5	5	10	5	25
BECSE1C003	English for Technical Communication	4	3	1	0	20	20	50	10	100
BECSE1C004	Data Structure using C Programming	6	3	1	-	20	20	50	10	100
	Data Structure using C Programming Lab	0	0	0	4	10	10	20	10	50
BECSE1C005	Problem Solving and Computer Programming in C	5	3	1	-	20	20	50	10	100
	Problem Solving and Computer Programming in C Lab	0	0	0	2	5	5	10	5	25
BECSE1C006	Environment Studies (Audit Course)*	0	2	0	0	0	0	50	0	50
Total		**24**	**17**	**5**	**8**	**-**	**-**	**-**	**-**	**600**

*** Audit Course: Course without credit and qualifying in nature**

Semester –II

Course Code	Course Title	Credits	L	T	P	M1D	END	CIA	Total
BECSE1C007	Engineering Mathematics - II	3	3	0	0	22.5	37.5	15	75
BECSE1C008	Data Science	4	3	0	-	22.5	37.5	15	75
	Data Science Lab	0	0	0	1	7.5	12.5	5	25
BEECE1C009	Basic Electronics	4	3	0	-	22.5	37.5	15	75
	Basic Electronics Lab.	0	0	0	1	7.5	12.5	5	25
BECSE1C010	Computer Architecture	3	0	0	0	22.5	37.5	15	75
BECSE1C011	Professional Communication	4	3	0	0	22.5	37.5	15	75
	Language Lab	0	0	0	1	7.5	12.5	5	25
BECSE1C012	Introduction to Biology (In-house/MOOC course from Swayam/NPTEL)	2	2	0	0	15	25	10	50
BECSE1C013	Rights, Responsibilities, Law and Constitution (Audit Course)* In-house/MOOC course from Swayam/NPTEL	0	2	0	0	0	50	0	50*
Total		**20**	**16**	0	3	**-**	**-**	**-**	**500**

*** Audit Course: Course without credit and qualifying in nature**

Mandatory Internship/Training

Students will have to take up summer internship/training/MOOC Course of 4 - 6 weeks (40/60 Hrs.) at industry/organizations of repute/online platforms after 2th semester, that will be accredited in 3th semester.

Semester –III

Course Code	Course Title	Credits	L	T	P	MID	END	CIA	Total
BECSE2C001	Discrete Mathematics	3	3	0	0	22.5	37.5	15	75
BECSE2C002	Artificial Intelligence	3	3	0	0	22.5	37.5	15	75
BECSE2C003	Design and Analysis of Algorithms	4	3	0	0	22.5	37.5	15	75
	Design and Analysis of Algorithms Lab.	0	0	0	1	7.5	12.5	5	25
BECSE2C004	Data Communication & Computer Networks	4	3	0	0	22.5	37.5	15	75
	Data Communication & Computer Networks Lab	0	0	0	1	7.5	12.5	5	25
BECSE2C005	Object Oriented Programming using C++	4	3	0	0	22.5	37.5	15	75
	Object Oriented Programming using C++ Lab	0	0	0	1	7.5	12.5	5	25
BECSE2C006	Professional Ethics (Audit Course)* In-house/MOOC course from Swayam/NPTEL	-	-	-	-	-	50	-	50*
BECSE2C007	Indian Knowledge Systems (Audit Course)* In-house/MOOC course from Swayam/NPTEL	-	-	-	-	-	50	-	50*
BECSE2C008	Mandatory Internship /Training**	2	-	-	-	-	50	-	50
Total		**20**	**15**	**0**	**3**	**-**	**-**	**-**	**500**

*** Audit Course: Course without credit and qualifying in nature**

****4 - 6 weeks Mandatory Internship/Training undertaken after 2nd semester during summer vacations.**

SEMESTER IV

Course Code	Course Title	Credits	L	T	P	MID	END	CIA	Total
BECSE2C009	DBMS	4	3	0	-	22.5	37.5	15	75
	DBMS Lab	0	0	0	1	7.5	12.5	5	25
BECSE2C010	Machine Learning	4	3	0	-	22.5	37.5	15	75
	Machine Learning Lab	0	0	0	1	7.5	12.5	5	25
BECSE2C011	Operating Systems	4	3	0	-	22.5	37.5	15	75
	Operating Systems Lab	0	0	0	1	7.5	12.5	5	25
BECSE2C012	Software Engineering	4	3	0	-	22.5	37.5	15	75
	Software Engineering lab	0	0	0	1	7.5	12.5	5	25
BEECE2C013	Digital Electronics	4	3	0	-	22.5	37.5	15	75
	Digital Electronics Lab	0	0	0	1	7.5	12.5	5	25
BECSE2C014	Universal Human Value In-house/MOOC course from Swayam/NPTEL	0	0	0	0	0	50	0	50*
Total		20	15	0	5	-	-	-	500

***Audit Course: Course without credit and qualifying in nature**

Mandatory Internship/Training

Students will have to take up summer internship/training/MOOC Course of 4 - 6 weeks (40/60 Hrs.) at industry/organizations of repute/online platforms after 4th semester, that will be accredited in 5th semester.

SEMESTER V

Course Code	Course Title	Credits	L	T	P	MID	END	CIA	Total
BECSE3C001	Introduction to Information & Network Security	4	3	0	-	22.5	37.5	15	75
	Introduction to Information & Network Security Lab	0	0	0	1	7.5	12.5	5	25
BECSE3C002	Theory of Computation	3	3	0	0	22.5	37.5	15	75
BECSE3C003	Internet of Things (IoT)	4	3	0	-	22.5	37.5	15	75
	Internet of Things (IoT) Lab	0	0	0	1	7.5	12.5	5	25
BECSE3C004	Cloud Computing	3	3	0	0	22.5	37.5	15	75
BECSE3C005	Elective – I	4	4	0	0	30	50	20	100
BECSE3C006	Industrial Economics In-house/MOOC course from Swayam/NPTEL (Open Elective)	0	0	0	0	0	50	0	50*
BECSE3C007	Mandatory Internship/ Training**	2	0	0	0	0	50	0	50
Total		**20**	**16**	**0**	**2**	**-**	**-**	**-**	**500**

*** Audit Course: Course without credit and qualifying in nature**

**** 4 - 6 weeks Mandatory Internship/Training undertaken after 4th semester during summer vacations.**

SEMESTER VI

Course Code	Course Title	Credits	L	T	P	MID	END	CIA	Total
BECSE3C008	Big Data Analytics	4	3	0	-	22.5	37.5	15	75
	Big Data Analytics Lab	0	0	0	1	7.5	12.5	5	25
BECSE3C009	Deep Learning	4	3	0	-	22.5	37.5	15	75
	Deep Learning Lab	0	0	0	1	7.5	12.5	5	25
BECSE3C010	Block Chain	3	3	0	0	22.5	37.5	15	75
BECSE3C011	Cyber Physical Systems	3	3	0	0	22.5	37.5	15	75
BECSE3C012	Elective – II	4	4	0	0	30	50	20	100
BECSE3C013	Human Resource Management In-House/MOOC course from Swayam/NPTEL (Audit Course)*	0	0	0	0	0	50	0	50*
BECSE3C014	Project – I	2	0	0	4	10	25	5	50
Total		**20**	**16**	**0**	**6**	-	-	-	**500**

*** Audit Course: Course without credit and qualifying in nature**

Mandatory Internship/Training

Students will have to take up summer internship/training/MOOC Course of 4 - 6 weeks (40/60 Hrs.) at industry/organizations of repute/online platforms after 6th semester, that will be accredited in 7th semester.

SEMESTER VII

Course Code	Course Title	Credits	L	T	P	MID	END	CIA	Total
BECSE4C001	Digital Forensics & Cyber Security	3	3	0	0	22.5	37.5	15	75
BECSE4C002	Elective – III	4	4	0	0	30	50	20	100
BECSE4C003	Elective - IV	4	4	0	0	30	50	20	100
BECSE4C004	Project – II	5	0	0	6	25	62.5	12.5	125
BECSE4C005	Mandatory Internship/ Training**	4	0	0	0	0	100	0	100
BECSE4C006	MOOC course from Swayam/NPTEL (Audit Course)*	0	0	0	0	0	50	0	50*
Total		**20**	**11**	**0**	**6**	-	-	-	**500**

***Audit Course: Course without credit and qualifying in nature**

****4-6 weeks Mandatory Internship/Training undertaken after 6th semester during summer vacations.**

SEMESTER VIII

Course Code	Course Title	Credits	L	T	P	MID	END	CIA	Total
BECSE4C007	Industrial Training/Major Project	16	0	0	0	120	280	0	400
Total		**16**	**-**	**-**	**-**	**-**	**-**	**-**	**400**

Elective Bucket

B.Tech. Computer Science and Engineering Program is designed to offer elective bucket as soon as student clears semester IV of the program. Student has to choose EB (Elective Bucket) out of the following six choices and shall continue with this group till his/her study at Central University of Jammu. The various elective bucket choices are:

EB 1. Information and Cyber Security

2.1. Computer & Network Security
2.2. Secure Coding
2.3. Cyber Forensics
2.4. Blockchain Technology and Applications

EB 2. Computer Animation and Gaming

1.1. Computer Vision
1.2. 3D Modelling and Animation
1.3. Game Design & Development
1.4. Augmented and Virtual Reality

EB 3. Data Science

3.1. Foundations of Data Science
3.2. Predictive Analytics Using Statistics
3.3. Data Science Applications: NLP, Computer Vision and IOT
3.4. Building Innovative Systems

EB 4. Full Stack

4.1. UI & UX Design
4.2. NoSQL Databases
4.3. Software Testing & Automation
4.4. Cloud & DevOps

EB 5. Conversational AI

5.1. Accelerated Data Science
5.2. Data Mining and Warehousing
5.3. Natural Language Processing

5.4. Speech Processing & Synthesis

EB 6. Robotics and Edge AI

6.1. Basics of Robotics and AI
6.2. Edge Computing Fundamentals
6.3. Embedded Vision
6.4. Reinforcement Learning

Elective – I	**Elective – II**	**Elective – III**	**Elective - IV**
1.1 Computer Vision **2.1** Computer & Network Security **3.1** Foundations of Data Science **4.1** UI & UX Design **5.1** Accelerated Data Science **6.1** Basics of Robotics and AI	**1.2** 3D Modelling and Animation **2.2** Secure Coding **3.2** Predictive Analytics Using Statistics **4.2** NoSQL Databases **5.2** Data Mining and Warehousing **6.2** Edge Computing Fundamentals	**1.3** Game Design & Development **2.3** Cyber Forensics **3.3** Data Science Applications: NLP, Computer Vision and IOT **4.3** Software Testing & Automation **5.3** Natural Language Processing **6.3** Embedded Vision	**1.4** Augmented and Virtual Reality **2.4** Blockchain Technology and Applications **3.4** Building Innovative Systems **4.4** Cloud & DevOps **5.4** Speech Processing & Synthesis **6.4** Reinforcement Learning

Semester Wise Credits for B.Tech. (Computer Science and Engineering)

Category of Course	**Semesters**								**Credit Breakup**
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	
Basic Sciences Courses	9	6	3						18
Humanities and Social Sciences including Management courses	4	2							6
Engineering Science courses including workshop, drawing, basics of electrical/ mechanical/computer etc.		4		4					8
Professional core courses	11	8	15	16	14	14	3		81
Professional Elective courses					4	4	8		16
Project Work & Internship/Training			2		2	2	9	16	31
Audit Course									

	24	20	20	20	20	20	20	16	160