Annexure – VI

Study Scheme for B.Tech – CSE (Cyber Security) (Batch 2024)

NEP 2020 Implementation in B.Tech – CSE (Cyber Security)

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	40
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	80
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	120
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	156
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	MID	END	CIA	Total
	Induction Program	0	0	0	0	0	0	0	0
BECSC1C01	Engineering Mathematics - I	3	3	0	0	22.5	37.5	15	75
BECSC1C02	Engineering Physics - I	4	3	0	-	22.5	37.5	15	75
	Engineering Physics – I Lab	0	0	0	1	7.5	12.5	5	25
BECSC1C03	English for Technical Communication	4	3	0	-	22.5	37.5	15	75
	Language Lab	0	0	0	1	7.5	12.5	5	25
BECSC1C04	Data Structure using C Programming	5	3	0	-	22.5	37.5	15	75
	Data Structure using C Programming Lab	0	0	0	2	15	25	10	50
BECSC1C05	Problem Solving and Computer Programming in C	4	3	0	-	22.5	37.5	15	75
	Problem Solving and Computer Programming in C Lab	0	0	0	2	7.5	12.5	5	25
BECSC1C06	Environment Studies (Audit Course)*	0	2	0	0	0	50	0	50
Total		**20**	**17**	**0**	**6**	**-**	**-**	**-**	**500**

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

Semester –II

Course Code	Course Title	Credits	L	T	P	M1D	END	CIA	Total
BECSC1C007	Engineering Mathematics – II	3	3	0	0	22.5	37.5	15	75
BECSC1C008	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	1	22.5	37.5	15	75
	Basic Electronics Lab.	0	0	0	0	7.5	12.5	5	25
BECSC1C010	Computer Architecture	3	0	0	0	22.5	37.5	15	75
BECSC1C011	Professional Communication	4	3	0	-	22.5	37.5	15	75
	Language Lab	0	0	0	1	7.5	12.5	5	25
BECSC1C012	Introduction to Biology (In-house/MOOC course from Swayam/NPTEL)	2	2	0	0	15	25	10	50
BECSC1C013	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
BECSC2C001	Discrete Mathematics	3	3	0	0	22.5	37.5	15	75
BECSC2C002	Artificial Intelligence	3	3	0	0	22.5	37.5	15	75
BECSC2C003	Design and Analysis of Algorithms	4	3	0	-	22.5	37.5	15	75
	Design and Analysis of Algorithms Lab.	0	0	0	1	7.5	12.5	5	25
BECSC2C004	Data Communication & Computer Networks	4	3	0	-	22.5	37.5	15	75
	Data Communication & Computer Networks Lab	0	0	0	1	7.5	12.5	5	25
BECSC2C005	Object Oriented Programming using C++	4	3	0	-	22.5	37.5	15	75
	Object Oriented Programming using C++ Lab	0	0	0	1	7.5	12.5	5	25
BECSC2C006	Professional Ethics (Audit Course)* In-house/MOOC course from Swayam/NPTEL	-	-	-	-	-	50	-	50*
BECSC2C007	Indian Knowledge Systems In-house/MOOC course from Swayam/NPTEL	-	-	-	-	-	50	-	50*
BECSC2C008	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
BECSC2C008	DBMS	4	3	0	-	22.5	37.5	15	75
	DBMS Lab	0	0	0	1	7.5	12.5	5	25
BECSC2C009	Cyber Security Risk & Incident Management	4	3	0	-	22.5	37.5	15	75
	Cyber Security Risk & Incident Management Lab	0	0	0	1	7.5	12.5	5	25
BECSC2C010	Data Communication & Computer Networks	4	3	0	-	22.5	37.5	15	75
	Data Communication & Computer Networks Lab	0	0	0	1	7.5	12.5	5	25
BECSC2C011	Operating Systems	4	3	0	-	22.5	37.5	15	75
	Operating Systems 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
BECSC2C014	Universal Human Value In-house/MOOC course from Swayam/NPTEL (Audit Course)*	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
BECSC3C001	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
BECSC3C002	Machine Learning	4	3	0	-	22.5	37.5	15	75
	Machine Learning Lab	0	0	0	1	7.5	12.5	5	25
BECSC3C003	Cyber Security Laws and Ethics	3	3	0	0	15	37.5	7.5	75
BECSC3C004	Cyber Security Project Management	3	3	0	0	15	37.5	7.5	75
BECSC3C005	Elective – I	4	4	0	0	20	50	10	100
BECSC3C006	Industrial Economics In-house/MOOC course from Swayam/NPTEL (Audit Course)*	0	0	0	0	0	50	0	50*
BECSC3C007	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
BECSC3C008	Cyber Policy & Governance	3	3	0	0	22.5	37.5	15	75
BECSC3C009	Deep Learning	4	3	0	0	22.5	37.5	15	75
	Deep Learning Lab	0	0	0	1	7.5	12.5	5	25
BECSC3C010	Cyber Physical Systems	3	3	0	0	15	37.5	7.5	75
BECSC3C011	Internet of Things	4	3	0	0	22.5	37.5	15	75
	Internet of Things Lab	0	0	0	1	7.5	12.5	5	25
BECSC3C012	Elective – II	4	4	0	0	20	50	10	100
BECSC3C013	Human Resource Management In-house/MOOC course from Swayam/NPTEL (Audit Course)*	0	0	0	0	0	50	0	50*
BECSC3C014	Project – I	2	0	0	4	10	25	5	50
Total		**20**	**15**	**1**	**7**	-	-	-	**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
BECSC4C001	Digital Forensics & Cyber Security	3	3	0	0	22.5	37.5	15	75
BECSC4C002	Elective – III	4	4	0	0	20	50	10	100
BECSC4C003	Elective – IV	4	4	0	0	20	50	10	100
BECSC4C004	Project – II	5	0	0	6	37.5	62.5	25	125
BECSC4C005	Mandatory Internship/ Training **	4	0	0	0	0	100	0	100
BECSC4C006	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
BECSC4C007	Industrial Training/Major Project	16	0	0	0	120	280	0	400
Total		**16**	-	-	-	-	-	-	**400**

Elective Bucket

B.Tech. Computer Science and Engineering (Cyber Security) 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. Psychology of Cyber Criminal
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** Psychology of Cyber Criminal **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	7	5	3						15
Humanities and Social Sciences including Management courses	4	4							8
Engineering Science courses including workshop, drawing, basics of electrical/ mechanical/computer etc.		4		4					8
Professional core courses	9	7	15	16	14	14	3		78
Professional Elective courses					4	4	8		16
Project Work & Internship/Training			2		2	2	9	16	31
Audit Course									

	20	20	20	20	20	20	20	16	156