

Guru Nanak Dev Engineering College, Ludhiana
Department of Computer Science and Engineering
B.Tech. CSE (Scheme-2024)

THIRD SEMESTER												
S. No.	Module Name	Course Category	Course Code	Course Title	Theory/ Integrated/ Practical	Contact Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1.	Algorithms and Programming	Professional Core Course	CCS101	Object Oriented Programming	Integrated	2	0	4	90	60	150	4
2.	Algorithms and Programming	Professional Core Course	CCS102	Data Structures	Integrated	3	1	4	90	60	150	6
3.	System Architecture, Design and Administration	Professional Core Course	CCS103	Computer Architecture	Theory	3	1	0	40	60	100	4
4.	Basic Sciences and Engineering	Engineering Sciences Courses	ESCS101	Digital Electronics	Integrated	3	0	2	90	60	150	4
5.	Basic Sciences and Engineering	Basic Sciences Course	BSCS101	Applied Mathematics	Theory	3	1	0	40	60	100	4
6.	Technical Communication	Project Work, Seminar and Internship	SMCS101	Seminar and Technical Report Writing for Engineers	Practical	0	0	2	50	-	50	1
7.	Constitutional Studies	Mandatory Courses (Non-Credit)	MC101	Indian Constitution*	Theory	2	0	0	50	0	50	0
8.	Experiential Learning	Project Work, Seminar and Internship	TRCS101	Training-I**	Practical	0	0	40	60	40	100	1
9.	Life Skills	Mentoring and Professional Development	MPD102	Mentoring and Professional Development [#]	Practical	0	0	1	-	-	-	0
Total						16	3	13+40	510	340	850	24

*For non-credit courses students have obtain at least 40% marks in Continuous Assessment (CA) to qualify

**Student will undergo 04 weeks Institutional/Industrial training after 1st year

There will be one period per week for Mentoring and Professional Development; final evaluation of this course will be done based on the combined assessment of odd and even semester of respective year of study.

FOURTH SEMESTER												
S. No.	Module Name	Course Category	Course Code	Course Title	Theory/ Integrated /Practical	Contact Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1.	Data Science	Professional Core Course	CCS104	Database Management Systems	Integrated	3	0	2	90	60	150	4
2.	System Architecture, Design and Administration	Professional Core Course	CCS105	Operating System	Integrated	3	0	2	90	60	150	4
3.	Networks and Internet of Things (IoT)	Professional Core Course	CCS106	Computer Networks	Integrated	3	1	2	90	60	150	5
4.	Basic Sciences and Engineering	Professional Core Course	CCS107	Discrete Mathematics	Theory	3	1	0	40	60	100	4
5.	Artificial Intelligence	Professional Core Course	CCS108	Artificial Intelligence	Integrated	3	0	2	90	60	150	4
6.	Data Science	Professional Core Course	LCCS109	Data Analytics Tools	Practical	0	0	2	50	0	50	1
7.	Business Management	Humanities, Social Sciences and Management Course	HSMC103	Business Essentials for Engineers	Theory	2	0	0	40	60	100	2
8.	Environmental Studies	Mandatory Courses (Non-Credit)	MCCS101	Environmental Sciences and Sustainability*	Theory	2	0	0	50	0	50	0
9.	Life Skills	Mentoring and Professional Development	MPD102	Mentoring and Professional Development#	Practical	0	0	1	100	-	100	1
Total						19	2	11	640	360	1000	25

*For non-credit courses students have obtain at least 40% marks in Continuous Assessment (CA) to qualify

There will be one period per week for Mentoring and Professional Development; final evaluation of this course will be done based on the combined assessment of odd and even semester of respective year of study.

FIFTH SEMESTER												
S. No.	Module Name	Course Category	Course Code	Course Title	Theory/ Integrated /Practical	Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1	Professional Elective Courses	Professional Elective Courses	ECS1XX	Elective – I	Integrated	3	0	2	90	60	150	4
2	System Architecture, Design and Administration	Professional Core Course	CCS110	Theory of Computation	Theory	4	0	0	40	60	100	4
3	Cyber Security	Professional Core Course	CCS111	Cyber Security	Integrated	3	0	2	90	60	150	4
4	Software Engineering	Professional Core Course	CCS112	Software Engineering	Integrated	3	0	2	90	60	150	4
5	Algorithms and Programming	Professional Core Course	CCS113	Design and Analysis of Algorithms	Integrated	3	0	2	90	60	150	4
6	Ideation and Creativity	Engineering Sciences Courses	ESCS102	Design Thinking	Practical	0	0	2	50	0	50	1
7	Entrepreneurship Fundamentals	Engineering Sciences Courses	ESC106	Entrepreneurship and Startups	Theory	3	0	0	40	60	100	3
8	Emergency Preparedness Essentials	Mandatory Course (Non-Credit)	MOC101/ MC103/...	Organization Behavior /Disaster Management and Preparedness/ Other Courses*	Theory	2	0	0	50	0	50	0
9	Indian Knowledge Foundations	Mandatory Course (Non-Credit)	MC102	Essence of Indian Knowledge Tradition *	Theory	2	0	0	50	0	50	0
10	Experiential Learning	Project Work, Seminar and Internship	TRCS102	Training- II**	Practical	0	0	120	60	40	100	1
11	Life Skills	Mentoring and Professional Development	MPD103	Mentoring and Professional Development#	Practical	0	0	1	-	-	-	0
Total						23	0	131	650	400	1050	25
Contact Hours=34												

*For non-credit courses students have obtain at least 40% marks in Continuous Assessment (CA) to qualify.

**Student will undergo 04 weeks Industrial training after 4th semester (2nd year).

There will be one period per week for Mentoring and Professional Development; final evaluation of this course will be done based on the combined assessment of odd and even semester of respective year of study.

SIXTH SEMESTER												
S. No	Module Name	Course Category	Course Code	Course Title	Theory/ Integrated /Practical	Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1	Professional Elective Courses	Professional Elective Courses	ECS1XX	Elective – II	Integrated	3	0	2	90	60	150	4
2	Professional Elective Courses	Professional Elective Courses	ECS1XX	Elective – III	Integrated	3	0	2	90	60	150	4
3	Data Science	Professional Core Course	CCS114	Cloud Computing	Integrated	3	0	2	90	60	150	4
4	System Architecture, Design and Administration	Professional Core Course	CCS115	Compiler Design	Integrated	3	1	2	90	60	150	5
5	Artificial Intelligence	Professional Core Course	CCS116	Machine Learning	Integrated	3	0	2	90	60	150	4
6	Human Values	Humanities, Social Sciences and Management Course	HSMC104	Universal Human Values: Understanding Harmony	Theory	2	0	0	40	60	100	2
7	Career Preparation Skills	Project Work, Seminar and Internship	FSCS101	Corporate Readiness and Employability Enhancement Program	Theory (Elective)	2	0	0	40	60	100	2
8	Experiential Learning	Project Work, Seminar and Internship	PRCS101	Minor Project	Practical	0	0	2	60	40	100	1
9	Life Skills	Mentoring and Professional Development	MPD103	Mentoring and Professional Development#	Practical	0	0	1	100	-	100	1
Total						19	1	13	690	460	1150	27
Contact Hours=33												

*For non-credit courses students have obtain at least 40% marks in Continuous Assessment (CA) to qualify

There will be one period per week for Mentoring and Professional Development; final evaluation of this course will be done based on the combined assessment of odd and even semester of respective year of study.

In 4th year students will proceed for Internship/ Industrial Training-III either in 7th or 8th semester as notified by the concerned department from time to time.

A) 7th Sem on Training

SEVENTH SEMESTER												
S. No.	Module Name	Course Category	Course Code	Course Title	Theory/ Practical	Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1	Experiential Learning	Project Work, Seminar and Internship	TRCS103	Training-III	Practical	0	0	0	450	150	600	12
Total						0	0	0	450	150	600	12

EIGHTH SEMESTER												
S. No.	Module Name	Course Category	Course Code	Course Title	Theory/ Practical	Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1	Professional Elective Courses	Professional Elective Course	ESCS1XX	Elective- IV	Theory	3	0	0	40	60	100	3
2	Experiential Learning	Project Work, Seminar and Internship	PRCS102	Major Project	Practical	0	0	6	120	80	200	3
3	Open Electives	Open Elective Courses	OCS101	Open Elective-I	Theory	3	0	0	40	60	100	3
4	Open Electives	Open Elective Courses	OCS102	Open Elective-II	Theory	3	0	0	40	60	100	3
5	Open Electives	Open Elective Courses	OCS103	Open Elective-III	Theory	3	0	0	40	60	100	3
6	Life Skills	Mentoring and Professional Development	MPD104	Mentoring and Professional Development#	Practical	0	0	1	100	-	100	1
Total						12	0	7	380	320	700	16
Contact Hours=19												

There will be one period per week for Mentoring and Professional Development; final evaluation of this course will be done based on the combined assessment of odd and even semester of respective year of study.

B) 8th Sem on Training

SEVENTH SEMESTER												
S. No.	Module Name	Course Category	Course Code	Course Title	Theory/ Practical	Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1	Professional Elective Courses	Professional Elective Course	ESCS1XX	Elective- IV	Theory	3	0	0	40	60	100	3
2	Experiential Learning	Project Work, Seminar and Internship	PRCS102	Major Project	Practical	0	0	6	120	80	200	3
3	Open Electives	Open Elective Courses	OCS101	Open Elective-I	Theory	3	0	0	40	60	100	3
4	Open Electives	Open Elective Courses	OCS102	Open Elective-II	Theory	3	0	0	40	60	100	3
5	Open Electives	Open Elective Courses	OCS103	Open Elective-III	Theory	3	0	0	40	60	100	3
Total						12	0	6	280	320	600	15
Contact Hours=18												

EIGHTH SEMESTER												
S. No.		Course Category	Course Code	Course Title	Theory/ Practical	Hours Per Week			Internal Marks	External Marks	Total Marks	Credits
						L	T	P				
1	Experiential Learning	Project Work, Seminar and Internship	TRCS103	Training-III	Practical	0	0	0	450	150	600	12
2	Life Skills	Mentoring and Professional Development)	MPD104	Mentoring and Professional Development#	Practical	0	0	1	100	-	100	1
Total						0	0	1	550	150	700	13

There will be one period per week for Mentoring and Professional Development; final evaluation of this course will be done based on the combined assessment of odd and even semester of respective year of study.

Following are six specialisations offered in B.Tech. CSE (Scheme-2024).

1. Artificial Intelligence
2. Cyber Security
3. Data Science
4. Software Engineering
5. Networks and Internet of Things (IoT)
6. Visualization and Computational Imaging

List of electives under each specialisation in 5th and 6th Semester are:

Sr. No.	Specialization	Subject Code	Subjects to be Offered
1	Artificial Intelligence	ECS101 ECS107 ECS113	E-I: Generative AI E-II: Natural Language Processing E-III: Soft Computing
2	Data Science	ECS102 ECS108 ECS114	E-I: Data Warehousing and Business Intelligence E-II: Big Data E-III: Data Science
3	Cyber Security	ECS103 ECS109 ECS115	E-I: Cryptography and Network Security E-II: Information Security Management E-III Digital Forensics
4	Networks and Internet of Things (IoT)	ECS104 ECS110 ECS116	E-I: Advance Computer Networks E-II: Network Security and Cryptography E-III: IoT Architecture and Protocols
5	Software Engineering	ECS105 ECS111 ECS117	E-I: Object Oriented Analysis and Design using UML E-II: Agile Software Development and DevOps E-III: Software Testing and Quality Assurance
6	Visualization and Computational Imaging	ECS106 ECS112 ECS118	E-I: Computer Graphics E-II: Digital Image Processing E-III: Computer Vision