

Agnel Charities

Fr. C. Rodrigues Institute of Technology

Sector 9A, Vashi, Navi Mumbai, 400703, Maharashtra, India

www.fcrit.ac.in

An Autonomous Institute Affiliated to the University of Mumbai



Department of Computer Science and Engineering

Curriculum Structure FY to B.Tech

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First Year Syllabus

Prepared by : Board of Studies for Department of Computer Science and Engineering

Approved By: Academic Council of Fr.C.Rodrigues Institute of Technology

Effective from :2025-26

PREAMBLE FROM DEAN ACADEMICS

Accelerating Towards Excellence: Unveiling a New Era in Education

Dear Students, Faculty, and Stakeholders,

It is with great pleasure and anticipation that we introduce the newly designed curriculum for autonomy at Agnel Charities' Fr. C. Rodrigues Institute of Technology. This pioneering initiative aims to revolutionize engineering education, ensuring our graduates are equipped with not only technical prowess but also the holistic skills necessary for thriving in today's dynamic professional landscape.

1. **Purpose of Autonomy:** Our commitment to autonomy is rooted in the imperative to bridge the gap between academia and industry. We envision education as a catalyst for individual growth, fostering self-sustainability and enhancing employability. Through our curriculum, we strive to nurture engineers who not only excel in their fields but also contribute meaningfully to society.
2. **Curriculum Design: A Top-to-Down Approach:** Our curriculum is meticulously crafted with a top-to-down approach, encompassing all 12 attributes of Program Outcomes mandated by regulatory bodies. Emphasizing a blend of theoretical knowledge and practical application, it is designed to cultivate well-rounded professionals capable of tackling real-world challenges with confidence and competence.
3. **Alignment with National Education Policy-2020:** In adherence to the guidelines laid out in the National Education Policy-2020, our curriculum embodies a multidisciplinary approach, offering a diverse array of core and elective courses. It integrates hands-on learning experiences such as mini and major projects, skill-based labs, and one-semester internships to nurture innovation and problem-solving skills. Additionally, the inclusion of value-added courses, honours, and minors ensures a comprehensive educational journey tailored to individual interests and aspirations.
4. **Opportunities for Teachers in Innovation:** We recognize the pivotal role of our faculty in shaping the educational experience. Our curriculum provides ample opportunities for teachers to innovate in teaching-learning methodologies and evaluation techniques. Through continuous professional development programs and collaborative platforms, we empower our educators to experiment with innovative pedagogies, leverage technology for enhanced learning outcomes, and implement novel assessment strategies. By fostering a culture of innovation among our faculty, we aim to enrich the learning experience and inspire a passion for lifelong learning among our students.

As we embark on this transformative journey, we invite all stakeholders to join us in shaping the future of engineering education. Together, let us strive towards excellence, innovation, and societal impact.

Sincerely,

Dean of Academics Agnel Charities' Fr. C. Rodrigues Institute of Technology

PREAMBLE FROM BOS CHAIRMAN

Dear Students and Stakeholders,

It is with great pleasure and anticipation that Board of Studies of Computer Science and Engineering introduce the newly designed curriculum at Agnel Charities' Fr. C. Rodrigues Institute of Technology. This pioneering initiative aims to equip students with a robust foundation in theoretical principles, practical skills, and ethical considerations essential for success in the IT industry. Through a multidisciplinary curriculum designed under Autonomy, students are empowered to tackle complex challenges with confidence and creativity in an era defined by technological innovation and rapid advancements. Furthermore, the course is designed to cultivate critical thinking, problem-solving abilities, teamwork, and effective communication skills, fostering well-rounded professionals capable of thriving in dynamic work environments.

Department has taken a lead in incorporating philosophy of outcome based education in the process of curriculum development. Curriculum is aligned with Institute, Department vision and mission and with National Education Policy-2020. Designed curriculum is responsive to the diverse needs of students, the larger society and even the global community. At the core of our educational philosophy lies a commitment to holistic development, recognizing that true excellence encompasses not only technical proficiency but also personal growth, ethical integrity, and social responsibility

While designing the curriculum framework, explicit and clear learning purpose is established through vision, mission and program outcomes. Program outcomes are referred as per the guidelines mentioned in NBA SAR-January 2016. Positioning of learning in real world is ensured to keep abreast of latest trends and technologies as per industry requirement. Well thought has been given to selection of courses while structuring the curriculum. Core courses, elective courses, Lab courses, skill based lab courses and Honours/Minor verticals such as Security, Artificial Intelligence & Machine Learning, Internet of Things, Data science are identified. Computer Science and Engineering course integrates a range of experiential learning opportunities, including internships, mini and major projects, industry projects and collaborative research initiatives. Additionally, emphasis is placed on promoting a culture of lifelong learning, encouraging students to stay abreast of emerging trends, engage in continuous professional development, and contribute meaningfully to the advancement of the field.

Department has taken an initiative to design course syllabus by adapting learner centered approach through backward design method facilitating the creation of more cohesive, clear and intentional learning experiences for learners. While designing the syllabus teacher has identified the desired results through setting the course and learning objectives aligned with Bloom taxonomy and Performance Indicators. Teacher has identified the assessments that students will complete in order to demonstrate evidence of learning and even progress towards achievement of learning objectives. Based on this teacher has planned the contents. While planning the content points are considered as what enabling knowledge & skills will learner need in order to achieve desired results, what ways they will be evaluated along the way, what activities will equip learner with needed knowledge and skills, what will need to be taught and how should it best be done using pedagogical and innovative methods. The draft scheme and syllabus were presented to all stakeholders for receiving critical feedback and suggestions. Important and relevant suggestions were incorporated.

We invite all stakeholders to join us on this transformative educational journey, where students are empowered to become catalysts of innovation, drivers of change, and leaders of tomorrow's digital landscape. By embracing a holistic approach to learning, grounded in academic rigor, practical relevance, and ethical values, we strive to nurture a new generation of software professionals poised to make a positive impact on society and shape a brighter future for generations to come.

Sincerely,

Chairman, Board of Studies- Computer Science and Engineering , Agnel Charities' Fr. C. Rodrigues Institute of Technology

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A. Abbreviations

AEC	Ability Enhancement Course
AU	Audit Course
BSC	Basic Science Course including Mathematics
BSL	Basic Science Laboratory Course
ELC	Experiential Learning Course
ESC	Engineering Sciences Course
ESL	Engineering Sciences Laboratory Course
HMC	Honours or Minor Core Course
HML	Honours or Minor Laboratory
HMP	Honours or Minor Mini Project
HSS	Humanities Social Sciences and Management Course
IKS	Indian Knowledge System Course
INT	Internship
L	Lecture
LBC	Laboratory Course
LLC	Liberal Learning Course
MDM	Multidisciplinary Minor Course
MDL	Multidisciplinary Laboratory Course
MJP	Major Project
MNP	Mini Project
OEC	Open Elective Course
P	Practical
PCC	Program Core Course
PEC	Program Elective Course
RPC	Research Project Coursework
RPR	Research Project
SBL	Skill Based Laboratory
SEC	Skill Enhancement Course
T	Tutorial
VEC	Value Education Course

B. Credit Structure

1. B. Tech in Computer Science & Engineering											
Type of Course	Semester-wise Credit Distribution									FCRIT Credit Distribution	DTE Credit Distribution
	I	II	III	IV	V	VI	VII	VIII	Total		
Basic Science Course (BSC)	08	08	--	--	--	--	--	--	16	18	14-18
Basic Science Laboratory Course (BSL)	01	01	--	--	--	--	--	--	02		
Engineering Science Course (ESC)	05	02	--	--	--	--	--	--	07	16	12-16
Engineering Science Laboratory Course (ESL)	04	05	--	--	--	--	--	--	09		
Program Core Course (PCC)	--	--	14	13	06	03	03	--	39	50	44-56
Laboratory Course (LBC)	--	--	02	03	02	02	02	--	11		
Program Elective Course (PEC)	--	--	--	--	03	03	06	03	15	15	20
Multidisciplinary Minor (MDM)	--	--	03	03	03	04	--	--	13	13	14
Multidisciplinary Laboratory Course (MDL) [†]	--	--	--	--	01	--	--	--	01	01	
Open Elective Course (OEC)	--	--	--	--	--	--	03	03	06	06	08
Skill Enhancement Course (SEC)	01	01	--	--	--	--	--	--	02	08	08
Skill Based Laboratory (SBL)	--	--	02	02	--	02	--	--	06		
Ability Enhancement Course (AEC)	--	03	--	--	02	--	--	--	05	05	04
Humanities Social Sciences and Management (HSS)	--	--	02	--	02	--	02	--	06	06	04
Indian Knowledge System (IKS)	--	02	--	--	--	--	--	--	02	02	02
Value Education Course (VEC)	02	--	--	02	--	--	--	--	04	04	04
Experiential Learning Course (ELC)	--	--	--	--	--	02	--	--	02	02	04
Mini Project (MNP)	--	--	01	01	01	01	--	--	04	10	04
Major Project (MJP)	--	--	--	--	--	--	02	04	06		
Internship (INT)	--	--	--	--	--	--	--	08	08	08	12
Liberal Learning Course (LLC)	--	--	--	--	--	02	--	--	02	02	04
Total Credits	21	22	24	24	20	19	18	18	166	166	160-176

C. Curriculum Structure and Examination Scheme for B. Tech in Computer Science & Engineering

(FY and SY with Effect from AY 2025-2026)

Curriculum Structure – FY Semester-I

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
BSC101	Engineering Mathematics I	4	--	--	4	--	--	4
BSC102	Engineering Physics-I	2	--	--	2	--	--	2
BSC103	Engineering Chemistry-I	2	--	--	2	--	--	2
ESC101	Engineering Mechanics	3	--	--	3	--	--	3
ESC102	Basic Electrical Engineering	2	--	--	2	--	--	2
BSL101	Engineering Physics-I Laboratory	--	1	--	--	0.5	--	0.5
BSL102	Engineering Chemistry-I Laboratory	--	1	--	--	0.5	--	0.5
ESL101	Engineering Mechanics Laboratory	--	2	--	--	1	--	1
ESL102	Basic Electrical Engineering Laboratory	--	2	--	--	1	--	1
ESL103	Programming Laboratory-I (C)	--	2*+2	--	--	2	--	2
SEC101	Basic Workshop Practice-I	--	2	--	--	1	--	1
VEC101	Universal Human Values	2	--	--	2	--	--	2
Total		15	12	--	15	6	--	21

* Instructions should be conducted for the entire class.

NOTE 1: Compulsory Non-Credit Activities: Participation and/or coordination of co-curricular and extra-curricular events at the Institute or Department level is mandatory for all students from semesters I to VIII as part of non-credit liberal education. Please consult the department's Curriculum Book for more information. These activities do not yield credits. Upon successful participation or organization of activities, a certificate will be awarded at the conclusion of semester VIII.

NOTE 2: Please note that during semesters I to VIII some of the non-technical courses such as Humanities Social Sciences and Management (HSS), Open Electives Course (OEC), Value Education Course (VEC), and Liberal Learning Course (LLC) may be conducted either online synchronously or asynchronously. For more information, please consult the curriculum book of department.

Examination Scheme – FY Semester-I

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuous Assessment	Mid-Sem Exam		Mid-Sem	End-Sem	
BSC101	Engineering Mathematics-I	20	30	50	1.5	2	100
BSC102	Engineering Physics-I	15	20	40	1.0	1.5	75
BSC103	Engineering Chemistry-I	15	20	40	1.0	1.5	75
ESC101	Engineering Mechanics	20	30	50	1.5	2	100
ESC102	Basic Electrical Engineering	15	20	40	1.0	1.5	75
BSL101	Engineering Physics-I Laboratory	25	--	--	--	--	25
BSL102	Engineering Chemistry-I Laboratory	25	--	--	--	--	25
ESL101	Engineering Mechanics Laboratory	25	--	--	--	--	25
ESL102	Basic Electrical Engineering Laboratory	25	--	25	--	--	50
ESL103	Programming Laboratory-I (C)	50	--	50	--	--	100
SEC101	Basic Workshop Practice-I	50	--	--	--	--	50
VEC101	Universal Human Values	50	--	--	--	--	50
Total		335	120	295	--	--	750

\$Please refer to the Curriculum Book of respective departments for guidelines on in-semester assessments for both theory and laboratory courses.

@For continuous assessment of tutorials.

Curriculum Structure – FY Semester-II

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
BSC204	Engineering Mathematics-II	4	--	--	4	--	--	4
BSC205	Engineering Physics-II	2	--	--	2	--	--	2
BSC206	Engineering Chemistry-II	2	--	--	2	--	--	2
AEC201	Professional Communication and Ethics-I	2	2	--	2	1	--	3
ESC203	Basic Electronics Engineering	2	--	--	2	--	--	2
BSL203	Engineering Physics-II Laboratory	--	1	--	--	0.5	--	0.5
BSL204	Engineering Chemistry-II Laboratory	--	1	--	--	0.5	--	0.5
ESL204	Engineering Graphics Laboratory	--	2*+2	--	--	2	--	2
ESL205	Programming Laboratory-II (Java)	--	2*+2	--	--	2	--	2
ESL206	Basic Electronics Engineering Laboratory	--	2	--	--	1	--	1
SEC202	Basic Workshop Practice-II	--	2	--	--	1	--	1
IKS201	Indian Knowledge System	2	--	--	2	--	--	2
Total		14	16	--	14	8	--	22

* Instructions should be conducted for the entire class.

Examination Scheme – FY Semester-II

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuou s Assessment t	Mid-Sem Exam		Mid-Sem	End-Sem	
BSC204	Engineering Mathematics-II	20	30	50	1.5	2	100
BSC205	Engineering Physics-II	15	20	40	1.0	1.5	75
BSC206	Engineering Chemistry-II	15	20	40	1.0	1.5	75
AEC201	Professional Communication and Ethics-I	50	--	--	--	--	50
ESC203	Basic Electronics Engineering	15	20	40	1.0	1.5	75
BSL203	Engineering Physics-II Laboratory	25	--	--	--	--	25
BSL204	Engineering Chemistry-II Laboratory	25	--	--	--	--	25
ESL204	Engineering Graphics Laboratory	50	--	50	--	--	100
ESL205	Programming Laboratory-II (Java)	50	--	50	--	--	100
ESL206	Basic Electronics Engineering Laboratory	25	--	25	--	--	50
SEC202	Basic Workshop Practice-II	50	--	--	--	--	50
IKS201	Indian Knowledge System	50	--	--	--	--	50
Total		390	90	295	--	--	775

\$Please refer to the Curriculum Book of respective departments for guidelines on in-semester assessments for both theory and laboratory courses.

@For continuous assessment of tutorials.

Curriculum Structure – SY Semester-III

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSPCC301	Engineering Mathematics-III	3	--	1	3	--	1	4
CSPCC302	Discrete Structure & Graph Theory	3	--	1	3	--	1	4
CSPCC303	Data Structures	3	--	--	3	--	--	3
CSPCC304	Database Management System	3	--	--	3	--	--	3
XXMDM301	--	3	--	--	3	--	--	3
CSLBC301	Data Structure Laboratory	--	2	--	--	1	--	1
CSLBC302	SQL Laboratory	--	2	--	--	1	--	1
CSSBL301	Python Laboratory	--	4	--	--	2	--	2
CSMNP301	Mini Project-1A	--	3	--	--	1	--	1
HSS301	Product Design	2	--	--	2	--	--	2
Total		17	11	2	17	5	2	24

NOTE:Four theory courses(Three 3-credit and one 4-credit) and one laboratory course (1-credit) offered by other department has to be taken by IT students, to complete 14-credit requirement for MDM.

Examination Scheme – SY Semester-III

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuous Assessment	Mid-Sem Exam		Mid-Sem	End - Sem	
CSPCC301	Engineering Mathematics-III	20+25@	30	50	1.5	2	125
CSPCC302	Discrete Structure & Graph Theory	20+25@	30	50	1.5	2	125
CSPCC303	Data Structure	20	30	50	1.5	2	100
CSPCC304	Database Management System	20	30	50	1.5	2	100
XXMDM301	--	20	30	50	1.5	2	100
CSLBC301	Data Structure Laboratory	25	--	25	--	--	50
CSLBC302	SQL Laboratory	25	--	25	--	--	50
CSSBL301	Python Laboratory	50	--	50	--	--	100
CSMNP301	Mini Project-1A	50	--	--	--	--	50
HSS301	Product Design	50	--	--	--	--	50
Total		350	150	350	--	--	850

\$Please refer to the Curriculum Book of department for guidelines on in-semester assessments for both theory and laboratory courses.

@For continuous assessment of tutorials.

Curriculum Structure – SY Semester-IV

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSPCC405	Engineering Mathematics-IV	3	--	1	3	--	1	4
CSPCC406	Design & Analysis of Algorithm	3	--	--	3	--	--	3
CSPCC407	Operating System	3	--	--	3	--	--	3
CSPCC408	Software Engineering	3	--	--	3	--	--	3
XXMDM402	--	3	--	--	3	--	--	3
CSLBC403	Design & Analysis of Algorithm Laboratory	--	2	--	--	1	--	1
CSLBC404	Linux Laboratory	--	2	--	--	1	--	1
CSLBC405	Software Development Laboratory	--	2	--	--	1	--	1
CSSBL402	Full stack development Laboratory	--	4	--	--	2	--	2
CSMNP402	Mini Project-1B	--	3	--	--	1	--	1
VEC402	Environment and Sustainability	2	--	--	2	--	--	2
Total		17	13	1	17	6	1	24

Examination Scheme – SY Semester-IV

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuous Assessment	Mid-Sem Exam		Mid-Sem	End-Sem	
CSPCC405	Engineering Mathematics-IV	20+25@	30	50	1.5	2	125
CSPCC406	Design & Analysis of Algorithm	20	30	50	1.5	2	100
CSPCC407	Operating System	20	30	50	1.5	2	100
CSPCC408	Software Engineering	20	30	50	1.5	2	100
XXMDM402	--	20	30	50	1.5	2	100
CSLBC403	Design & Analysis of Algorithm Laboratory	25	--	25	--	--	50
CSLBC404	Linux Laboratory	25	--	25	--	--	50
CSLBC405	Software Development Laboratory	25	--	25	--	--	50
CSSBL402	Full stack development Laboratory	50	--	50	--	--	100
CSMNP402	Mini Project-1B	50	--	50	--	--	100
VEC402	Environment and Sustainability	50	--	--	--	--	50
Total		350	150	425	--	--	925

\$Please refer to the Curriculum Book of department for guidelines on in-semester assessments for both theory and laboratory courses.

@For continuous assessment of tutorials.

Curriculum Structure – TY Semester-V

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSPCC509	Theory of Computer Science	3	--	--	3	--	--	3
CSPCC510	Computer Network	3	--	--	3	--	--	3
XXMDM503	--	3	--	--	3	--	--	3
CSPEC501Y	Program Elective Course-I	3	--	--	3	--	--	3
CSLBC506	Network Laboratory	--	2	--	--	1	--	1
CSLBC507	Cloud Computing Laboratory	--	2	--	--	1	--	1
XXMDL501	--	--	2	--	--	1	--	1
AEC502	Professional Communication and Ethics-II	1	2	--	1	1	--	2
CSMNP503	Mini Project-2A	--	3	--	--	1	--	1
HSS502	Entrepreneurship	2	--	--	2	--	--	2
Total		15	11	--	15	5	--	20

NOTE: Students who choose not to pursue Honours or Minor are welcome to register for the initial two courses of the fifth and sixth semesters' Honours or Minor track in 'Audit' mode (AU). This allows them to explore the course material without the expectation of earning a letter grade. Upon fulfilling the requirements in 'Audit' mode, their participation will be acknowledged on the grade sheet. Audit courses are excluded from grade point averages and have no impact on SGPI/CGPI calculations. For more information on Honours and Minor track courses, please refer to the Institute Handbook for Honours/Minor/Honours in Research degree programs.

Program Elective Course-I:

Students should take one PE from the following list of Program Elective Course- I.

Course Code	Program Elective Course-I
CSPEC5011	Soft Computing
CSPEC5012	Advanced Database System
CSPEC5013	Cloud Computing Services
CSPEC5014	Cyber Security
CSPEC5015	Computer graphics

Examination Scheme – TY Semester-V

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuous Assessment	Mid-Sem Exam		Mid - Sem	End-Sem	
CSPCC509	Theory of Computer Science	20	30	50	1.5	2	100
CSPCC510	Computer Network	20	30	50	1.5	2	100
XXMDM503	--	20	30	50	1.5	2	100
CSPEC501Y	Program Elective Course-I	20	30	50	1.5	2	100
CSLBC506	Network Laboratory	25	--	25	--	--	50
CSLBC507	Cloud Computing Laboratory	25	--	25	--	--	50
XXMDL501	--	25	--	25	--	--	50
AEC502	Professional Communication and Ethics-II	50	--	--	--	--	50
CSMNP503	Mini Project-2A	50	--	--	--	--	50
HSS502	Entrepreneurship	50	--	--	--	--	50
Total		305	120	275	--	--	700

\$Please refer to the Curriculum Book of department for guidelines on in-semester assessments for both theory and laboratory courses.

Curriculum Structure – TY Semester-VI

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSPCC611	Cryptography & Network Security	3		--	3	--	--	3
XXMDM604	--	4		--	4	--	--	4
CSPEC602Y	Program Elective Course-II	3	--	--	3	--	--	3
CSLBC608	Cryptography & Network Security Laboratory	--	2	--	--	1	--	1
CSLBC609	Data Science Laboratory	--	2	--	--	1	--	1
CSSBL603	Devops Laboratory	--	4	--	--	2	--	2
CSMNP604	Mini Project-2B	--	3	--	--	1	--	1
ELC601	Research Methodology	2	--	--	2	--	--	2
LLC601Y*	Liberal Learning Course	2	--	--	2	--	--	2
Total		14	11	--	14	5	--	19

NOTE: Students who choose not to pursue Honours or Minor are welcome to register for the initial two courses of the fifth and sixth semesters' Honours or Minor track in 'Audit' mode (AU). This allows them to explore the course material without the expectation of earning a letter grade. Upon fulfilling the requirements in 'Audit' mode, their participation will be acknowledged on the grade sheet. Audit courses are excluded from grade point averages and have no impact on SGPI/CGPI calculations. For more information on Honours and Minor track courses, please refer to the Institute Handbook for Honours/Minor/Honours in Research degree programs.

***Liberal Learning Course:**

Every student should take Liberal Learning Course for Semester VI. Students can take this course from the following list of Liberal Learning Courses.

Liberal Learning Courses	
Course Code	Course Name
LLC6011	Art of Living
LLC6012	Yoga and Meditation
LLC6013	Health and Wellness
LLC6014	Diet and Nutrition
LLC6015	Personality Development

Program Elective Course-II:

Students should take one PE from the following list of Program Elective Course- II.

Course Code	Program Elective Course-II
CSPEC6021	Machine Learning
CSPEC6022	Dataware housing & Mining
CSPEC6023	Wireless Technology
CSPEC6024	Ethical Hacking
CSPEC6025	System Programming and Compiler Construction

****** Students who opted the Honours/Minors vertical as Artificial Intelligence & Machine Learning should not opt Machine Learning as Program Elective-II.

Examination Scheme – TY Semester-VI

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem. Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuous Assessment	Mid-Sem Exam		Mid-Sem	End-Sem	
CSPCC611	Cryptography & Network Security	20	30	50	1.5	2	100
XXMDM604	--	20	30	50	1.5	2	100
CSPEC602Y	Program Elective Course-II	20	30	50	1.5	2	100
CSLBC608	Cryptography & Network Security Laboratory	25	--	25	--	--	50
CSLBC609	Data Science Laboratory	25	--	25	--	--	50
CSSBL603	Devops Laboratory	50	--	50	--	--	100
CSMNP604	Mini Project-2B	50	--	50	--	--	100
ELC601	Research Methodology	50	--	--	--	--	50
LLC601Y*	Liberal Learning Course	50	--	--	--	--	50
Total		310	90	300	--	--	700

\$Please refer to the Curriculum Book of department for guidelines on in-semester assessments for both theory and laboratory courses.

Curriculum Structure – B. Tech Semester-VII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSPCC712	Artificial Intelligence	3	--	--	3	--	--	3
CSPEC703Y	Program Elective Course-III	3	--	--	3	--	--	3
CSPEC704Y	Program Elective Course-IV	3	--	--	3	--	--	3
OEC701Y	Open Elective Course –I	3	--	--	3	--	--	3
CSLBC710	Artificial Intelligence Laboratory	--	2	--	--	1	--	1
CSLBC711	Data analytics & Visualization Laboratory	--	2	--	--	1	--	1
CSMJP701	Major Project-A	--	6	--	--	2	--	2
HSS703	Financial Planning	2	--	--	2	--	--	2
Total		14	10	--	14	4	--	18

Program Elective Course-III and IV:

Every student is required to take two Program Elective Course for Semester VII. Students can take this course from the following list of Program Elective Course-III and IV.

Course Code	Program Elective Course-III
CSPEC7031	Natural Language Processing
CSPEC7032	Big Data Analytics
CSPEC7033	Edge Computing
CSPEC7034	Digital Forensics
CSPEC7035	Information Retrieval System

Course Code	Program Elective Course-IV
CSPEC7041	Foundation Models & Generative AI
CSPEC7042	Time Series Analysis
CSPEC7043	Quantum Computing
CSPEC7043	Secure Software Engg.
CSPEC7044	Human Computer Interaction

Open Elective Course-I:

Every student is required to take one Open Elective Course-I for Semester VII. Students can take this course from the following list of Open Elective Course-I.

Course Code	Open Elective Course-I
OEC7011	Product Lifecycle Management
OEC7012	Reliability Engineering
OEC7013	Management Information System
OEC7014	Design of Experiments
OEC7015	Operation Research
OEC7016 @@	Cyber Security and Laws
OEC7017	Disaster Management and Mitigation Measures
OEC7018	Energy Audit and Management

@@Students opting for Honours/Minor degree in Cybersecurity or relevant domain need to select other Open Elective.

Examination Scheme – B. Tech Semester-VII

Course Code	Course Name	Examination Scheme					Total
		In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		
		Continuou s Assessment t	Mid-Sem Exam		Mid-Sem	End-Sem	
CSPCC712	Artificial Intelligence	20	30	50	1.5	2	100
CSPEC703Y	Program Elective Course-III	20	30	50	1.5	2	100
CSPEC704Y	Program Elective Course-IV	20	30	50	1.5	2	100
OEC701Y	Open Elective Course –I	20	30	50	1.5	2	100
CSLBC710	Artificial Intelligence Laboratory	25	--	25	--	--	50
CSLBC711	Data analytics & Visualization Laboratory	25	--	25	--	--	50
CSMJP701	Major Project-A	50	--	--	--	--	50
HSS703	Financial Planning	50	--	--	--	--	50
Total		230	120	250	--	--	600

\$Please refer to the Curriculum Book of department for guidelines on in-semester assessments for both theory and laboratory courses.

Curriculum Structure – B. Tech Semester-VIII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSPEC805Y	Program Elective Course-V	3	--	--	3	--	--	3
OEC802Y	Open Elective Course-II	3	--	--	3	--	--	3
CSMJP802	Major Project-B	--	12	--	--	4	--	4
INT801	Internship~	--	--	--	--	8	--	8
Total		6	12	--	6	12	--	18
~ Students have the opportunity to engage in a three-month internship within industry, research organizations, foreign universities, or internal internship for research and product development during the 8th semester, provided they meet the semester requirements and receive approval from the institute.								

Program Elective Course-V:

Every student is required to take Program Elective Course for Semester VIII. Students can choose program Elective Course-V, from one of domains listed below. The list of courses within the individual domains will be made available before the course registration.

Course Code	Program Elective Course-V
CSPEC8051	Responsible & Safe AI Systems
CSPEC8052	Recommender System
CSPEC8053	High Performance Computing
CSPEC8054	Cyber Physical Systems
CSPEC8055	Blockchain Technology

Open Elective Course-II:

Every student is required to take one Open Elective Course-II for Semester VIII. Students can take this course from the following list of Open Elective Course-II.

Course Code	Open Elective Course-II
OEC8021	Project Management
OEC8022	Finance Management
OEC8023	Entrepreneurship Development and Management
OEC8024	Human Resource Management
OEC8025	Professional Ethics and CSR
OEC8026	Circular Economy
OEC8027	IPR and Patenting
OEC8028	Digital Business Management
OEC8029	Environmental Management

Examination Scheme – B. Tech Semester-VIII

Examination Scheme							
Course Code	Course Name	In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		Total
		Continuous Assessment	Mid-Sem Exam		Mid-Sem	End-Sem	
CSPEC805Y	Program Elective Course-V	20	30	50	1.5	2	100
OEC802Y	Open Elective Course-II	20	30	50	1.5	2	100
CSMJP802	Major Project-B	50	--	50	--	--	100
INT801	Internship	50	--	50	--	--	100
Total		140	60	200	--	--	400

\$Please refer to the Curriculum Book of department for guidelines on in-semester assessments for theory, laboratory, and internship courses.

NOTE: Please note that due to the internship requirement in the VIII semester, theory courses during this semester will be conducted either online synchronously or asynchronously. For more information, please consult the curriculum book of your department.

D. Multidisciplinary Minor Courses Offered by the Department of Computer Science & Engineering for the Other Program Students

Curriculum Structure for MDM Courses

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		L	P	T	L	P	T	Total
CSMDM301	Data Structures and Algorithms	3	--	--	3	--	--	3
CSMDM402	Database Management System	3	--	--	3	--	--	3
CSMDM503	Cloud Computing	3	--	--	3	--	--	3
CSMDL501	Machine Learning Laboratory	--	2	--	--	1	--	1
CSMDM604	Soft Computing	4	--	--	4	--	--	4
Total		13	2	--	13	1	--	14

Examination Scheme for MDM Courses

Examination Scheme							
Course Code	Course Name	In-Semester Assessment\$		End Sem Exam (ESE)	Exam Duration for Theory (in Hrs)		Total
		Continuous Assessment	Mid-Sem Exam		Mid-Sem	End-Sem	
CSMDM301	Data Structures and Algorithms	20	30	50	1.5	2	100
CSMDM402	Database Management System	20	30	50	1.5	2	100
CSMDM503	Cloud Computing	20	30	50	1.5	2	100
CSMDL501	Machine Learning Laboratory	25	--	25	--	--	50
CSMDM604	Soft Computing	20	30	50	1.5	2	100
Total		105	120	225	--	--	450

E. Honours, Minor, and Honours in Research Degree Program

The Honours, Minor, and Honours in Research degree programs aim to empower students by offering specialized courses/research internships or projects in emerging fields of their interest, thus enhancing their proficiency in those areas. Students who achieve a CGPI of 7.5 or higher by the end of the fourth semester are eligible to pursue an additional 18 credits from the fifth to eighth semesters to qualify for a B. Tech degree with Honours, Minor, or Honours in Research designation. Students need to refer to the Institute level Handbook for Honours/Minor/Honours in Research Degree Programs for further details.