



RSET

RAJAGIRI SCHOOL OF
ENGINEERING & TECHNOLOGY

AUTONOMOUS

CURRICULUM (S1 – S8)

FOR

B. TECH DEGREE

IN

COMPUTER SCIENCE & ENGINEERING

(2020 ADMISSIONS)

SEMESTER I

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100908/MA100A	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
100906/PH900B	ENGINEERING PHYSICS A	3-1-0	4	4
100908/CE900C	ENGINEERING MECHANICS	2-1-0	3	3
100908/CO900F	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
100908/EN100E	LIFE SKILLS	2-0-2	4	--
100908/PH922S	ENGINEERING PHYSICS LAB	0-0-2	2	1
100908/CO922U	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL			23	17

SEMESTER II

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100908/MA200A	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
100908/CH900B	ENGINEERING CHEMISTRY	3-1-0	4	4
100908/ME900C	ENGINEERING GRAPHICS	2-0-2	4	3
100908/CO900D	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
100908/EN200E	PROFESSIONAL COMMUNICATION	2-0-2	4	--
100908/CO200F	PROGRAMMING IN C	2-1-2	5	4
100908/CH922S	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
100908/CO922T	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
TOTAL			29	21

SEMESTER III

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100902/MA300A	DISCRETE MATHEMATICAL STRUCTURES	3-1-0	4	4
100003/CS300B	DATA STRUCTURES	3-1-0	4	4
100003/CS300C	LOGIC SYSTEM DESIGN	3-1-0	4	4
100003/CS300D	OBJECT ORIENTED PROGRAMMING USING JAVA	3-1-0	4	4
100908/CO900E	DESIGN & ENGINEERING	2-0-0	2	2
100908/CO300F	SUSTAINABLE ENGINEERING	2-0-0	2	--
100003/CS322S	DATA STRUCTURES LAB	0-0-3	3	2
100003/CS322T	OBJECT ORIENTED PROGRAMMING LAB (IN JAVA)	0-0-3	3	2
TOTAL			26	22
Remedial/Minor course		3-1-0	4	4

Four hours should be kept exclusively for Remedial class/Minor course. If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER IV

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/MA400A	GRAPH THEORY	3-1-0	4	4
100003/CS400B	COMPUTER ORGANISATION AND ARCHITECTURE	3-1-0	4	4
100003/CS400C	DATABASE MANAGEMENT SYSTEMS	3-1-0	4	4
100003/CS400D	OPERATING SYSTEMS	3-1-0	4	4
100908/EN900E	PROFESSIONAL ETHICS	2-0-0	2	2
100908/ES400F	CONSTITUTION OF INDIA	2-0-0	2	--
100003/CS422S	DIGITAL LAB	0-0-3	3	2
100003/CS422T	OPERATING SYSTEMS LAB	0-0-3	3	2
TOTAL			26	22
Remedial/Minor/Honors course		3-1-0	4	4

Four hours should be kept exclusively for Remedial class/Minor course. If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER V

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS500A	FORMAL LANGUAGES AND AUTOMATA THEORY	3-1-0	4	4
100003/CS500B	COMPUTER NETWORKS	3-1-0	4	4
100003/CS500C	SYSTEM SOFTWARE	3-1-0	4	4
100003/CS500D	MICROPROCESSORS AND MICROCONTROLLERS	3-1-0	4	4
100003/CS500E	MANAGEMENT OF SOFTWARE SYSTEMS	3-0-0	3	3
100908/CE500F	DISASTER MANAGEMENT	2-0-0	2	--
100003/CS522S	SYSTEM SOFTWARE AND MICROPROCESSORS LAB	0-0-4	4	2
100003/CS522T	DATABASE MANAGEMENT SYSTEMS LAB	0-0-4	4	2
TOTAL		2-0-0	29	23
Remedial/Minor/Honors course*			4	4

Four hours should be kept exclusively for Remedial class/Minor course. If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER VI

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS600A	COMPILER DESIGN	3-1-0	4	4
100003/CS600B	COMPUTER GRAPHICS AND IMAGE PROCESSING	3-1-0	4	4
100003/CS600C	ALGORITHM ANALYSIS AND DESIGN	3-1-0	4	4
100003/CS6XXD	PROGRAM ELECTIVE I	2-1-0	3	3
100908/ES900E	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
100003/CS600F	COMPREHENSIVE COURSE WORK	1-0-0	1	1
100003/CS622S	NETWORKING LAB	0-0-3	3	2
100003/CS622T	MINIPROJECT	0-0-3	3	2
TOTAL		3-1-0	25	23
Remedial/Minor/Honors course*			4	4

Note:

Electives: This curriculum envisages to offer a learner an opportunity to earn proficiency in one of the five trending areas in Computer Science, namely Machine Learning, Data Science, Security in Computing, Formal Methods in Software Engineering and Hardware Technologies. Three courses each from the above areas are included through Elective Courses in different Elective Buckets. For example, a learner who is interested in the Machine Learning area may opt to take the elective courses - Foundations of Machine Learning from Elective-I in S6, Machine Learning from Elective-II in S7 and Deep Learning from Elective-III in S8. The Department may offer Elective Courses to enable students to utilize this opportunity, depending on the availability of faculty. The courses included from these areas under various Elective Buckets are shown in the table below.

Different Specializations introduced through various Elective Buckets				
Bucket	Specialization	Semester		
		S6	S7	S8
1	Machine Learning	FOUNDATIONS OF MACHINE LEARNING (E-I)	MACHINE LEARNING (E-II)	DEEP LEARNING (E-III)
2	Data Science	DATA ANALYTICS (E-I)	CLOUD COMPUTING (E-II)	BLOCK CHAIN TECHNOLOGIES (E-III)
3	Security in Computing	FOUNDATIONS OF SECURITY IN COMPUTING (E-I)	SECURITY IN COMPUTING (E-II)	CRYPTOGRAPHY (E-III)
4	Formal Methods in Software Engineering	AUTOMATED VERIFICATION (E- I)	MODEL BASED SOFTWARE DEVELOPMENT (E-II)	SOFTWARE TESTING (E-III)
5	Hardware Technologies	INTRODUCTION TO IA32 ARCHITECTURE (E-I)	ADVANCED TOPICS IN IA32 ARCHITECTURE (E-II)	UNIFIED EXTENDED FIRMWARE INTERFACE (E-III)

PROGRAM ELECTIVE I

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS601D	FOUNDATIONS OFMACHINE LEARNING	2-1-0	3	3
100003/CS602D	DATA ANALYTICS	2-1-0		
100003/CS603D	FOUNDATIONS OF SECURITY IN COMPUTING	2-1-0		
100003/CS604D	AUTOMATED VERIFICATION	2-1-0		
100003/CS605D	INTRODUCTION TO IA32 ARCHITECTURE	2-1-0		
100003/CS606D	PROGRAMMING IN PYTHON	2-1-0		
100003/CS607D	DATA AND COMPUTER COMMUNICATION	2-1-0		

COURSES TO BE CONSIDERED FOR COMPREHENSIVE COURSE WORK

i.	DISCRETE MATHEMATICAL STRUCTURES
ii.	DATA STRUCTURES
iii.	OPERATING SYSTEMS
iv.	COMPUTER ORGANIZATION AND ARCHITECTURE
v.	DATABASE MANAGEMENT SYSTEMS
vi.	FORMAL LANGUAGES AND AUTOMATA THEORY

NOTE:

1. Four hours should be kept exclusively for Remedial class/Minor/Honors course. If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. **Comprehensive Course Work:** The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination. Syllabus for comprehensive examination shall be prepared by the BoS choosing the above listed 6 core courses studied from semesters 3 to 5. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum.
3. **Mini project:** It is introduced in the sixth semester with a specific objective to strengthen the understanding of student's fundamentals through effective application of theoretical concepts. Mini project can help to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge. Doing more projects increases problem-solving skills. Student Groups with 3 or 4 members should identify a topic of interest in consultation with Faculty/Advisor. Review the literature and gather information pertaining to the chosen topic. State the objectives and develop a methodology to achieve the objectives. Carryout the design/fabrication or develop codes/programs to achieve the objectives. Demonstrate the novelty of the project through the results and outputs. The progress of the mini project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The product has to be demonstrated for its full design specifications. innovative design concepts, reliability considerations, aesthetics/ergonomic aspects taken care of in the project shall be given due weight. The internal evaluation will be made based on the product, the report and a viva-voce examination, conducted internally by a three-member committee appointed by Head of the Department comprising HoD or a senior faculty member, Mini Project coordinator for that program and project guide.

Total marks: 150 - CIE 75 marks and ESE 75 marks

Split up for CIE

- | | |
|--|-----------|
| a. Attendance | 10 |
| b. Project Guide | 15 |
| c. Project Report | 10 |
| d. Evaluation by the Committee (will be evaluating the level of completion and demonstration of functionality/specifications, presentation, oral examination, work knowledge and involvement) | 40 |

SEMESTER VII

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS700A	ARTIFICIAL INTELLIGENCE	2-1-0	3	3
100003/CS7XXB	PROGRAM ELECTIVE II	2-1-0	3	3
100003/CS7XXC	OPEN ELECTIVE	2-1-0	3	3
100908/ME700D	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
100003/CS722S	COMPILER LAB	0-0-3	3	2
100003/CS722T	SEMINAR	0-0-3	3	2
100003/CS722U	PROJECT PHASE I	0-0-6	6	2
TOTAL			24	15
Remedial/Minor/Honors course*		3-1-0	4	4

PROGRAM ELECTIVE II

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS701B	MACHINE LEARNING	2-1-0	3	3
100003/CS702B	CLOUD COMPUTING	2-1-0		
100003/CS703B	SECURITY IN COMPUTING	2-1-0		
100003/CS704B	MODEL BASED SOFTWARE DEVELOPMENT	2-1-0		
100003/CS705B	ADVANCED TOPICS IN IA32 ARCHITECTURE	2-1-0		
100003/CS706B	WEB PROGRAMMING	2-1-0		
100003/CS707B	NATURAL LANGUAGE PROCESSING	2-1-0		

OPEN ELECTIVE

The courses listed below are offered by the Department of COMPUTER SCIENCE & ENGINEERING for students of other undergraduate branches except Computer Science & Engineering, Information Technology and Artificial Intelligence & Data Science.

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS701C	INTRODUCTION TO MOBILE COMPUTING	2-1-0	3	3
100003/CS702C	INTRODUCTION TO DEEP LEARNING	2-1-0		
100003/CS703C	COMPUTER GRAPHICS	2-1-0		
100003/CS704C	PYTHON FOR ENGINEERS	2-1-0		
100003/CS705C	OBJECT ORIENTED CONCEPTS	2-1-0		

NOTE:

- Four hours should be kept exclusively for Remedial class/Minor/Honors course. If a student does not opt for minor/honors programme, he/she can be given remedial class.
- Seminar:** To encourage and motivate the students to read and collect recent and reliable information about their area of interest confined to the relevant discipline, from technical publications including peer reviewed journals, conferences, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance	10
Seminar Guide	20
Technical Content of the Report	30

Presentation**40**

3. **Project Phase-I:** A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The objective of Project Work Phase-I is to enable the student to take up investigative study in the broad field of Computer Science and Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department for a group of three/four students, under the mentoring of a Project Guide(s). This is expected to provide a good initiation for the student(s) in R&D work. The assignment shall normally include:

- Survey and study of published literature on the assigned topic.
- Preparing an action plan for conducting the investigation, including teamwork.
- Working out a preliminary approach to the problem relating to the assigned topic.
- Block level design documentation.
- Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/Feasibility.
- Preparing a written report on the study conducted for presentation to the department.
- Final project presentation before the concerned departmental committee.

Total marks: 100, only CIE, minimum required to pass 50

Project Guide(s)	30
Interim evaluation by the evaluation committee	20
Final project presentation	30
Final evaluation by the evaluation committee	20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project guide(s).

SEMESTER VIII

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS800A	DISTRIBUTED COMPUTING	2-1-0	3	3
100003/CS8XXB	PROGRAM ELECTIVE III	2-1-0	3	3
100003/CS8XXC	PROGRAM ELECTIVE IV	2-1-0	3	3
100003/CS8XXD	PROGRAM ELECTIVE V	2-1-0	3	3
100003/CS800T	COMPREHENSIVE COURSE VIVA	1-0-0	1	1
100003/CS822U	PROJECT PHASE II	0-0-12	12	4
TOTAL			25	17
Remedial/Minor/Honors course		3-1-0	4	4

PROGRAM ELECTIVE III

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS801B	DEEP LEARNING	2-1-0	3	3
100003/CS802B	PROGRAMMING PARADIGMS	2-1-0		
100003/CS803B	CRYPTOGRAPHY	2-1-0		
100003/CS804B	SOFT COMPUTING	2-1-0		
100003/CS805B	FUZZY SET THEORY AND APPLICATIONS	2-1-0		
100003/CS806B	EMBEDDED SYSTEMS	2-1-0		
100003/CS807B	COMPUTER VISION	2-1-0		

PROGRAM ELECTIVE IV

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS801C	FORMAL METHODS AND TOOLS IN SOFTWARE ENGINEERING	2-1-0	3	3
100003/CS802C	CLIENT SERVER ARCHITECTURE	2-1-0		
100003/CS803C	PARALLEL COMPUTING	2-1-0		
100003/CS804C	DATA COMPRESSION TECHNIQUES	2-1-0		
100003/CS805C	UNIFIED EXTENDED FIRMWARE INTERFACE	2-1-0		
100003/CS806C	DATA MINING	2-1-0		
100003/CS807C	MOBILE COMPUTING	2-1-0		

PROGRAM ELECTIVE V

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
100003/CS801D	HIGH PERFORMANCE COMPUTING	2-1-0	3	3
100003/CS802D	BLOCK CHAIN TECHNOLOGIES	2-1-0		
100003/CS803D	IMAGE PROCESSING TECHNIQUE	2-1-0		
100003/CS804D	INTERNET OF THINGS	2-1-0		
100003/CS805D	SOFTWARE TESTING	2-1-0		
100003/CS806D	BIOINFORMATICS	2-1-0		
100003/CS807D	COMPUTATIONAL LINGUISTICS	2-1-0		

NOTE:

1. Four hours should be kept exclusively for Remedial class/Minor/Honors course. If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. Comprehensive Viva Voce: The comprehensive viva voce in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core

subjects studied from third to eighth semester. The viva voce will be conducted by the same three-member committee assigned for final project phase II evaluation towards the end of the semesters. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.

3. **Project Phase II:** The objective of Project Work Phase II & Dissertation is to enable the student to extend further the investigative study taken up in Project Phase I, either fully theoretical/practical or involving both theoretical and practical work, under the mentoring of a Project Guide from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment shall normally include:
- In depth study of the topic assigned in the light of the report prepared in Phase I.
 - Review and finalization of the approach to the problem relating to the assigned topic.
 - Detailed Analysis/Modeling/Simulation/Design/Problem Solving/Experiment as needed.
 - Final development of product/process, testing, results, conclusions and future directions.
 - Preparing a paper for Conference presentation/Publication in Journals, if possible.
 - Preparing a Dissertation in the standard format for being evaluated by the department.
 - Final Presentation before the concerned evaluation committee.

Total marks: 150, only CIE, minimum required to pass 75

Project Guide 30

Interim evaluation, twice in the semester by the evaluation committee 70

Quality of the report evaluated by the above committee 10

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project guide).

Final evaluation by a three member committee 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

**CURRICULUM
FOR
B. TECH DEGREE
IN
XXXXXXX
WITH
MINOR IN
COMPUTER SCIENCE &
ENGINEERING
(2020 ADMISSIONS)**

B. TECH WITH MINOR

Minor is an additional credential a student may earn if she/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist bucket of 3-6 courses is identified for each Minor. Each bucket may rest on one or more foundation courses. A bucket may have sequences within it, i.e., advanced courses may rest on basic courses in the bucket. She/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx with Minor in Computer Science & Engineering”. The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

- i. The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by M slot courses.
- ii. Registration is permitted for Minor at the beginning of third semester. Total credits required to award B. Tech with Minor is 182 (162 + 20)
- iii. Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of Studies and approved by the Academic Council or 2 courses from the minor buckets listed here. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.
- iv. There won't be any supplementary examination for the courses chosen for Minor.
- v. On completion of the program, “Bachelor of Technology in xxx with Minor in Computer Science & Engineering” will be awarded if the registrant earn 20 credits from the minor courses.
- vi. The registration for minor program will commence from semester 3 and all the academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 5 buckets. The bucket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the bucket. Reshuffling of courses between various buckets will not be allowed. There is option to skip any two courses listed here and to opt for equivalent MOOC courses approved by the Academic

Council. In any case, they should carry out a mini project based on the chosen area in S7 or S8. For example: Students who have registered for B. Tech Minor in Computer Science & Engineering can opt to study the courses listed below:

SEMESTER	BASKET 1 (SPECIALIZATION - SOFTWARE ENGINEERING)			
	Course Code	Course Name	Hours	Credits
S3	100905/CS301M	OBJECT ORIENTED PROGRAMMING	4	4
S4	100905/CS401M	PROGRAMMING METHODOLOGIES	4	4
S5	100905/CS501M	CONCEPTS IN SOFTWARE ENGINEERING	4	4
S6	100905/CS601M	INTRODUCTION TO SOFTWARE TESTING	4	4
S7	100905/CS922M	MINIPROJECT	4	4
S8	100905/CS922M	MINIPROJECT	4	4

SEMESTER	BASKET 2 (SPECIALIZATION - MACHINE LEARNING)			
	Course Code	Course Name	Hours	Credits
S3	100905/CS302M	PYTHON FOR MACHINE LEARNING	4	4
S4	100905/CS402M	MATHEMATICS FOR MACHINE LEARNING	4	4
S5	100905/CS502M	CONCEPTS IN MACHINE LEARNING	4	4
S6	100905/CS602M	CONCEPTS IN DEEP LEARNING	4	4
S7	100905/CS922M	MINIPROJECT	4	4
S8	100905/CS922M	MINIPROJECT	4	4

SEMESTER	BASKET 3 (SPECIALIZATION - NETWORKING)			
	Course Code	Course Name	Hours	Credits
S3	100905/CS303M	DATA COMMUNICATION	4	4
S4	100905/CS403M	INTRODUCTION TO COMPUTER NETWORKS	4	4
S5	100905/CS503M	CLIENT SERVER SYSTEMS	4	4
S6	100905/CS603M	WIRELESS NETWORKS AND IOT APPLICATIONS	4	4
S7	100905/CS922M	MINIPROJECT	4	4
S8	100905/CS922M	MINIPROJECT	4	4

Note-1: Name of the specialization shall be mentioned in the Minor Degree to be awarded

Note-2: Any B. Tech students from non-Computer Science/non-IT streams can register for the courses in the minor buckets.

**CURRICULUM
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HONORS

Honors is an additional credential a student may earn if she/he opts for the extra 20 credits needed for this in her/his own discipline. Honors is not indicative of a class. This option is provided for academically extra brilliant students to acquire Honors. Honors is intended for a student to gain expertise/get specialized in an area inside his/her major B. Tech discipline and to enrich knowledge in emerging/advanced areas in the concerned branch of engineering. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honors, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as “Bachelor of Technology in Computer Science & Engineering, with Honors.” The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If a student is not earning credits for any one of the specified course for getting Honors, she/he is not entitled to get Honors. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 buckets, each bucket representing a particular specialization in the branch. The students shall select only the courses from same bucket in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honors courses shall be identified by H slot courses.

- i. The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The Honors courses shall be identified by H slot courses.
- ii. Registration is permitted for Honors at the beginning of fourth semester. Total credits required is 182 (162 + 20).
- iii. Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of studies and approved by the Academic Council or 2 courses from the same bucket as the above 3 courses. The classes for Honors shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of ‘C’ or better for all courses under Honors.
- iv. There won’t be any supplementary examination for the courses chosen for Honors.
- v. On successful accumulation of credits at the end of the programme, “Bachelor of Technology in Computer Science & Engineering, with Honors” will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of ‘C’ or better for all courses chosen for Honors and there is no history of ‘F’ Grade in the entire span of the B. Tech Course.
- vi. The registration for Honors program will commence from semester 4 and all the academic units offering Honors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 5 buckets, each bucket representing a particular specialization in the branch. The students shall select only the courses from same bucket

in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. There is option to skip any two courses listed here if required, and to opt for equivalent MOOC courses approved by the Academic Council. In any case, they should carry out a mini project based on the chosen area in S8. For example: Students who have registered for B. Tech in Computer Science and Engineering with Honors can opt to study the courses listed in one of the buckets shown below:

SEMESTER	BUCKET 1 (Specialization - Security in Computing)				BUCKET 2 (Specialization - Machine Learning)				BUCKET 3 (Specialization - Formal Methods)			
	Course No	Course Name	Hours	Credits	Course No	Course Name	Hours	Credits	Course No	Course Name	Hours	Credits
S4	100003/CS401H	NUMBER THEORY	4	4	100003/CS402H	COMPUTATIONAL FUNDAMENTALS FOR MACHINE LEARNING	4	4	100003/CS403H	PRINCIPLES OF PROGRAM ANALYSIS AND VERIFICATION	4	4
S5	100003/CS501H	CRYPTOGRAPHIC ALGORITHMS	4	4	100003/CS502H	NEURAL NETWORKS AND DEEP LEARNING	4	4	100003/CS503H	PRINCIPLES OF MODEL CHECKING	4	4
S6	100003/CS601H	NETWORK SECURITY	4	4	100003/CS602H	ADVANCED TOPICS IN MACHINE LEARNING	4	4	100003/CS603H	THEORY OF COMPUTABILITY AND COMPLEXITY	4	4
S7	100003/CS701H	CYBER FORENSICS	4	4	100003/CS702H	ADVANCED TOPICS IN ARTIFICIAL INTELLIGENCE	4	4	100003/CS703H	LOGIC FOR COMPUTER SCIENCE	4	4
S8	100003/CS822H	MINIPROJECT	4	4	100003/CS822H	MINIPROJECT	4	4	100003/CS822H	MINIPROJECT	4	4

Note: Name of the specialization shall be mentioned in the Honors Degree to be awarded