

Programme Specifications

B. Tech. Programme



**Programme: Computer Science &
Engineering**
Department: Computer Science & Engineering

Faculty of Engineering & Technology
M. S. Ramaiah University of Applied Sciences

University House, New BEL Road, MSR Nagar, Bangalore – 560 054

www.msruas.ac.in

PROGRAMME SPECIFICATIONS: COMPUTER SCIENCE AND ENGINEERING

Faculty	Engineering and Technology (FET)
Department	Computer Science and Engineering
Programme	Computer Science and Engineering
Dean of Faculty	Prof. M. Arulanantham
Head of Department	Prof. Raghavendra V. Kulkarni

1	Title of the Award B. Tech. in Computer Science and Engineering
2	Modes of Study Full Time
3	Awarding Institution /Body M. S. Ramaiah University of Applied Sciences
4	Joint Award Not Applicable
5	Teaching Institution Faculty of Engineering and Technology, M.S. Ramaiah University of Applied Sciences
6	Date of Programme Specifications April 2018
7	Date of Programme Approval by the Academic Council of MSRUAS June 2018
8	Next Review Date: March 2022
9	Programme Approving Regulating Body and Date of Approval --
14	<p>Rationale for the Programme</p> <p>Computing and information technologies have not only touched all aspects of human existence but are also helping drive all modern human endeavours, most notably science and engineering practice. Advances in Computer Science and Engineering (CSE) field are enabling several disciplines such as intelligent systems, data science, bioinformatics, nanotechnology and interactive virtual worlds. It is also contributing to methodological advances in most fields of study: from computational proofs of mathematical theorems through simulation based studies of physical, biological and engineering systems to virtual reality based psychology experiments. Algorithms and computing systems are responsible for the Artificial Intelligence (AI) and data driven revolution and processing voluminous data in all spheres of engineering, simulation of earth climatic models and social networking sites, among many others. As a consequence, the field of CSE is dynamic and constantly evolving.</p> <p>These diverse and demanding applications generate a constant demand for CSE professionals able to analyse and develop appropriate abstractions of the problems to be addressed, design appropriate architectures and components, implement as well as deploy solutions. While it has commonalities with other Engineering disciplines, CSE is unique due to the fact that every final product (software) is largely handcrafted. Thus, an undergraduate programme in CSE should lay a strong and balanced foundation as well as the ability to synthesise working systems. Students have to be thorough in the underlying principles as well as the practical aspects of modern computing systems and information infrastructure preparing them for a career in the challenging and dynamic field.</p> <p>The Computer Science and Engineering programme at Faculty of Engineering and Technology at MSRUAS has been developed by the members of the faculty based on their teaching experience and long standing interactions with various universities and industries in India and abroad.</p>

	<p>The curriculum is outcome based and helps students to develop critical thinking abilities and imbibe relevant practical skills for a smooth transition from academics to real-life work environment. Opportunities are provided for the students to do their internship in India or abroad depending on their preferences.</p> <p>While most engineering colleges and universities across the world offer a CSE degree (or its equivalent), there is a shortage in quality graduates. The CSE programme is designed to produce creative and knowledgeable engineers with capabilities to innovate, design and develop computing and information technology solutions for diverse requirements of society, environment and human endeavours.</p>
10	<p>Programme Accredited Body and Date of Accreditation</p> <p>--</p>
11	<p>Grade Awarded by the Accreditation Body</p> <p>--</p>
12	<p>Programme Accreditation Validity</p> <p>--</p>
13	<p>Programme Benchmark</p> <p>N/A</p>
15	<p>Programme Mission</p> <p>The purpose of the programme is creation of innovative problem solvers in multi-disciplinary settings, entrepreneurs and leaders applying the knowledge, understanding, cognitive abilities, practical skills and transferrable skills gained through systematic, flexible and rigorous learning in the chosen academic domain</p>
16	<p>Graduate Attributes</p> <ol style="list-style-type: none"> 1. Ability to apply knowledge of mathematics, science, and Engineering fundamentals to solve complex problems in engineering 2. Ability to analyse engineering problems, interpret data and arrive at meaningful conclusions involving mathematical inferences 3. Ability to design an engineering system, component, or process to meet desired needs considering public health and safety, and the cultural, societal, and environmental considerations 4. Ability to understand and solve complex engineering problems by conducting experimental investigations 5. Ability to apply appropriate tools and techniques and understand utilization of resources appropriately to complex engineering activities 6. Ability to understand the effect of engineering solutions on legal, cultural, social and public health and safety aspects 7. Ability to develop sustainable solutions and understand their effect on society and environment 8. Ability to apply ethical principles to engineering practices and professional responsibilities 9. Ability to work as a member of a team, to plan and to integrate knowledge of various engineering disciplines and to lead teams in multidisciplinary settings 10. Ability to make effective oral presentations and communicate technical ideas to a broad audience using written and oral means 11. Ability to lead and manage multidisciplinary teams by applying engineering and management principles 12. Ability to adapt to the changes and advancements in technology and engage in independent and life-long learning
17	<p>Programme Goal</p> <p>The programme goal is to produce graduates with critical, analytical and problem solving skills, and ability to think independently, to pursue a career in Computer Science and Engineering.</p>
18	<p>Programme Objectives</p> <p>The programme will impart knowledge of computing and information technology systems and their sub systems; develop understanding of underlying logical, algorithmic, architectural and programming principles of computer science and engineering; teach modelling, simulation and analysis to study</p>

	<p>the performance of computing systems and develop the ability to design, build and test modern computing systems. It also trains students on personal development and interactive skills with professionals and feel for society.</p> <p>The objectives of the programme are:</p> <ol style="list-style-type: none"> 1. To facilitate the acquisition of knowledge in computing and information technology systems and their subsystems 2. To develop understanding of the underlying logical, algorithmic, architectural and programming principles of computing systems 3. To build the ability to design and implement computing and information systems to meet the specific application needs 4. To model, simulate and analyse the behaviour of computing and information systems to predict and improve their performance 5. To train students on development of software products to meet specific requirements and customer needs 6. To impart training on the processes and practice of engineering, deployment and operation of information technology infrastructure 7. To impart training on professional ethics, history, economics, social sciences and interactive skills relevant to professional practice 8. To provide a general perspective on lifelong learning and opportunities for a career in industry, business and commerce
19	<p>Programme Intended Learning Outcomes</p> <p>The intended learning outcomes are listed under four headings:</p> <ol style="list-style-type: none"> 1. Knowledge and Understanding, 2. Cognitive skills 3. Practical skills and 4. Capability / Transferable skills. <p>Knowledge and Understanding</p> <p>After undergoing this programme, a student will be able to</p> <p>KU1: Identify and describe the various algorithms, architectures, programming paradigms and systems relevant to Computer Science and Engineering</p> <p>KU2: Explain the underlying logical and engineering principles that govern the Computer Science and Engineering systems/processes</p> <p>KU3: Compare and contrast newer approaches and technologies with the existing ones</p> <p>KU4: Understand the impact of engineering solution and accept professional, ethical, social, legal and economic responsibilities</p> <p>Cognitive Skills</p> <p>After undergoing this programme, a student will be able to</p> <p>CS1: Design and synthesise algorithms, architectures and software for computing and information technology systems</p> <p>CS2: Model, simulate and analyse the computing and information technology systems</p> <p>CS3: Modify the existing algorithms, architectures and programs to meet newer requirements</p> <p>CS4: Apply scientific and engineering principles to evaluate computing systems and answer what if questions</p> <p>Practical Skills</p> <p>After undergoing this programme, a student will be able to</p> <p>PS1: Use the facilities of CASE tools and IDEs for software development life cycle activities</p> <p>PS2: Employ appropriate tools for development and measurement of scientific and engineering systems</p> <p>PS3: Deploy and configure standalone and distributed computing and information technology infrastructure</p>

	<p>PS4: Operate computing, networking and information technology systems</p> <p>Capability Skills / Transferrable Skills</p> <p>After undergoing the programme, a student will be able to-</p> <p>TS1: Manage information, develop technical reports and make presentations</p> <p>TS2: Build, Manage and Lead a team to successfully complete a project and communicate across teams and organizations to achieve professional objectives</p> <p>TS3: Work under various constraints to meet project targets</p> <p>TS4: Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy</p>
20	Programme Structure

B. Tech. Programme Structure**Physics Cycle:****SEMESTER 1**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18BSC101A	Engineering Mathematics - 1	3	2	0	4	100
2	18BSC102A	Engineering Physics	3	2	0	4	100
3	18ESC101A	Elements of Mechanical Engineering	3	0	0	3	100
4	18ESC102A	Elements of Electronics Engineering	3	2	0	4	100
5	18ESC103A	Engineering Drawing	1	0	4	3	100
6	18BSL103A	Engineering Physics Laboratory	0	0	2	1	50
7	18ESL104A	Basic Workshop Practice	0	0	2	1	50
8	18ESL105A	Basic Electronics Laboratory	0	0	2	1	50
9	18HST101A	Elements of Social Sciences	2	0	0	2	50
Total			15	6	10	23	700
Total number of contact hours per week			31 hours				
Number of credits can be registered			Minimum	18	Maximum	23	

SEMESTER 2

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18BSC104A	Engineering Mathematics - 2	3	2	0	4	100
2	18BSC105A	Engineering Chemistry	3	0	0	3	100
3	18ESC106A	Engineering Mechanics and Construction Materials	3	2	0	4	100
4	18ESC107A	Elements of Electrical Engineering	3	2	0	4	100
5	18ESC108A	Elements of Computer Science and Engineering	3	2	0	4	100
6	18ESL109A	Computer Programming Laboratory	0	0	2	1	50
7	18BSL106A	Engineering Chemistry Laboratory	0	0	2	1	50
8	18ESL110A	Basic Electrical Engineering Laboratory	0	0	2	1	50
9	18HST102A	Professional Communication	2	0	0	2	50
Total			17	8	6	24	700
Total number of contact hours per week			31 hours				
Number of credits can be registered			Minimum	19	Maximum	24	

Chemistry Cycle:**SEMESTER 1**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18BSC101A	Engineering Mathematics - 1	3	2	0	4	100
2	18BSC105A	Engineering Chemistry	3	0	0	3	100
3	18ESC106A	Engineering Mechanics and Construction Materials	3	2	0	4	100
4	18ESC107A	Elements of Electrical Engineering	3	2	0	4	100
5	18ESC108A	Elements of Computer Science and Engineering	3	2	0	4	100
6	18ESL109A	Computer Programming Laboratory	0	0	2	1	50
7	18BSL106A	Engineering Chemistry Laboratory	0	0	2	1	50
8	18ESL110A	Basic Electrical Engineering Laboratory	0	0	2	1	50
9	18HST102A	Professional Communication	2	0	0	2	50
Total			17	8	6	24	700
Total number of contact hours per week			31 hours				
Number of credits can be registered			Minimum	19	Maximum	24	

SEMESTER 2

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18BSC104A	Engineering Mathematics - 2	3	2	0	4	100
2	18BSC102A	Engineering Physics	3	2	0	4	100
3	18ESC101A	Elements of Mechanical Engineering	3	0	0	3	100
4	18ESC102A	Elements of Electronics Engineering	3	2	0	4	100
5	18ESC103A	Engineering Drawing	1	0	4	3	100
6	18BSL103A	Engineering Physics Laboratory	0	0	2	1	50
7	18ESL104A	Basic Workshop Practice	0	0	2	1	50
8	18ESL105A	Basic Electronics Laboratory	0	0	2	1	50
9	18HST101A	Elements of Social Sciences	2	0	0	2	50
Total			15	6	10	23	700
Total number of contact hours per week			31 hours				
Number of credits can be registered			Minimum	18	Maximum	23	

SEMESTER 3

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18BSC207A	Engineering Mathematics - 3	3	2	0	4	100
2	18CSC201A	Discrete Mathematics	3	2	0	4	100
3	18CSC202A	Data Structures and Algorithms	3	2	0	4	100
4	18CSC203A	Logic Design	3	0	0	3	100
5	18CSC210A	Software Development Fundamentals	3	0	0	3	100
6	18CSL205A	Data Structures and Algorithms Laboratory	0	0	2	1	50
7	18CSL206A	Logic Design Laboratory	0	0	2	1	50
8	18CSL213A	Software Development Laboratory	0	0	2	1	50
9	18CEN201A	Environmental Studies	2	0	0	2	50
Total			17	6	6	23	700
Total number of contact hours per week			29 hours				
Number of credits can be registered			Minimum	18	Maximum	23	

SEMESTER 4

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18BSC208A	Engineering Mathematics - 4	3	2	0	4	100
2	18ECC214A	Fundamentals of Signals and Systems	3	2	0	4	100
3	18CSC208A	Computer Organisation and Architecture	3	0	0	3	100
4	18CSC209A	Design and Analysis of Algorithms	3	2	0	4	100
5	18CSC204A	Programming Paradigms	3	2	0	4	100
6	18CSC211A	Formal Languages and Automata Theory	3	0	0	3	100
7	18CSL207A	Programming Paradigms Laboratory	0	0	2	1	50
8	18CSL214A	Microprocessor and Assembly Programming Laboratory	0	0	2	1	50
9	18HST201A	Constitution, Human Rights and Law	2	0	0	2	50
Total			20	8	4	26	750
Total number of contact hours per week			32 hours				
Number of credits can be registered			Minimum	21	Maximum	26	

SEMESTER 5

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18CSC301A	Graph Theory and Optimisation	3	2	0	4	100
2	18CSC304A	Digital Communication	3	2	0	4	100
3	18CSC302A	Operating Systems	3	0	0	3	100
4	18CSC303A	Computer Networks	3	0	0	3	100
5	18CSC305A	Programming Language Principles	3	2	0	4	100
6	18CSC311A	Database Systems	3	2	0	4	100
7	18CSL306A	Operating Systems Laboratory	0	0	2	1	50
8	18CSL307A	Computer Networks Laboratory	0	0	2	1	50
9	18CSL313A	Database Systems Laboratory	0	0	2	1	50
10	18CSC306A	Economics and Cost Estimation in Computer Engineering	3	0	0	3	50
Total			21	8	6	28	800
Total number of contact hours per week			35 hours				
Number of credits can be registered			Minimum	23	Maximum	28	

SEMESTER 6

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18CSC310A	Compilers	3	2	0	4	100
2	18CSC308A	Artificial Intelligence	3	2	0	4	100
3	18CSC314A	Concurrent and Distributed Computing	3	2	0	4	100
4	18CSC313A	Web Architecture and Application Development	3	2	0	4	100
5	18CSC315A	Information Security and Protection	3	2	0	4	100
6	18CSC309A	Computer Graphics	3	2	0	4	100
7	18CSL312A	Compilers Laboratory	0	0	2	1	50
8	18CSL316A	Artificial Intelligence Laboratory	0	0	2	1	50
9	18CSL317A	Web Architecture and Application Development Laboratory	0	0	2	1	50
Total			18	12	6	27	750
Total number of contact hours per week			36 hours				
Number of credits can be registered			Minimum	22	Maximum	27	

SEMESTER 7

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18CSE41XA	Professional Core Elective - 1	3	2	0	4	100
2	18CSE42XA	Professional Core Elective - 2	3	2	0	4	100
3	18CSC43XA	Professional Core Elective - 3	3	2	0	4	100
4	18OEE41XA	Open Elective - 1	3	0	0	3	100
5	18OEE41XA	Open Elective - 2	3	0	0	3	100
6	I]18CSPI41A II]18CSPI42A	I] Project Work - 1 II] Internship (Choose one)	0	0	16	8	100
7	18CSC401A	Seminar	0	0	2	1	50
Total			15	6	18	27	650
Total number of contact hours per week			39 hours				
Number of credits can be registered			Minimum	22	Maximum	27	

SEMESTER 8

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18CSE44XA	Professional Core Elective - 4	3	2	0	4	100
2	18OEE41XA	Open Elective - 3	3	0	0	3	100
3	18OEE41XA	Open Elective - 4	3	0	0	3	100
4	18CSP43A	Project Work - 2	0	0	24	12	100
Total			9	2	24	22	400
Total number of contact hours per week			35 hours				
Number of credits can be registered			Minimum	17	Maximum	22	

Professional Core Elective Courses:

Group	VII Sem			VIII Sem
	PCE-1 Course Name	PCE-2 Course Name	PCE-3 Course Name	PCE-4 Course Name
Machine Learning	18CSE412A: Neural Networks and Deep Learning Algorithms	18CSE422A: Computational Intelligence	18CSE432A: Pattern Recognition and Machine Learning	I] 18CSE441A: Data Analytics II] 18CSE443A: Data Visualisation (Choose one)
Data Engineering	18CSE413A: Data Modelling and Representation	I] 18CSE423A: Python for Data Science II] 18CSE424A: R for Data Science III] 18CSE425A: Grid and Cloud Computing (Choose one)	I] 18CSE433A: Data Processing II] 18CSE432A: Pattern Recognition and Machine Learning (Choose one)	18CSE441A: Data Analytics
Enterprise Computing	18CSE414A: Software Engineering	18CSE425A: Grid and Cloud Computing	18CSE434A: Principles and Practices of Software Testing	18CSE444A: Enterprise Computing
Theoretical Computer Science	18CSE415A: Applied Formal Methods	18CSE426A: Principles and Practices of Cryptography	18CSE435A: Quantum Computing	18CSE445A: Theory of Computation
Embedded Systems and IoT	18CSE416A: Real-Time Embedded Systems	18CSE427A: Embedded Computer Architecture and Programming	18CSE436A: Connected Devices	18CSE446A: Advanced Computer Architecture
Computer Networks	18CSE417A: Network Programming & Simulation	18CSE426A: Principles and Practices of Cryptography II] 18CSE428A: Statistical Detection and Estimation (Choose one)	I] 18CSE437A: Wireless Networks II] 18CSE438A: Signal and Image Processing Algorithms (Choose one)	I] 18CSE447A: Multimedia Systems II] 18CSE448A: Mobile Computing (Choose one)
Common Group	18BSE401A: Probability and Statistics	18CSE421A: Data Science-Foundation	18CSE431A: Data Science Algorithms and Applications	18CSE441A: Data Analytics

21	Programme Delivery As per the time Table
22	Teaching and Learning Methods <ol style="list-style-type: none"> 1. Face to Face Lectures using Audio-Visuals 2. Workshops-Group Discussions, Debates, Presentations 3. Demonstrations 4. Guest Lectures 5. Laboratory-work/Field work/workshop 6. Industry Visit 7. Seminars 8. Group Exercises 9. Project work 10. Project Exhibitions 11. Technical Festivals

23	<p>Assessment and Grading</p> <ol style="list-style-type: none"> 1. Every course will be assessed for a weight of 100 2. There are two components-Component-1 and Component-2 3. Component-1 carries a weight of 50% and Component -2 carries a weight of 50% 4. Component -1 (CE) is subdivided into Term Tests and Assignments, tests carry 25% weight and assignment carry 25% weight. 5. Component -2 is a written examination (SEE) carries 50% weight 6. Laboratory Examination will have two components 7. Component -1(CE): Conduction of Laboratory Exercises and Submission of Report: 50% weight 8. Component -2: SEE (Semester End Laboratory Examination): 50% weight 9. A minimum of overall 40% is required for a pass with 40% in each of the Components 10. The marks distribution for each course is given in the programme structure- section 20 11. Other flexibilities (exceptions) are as per the Academic Regulations of B. Tech. Programme.
24	<p>Attendance</p> <p>A minimum of 85% attendance is compulsory to appear for semester end examinations. Condoning of attendance shortage is as per the Academic Regulations of B.Tech. Programme.</p>
25	<p>Award of Class</p> <p>As per the Academic Regulations of B.Tech. Programme</p>
26	<p>Student support for Learning</p> <ol style="list-style-type: none"> 1. Course Notes 2. Reference Books in the Library 3. Magazines and Journals 4. Internet Facility 5. Computing Facility 6. Laboratory Facility 7. Workshop facility 8. Staff support 9. Lounges for Discussions 10. Any other support that enhances their learning
27	<p>Quality Control Measures</p> <ol style="list-style-type: none"> 1. Review of Course Notes 2. Review of Question Papers and Assignment Questions 3. Student Feedback 4. Moderation of assessed work 5. Opportunities for students to see their assessed work 6. Review by external examiners and external examiners reports 7. Staff Student Consultative Committee meetings 8. Student exit feedback 9. Subject Assessment Board (SAB) 10. Programme Assessment Board (PAB)

28 Curriculum Map					Intended Learning Outcomes											
Course Code					Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving)				Practical skills			
					KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4
HST/CN	BS	ES/EC	CS	OEE												
a	b	c	d	e												
101A	C101A	C101A	C201A			bcd		abcd		d		bd		bcd		
102A	C102A	C102A	C202A		cd	bcd	d	abcd	d	d	d	bd	d	bcd		
CEN201A	L103A	C103A	C203A		d	bcd		abcd	d	d	a	bd	d	bcd		
201A	L106A	L104A	C210A		d	bcd	d	abcd	d	d	d	bd	d	bcd	d	d
	C104A	L105A	L205A		cd	bcd	d	bcd	d	d	d	bd	d	bcd		
	C105A	C106A	L206A		d	bcd		bcd	d	d		bd	d	bcd		
	C207A	C107A	L213A		cd	bcd	d	bcd	d	d	d	bd	d	bcd	d	d
	C208A	C108A	C208A		cd	bcd	d	bcd	cd	cd	cd	bcd	d	bcd		
	C401A	L109A	C209A		cd	bcd	d	bcd	cd	cd	cd	bcd	d	b		
		L110A	C204A		cd	cd		cd	d	d		d	d	d	d	d
		C214A	C211A		d	cd	d	cd	d	cd	cd	cd	d	c		
			L207A		d	d		d	d	d		d	d	d	d	d
			L214A		d	d		d	d	d		d	d	d		
			C301A		d	d		d	d	d				d		
			C304A		d	d	d	d	d	d	d	d	d	d		
			C302A		d	d	d	d	d	d	d	d	d	d	d	d
			C303A		d	d		d	d	d		d	d	d	d	d
			C305A		d	d	d	d	d	d	d	d	d	d		
			C311A		d	d	d	d	d	d	d	d	d	d	d	d
			L306A		d	d		d	d	d		d	d	d	d	d
			L307A		d	d		d	d	d		d	d	d	d	d
			L313A		d	d	d	d	d	d	d	d	d	d	d	d
			C306A				d	d				d				
			C310A		d	d		d	d	d		d	d	d		
			C308A		d	d	d	d	d	d	d	d	d	d		
			C314A		d	d	d	d	d	d	d	d	d	d	d	d
			C313A		d	d	d	d	d	d	d	d	d	d	d	D
			C315A		d	d	d	d	d	d	d	d	d	d	d	d
			C309A		d	d		d	d	d		d	d	d		
			L312A		d	d		d	d	d		d	d	d		
			L316A		d	d		d	d	d		d	d	d		
			L317A		d	d	d	d	d	d	d	d	d	d	d	d
			E412A		d	d	d	d	d	d	d	d	d	d		
			E413A		d	d	d	d	d	d	d	d	d	d		
			E414A		d	d	d	d	d	d	d	d	d	d	d	d
			E415A		d	d	d	d	d	d	d	d	d	d		
			E416A		d	d		d	d	d		d	d	d		
			E417A		d	d	d	d	d	d	d	d	d	d		
			E422A		d	d	d	d	d	d	d	d	d	d		
			E423A		d	d	d	d	d	d	d	d	d	d	d	
			E424A		d	d	d	d	d	d	d	d	d	d	d	
			E425A		d	d	d	d	d	d	d	d	d	d	d	d
			E426A		d	d	d	d	d	d	d	d	d	d	d	
			E427A		d	d	d	d	d	d	d	d	d	d	d	
			E428A		d	d	d	d	d	d	d	d	d	d		
			E421A		d	d	d	d	d	d	d	d	d	d		
			E432A		d	d	d	d	d	d	d	d	d	d		
			E433A		d	d	d	d	d	d	d	d	d	d		
			E434A		d	d	d	d	d	d	d	d	d	d		
			E435A		d	d	d	d	d	d	d	d				
			E436A		d	d	d	d	d	d	d	d	d	d	d	
			E437A		d	d	d	d	d	d	d	d	d	d	d	d

HST/CN	BS	ES/EC	CS	OEE	KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4
a	b	c	d	e												
			E441A		d	d	d	d	d	d	d	d	d	d		
			E443A		d	d	d	d	d	d	d	d	d	d		
			P141A		d	d	d	d	d	d	d	d	d	d	d	d
			P142A		d	d	d	d	d	d	d	d	d	d	d	d
			C401A		d	d	d	d		d				d	d	d
			E444A		d	d	d	d	d	d	d	d	d	d	d	d
			E445A		d	d		d	d	d		d	d	d	d	d
			E446A		d	d	d	d	d	d	d	d	d	d	d	
			E447A		d	d		d	d	d		d	d	d	d	d
			E448A		d	d		d	d	d		d	d	d	d	d
			P43A		d	d	d	d	d	d	d	d	d	d	d	d
					Total 200 credits											

*Depends on elective course chosen

29 Capability / Transferable Skills Map

Course Code					Skills										
HST/CEN	BS	ES/EC	CS	OEE	GK	SL	WC	OC	P	B	IM	PM	L	AO	
a	b	c	d	e											
101A	C101A	C101A	C201A		a	abcd	abcd	abcd	abcd		abcd	abcd			
102A	C102A	C102A	C202A		a	abcd	abcd	abcd	abcd	a	abcd	abcd			
CEN201A	L103A	C103A	C203A		a	abcd	abcd	abcd	abcd		abcd	abcd			
201A	L106A	L104A	C210A		a	abcd	abcd	abcd	abcd	a	abcd	abcd			
	C104A	L105A	L205A			bcd	bcd	bcd	bcd		bcd	bcd			
	C105A	C106A	L206A			bcd	bcd	bcd	bcd		bcd	bcd			
	C207A	C107A	L213A			bcd	bcd	bcd	bcd		bcd	bcd			
	C208A	C108A	C208A			bcd	bcd	bcd	bcd		bcd	bcd			
	C401A	L109A	C209A			bcd	bcd	bcd	bcd		bcd	bcd			
		L110A	C204A			cd	c	cd	cd		c	cd			
		C214A	C211A			d	d	d	d		d	d			
			L207A			d	d	d	d		d	d			
			L214A			d	d	d	d		d	d			
			C301A			d	d	d	d		d	d			
			C304A			d	d	d	d		d	d			
			C302A			d	d	d	d		d	d			
			C303A			d	d	d	d		d	d			
			C305A			d	d	d	d		d	d			
			C311A			d	d	d	d		d	d			
			L306A			d	d	d	d		d	d			
			L307A			d	d	d	d		d	d			
			L313A			d	d	d	d		d	d			
			C306A			d	d	d	d		d	d			
			C310A			d	d	d	d		d	d			
			C308A			d	d	d	d		d	d			
			C314A			d	d	d	d		d	d			
			C313A			d	d	d	d		d	d			
			C315A			d	d	d	d		d	d			
			C309A			d	d	d	d		d	d			
			L312A			d	d	d	d		d	d			
			L316A			d	d	d	d		d	d			
			L317A			d	d	d	d		d	d			
			E412A			d	d	d	d		d	d			
			E413A			d	d	d	d		d	d			
			E414A			d	d	d	d		d	d			
			E415A			d	d	d	d		d	d			
			E416A			d	d	d	d		d	d			
			E417A			d	d	d	d		d	d			
			E422A			d	d	d	d		d	d			

HST/CEN	BS	ES/EC	CS	OEE	GK	SL	WC	OC	P	B	IM	PM	L	AO
a	b	c	d	e										
			E425A			d	d	d	d		d	d		
			E426A			d	d	d	d		d	d		
			E427A			d	d	d	d		d	d		
			E428A			d	d	d	d		d	d		
			E421A			d	d	d	d		d	d		
			E432A			d	d	d	d		d	d		
			E433A			d	d	d	d		d	d		
			E434A			d	d	d	d		d	d		
			E435A			d	d	d	d		d	d		
			E436A			d	d	d	d		d	d		
			E437A			d	d	d	d		d	d		
			E438A			d	d	d	d		d	d		
			E431A			d	d	d	d		d	d		
			P141A		d	d	d	d	d	d	d	d	d	
			P142A		d	d	d	d	d	d	d	d	d	
			C401A			d		d	d		d	d		
			E441A			d	d	d	d		d	d		
			E443A			d	d	d	d		d	d		
			E444A			d	d	d	d		d	d		
			E445A			d		d	d		d	d		
			E446A			d	d	d	d		d	d		
			E447A			d		d	d		d	d		
			E448A			d		d	d		d	d		
			P43A		d	d	d	d	d	d	d	d	d	

GK: Group Work; SL: Self Learning; WC: Written Communication; OC: Oral Communication P: Presentation; B: Behavioural; IM: Information Management; PM: Personal Management L: Leadership; AO: Any other

30	<p>Co-curricular Activities</p> <p>Students are encouraged to take part in co-curricular activities like seminars, conferences, symposia, paper writing, attending industry exhibitions, project competitions and related activities for enhancing their knowledge and networking.</p>
31	<p>Cultural and Literary Activities</p> <p>Annual cultural festivals are held to showcase the creative talents in students. They are involved in planning and organizing the activities.</p>
32	<p>Sports and Athletics</p> <p>Students are encouraged to take part in sports and athletic events regularly. Annual sports meet will be held to demonstrate sportsmanship and competitive spirit.</p>

