



# Programme Specifications

## B. Tech. Programme

Programme:  
Computer science and Engineering

Department:  
Computer science and 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](http://www.msruas.ac.in)

**PROGRAMME SPECIFICATIONS: COMPUTER SCIENCE AND ENGINEERING**

<b>Faculty</b>	Engineering and Technology (FET)
<b>Department</b>	Computer Science and Engineering
<b>Programme</b>	Computer Science and Engineering
<b>Dean of Faculty</b>	Prof. H.M. Rajashekara Swamy
<b>Head of Department</b>	Prof. PVR Murthy

1	<b>Title of the Award</b> B. Tech. in Computer Science and Engineering
2	<b>Modes of Study</b> Full Time
3	<b>Awarding Institution /Body</b> M. S. Ramaiah University of Applied Sciences
4	<b>Joint Award</b> Not Applicable
5	<b>Teaching Institution</b> Faculty of Engineering and Technology, M.S. Ramaiah University of Applied Sciences
6	<b>Date of Programme Specifications</b> July 2019
7	<b>Date of Programme Approval by the Academic Council of MSRUAS</b> June 2018
8	<b>Next Review Date:</b> March 2023
9	<b>Programme Approving Regulating Body and Date of Approval</b> --
14	<p><b>Rationale for the Programme</b></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	<b>Programme Accredited Body and Date of Accreditation</b> --
11	<b>Grade Awarded by the Accreditation Body</b> --
12	<b>Programme Accreditation Validity</b> --
13	<b>Programme Benchmark</b> N/A
15	<b>Programme Mission</b> 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
16	<b>Graduate Attributes</b> <ol style="list-style-type: none"> <li>1. Ability to apply knowledge of mathematics, science, and Engineering fundamentals to solve complex problems in engineering</li> <li>2. Ability to analyse engineering problems, interpret data and arrive at meaningful conclusions involving mathematical inferences</li> <li>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</li> <li>4. Ability to understand and solve complex engineering problems by conducting experimental investigations</li> <li>5. Ability to apply appropriate tools and techniques and understand utilization of resources appropriately to complex engineering activities</li> <li>6. Ability to understand the effect of engineering solutions on legal, cultural, social and public health and safety aspects</li> <li>7. Ability to develop sustainable solutions and understand their effect on society and environment</li> <li>8. Ability to apply ethical principles to engineering practices and professional responsibilities</li> <li>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</li> <li>10. Ability to make effective oral presentations and communicate technical ideas to a broad audience using written and oral means</li> <li>11. Ability to lead and manage multidisciplinary teams by applying engineering and management principles</li> <li>12. Ability to adapt to the changes and advancements in technology and engage in independent and life-long learning</li> </ol>
17	<b>Programme Goal</b> 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.
18	<b>Programme Objectives</b> 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 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.

The objectives of the programme are:

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><b>Programme Intended Learning Outcomes</b></p> <p>The intended learning outcomes are listed under four headings:</p> <ol style="list-style-type: none"> <li>1. Knowledge and Understanding,</li> <li>2. Cognitive skills</li> <li>3. Practical skills and</li> <li>4. Capability / Transferable skills.</li> </ol> <p><b>Knowledge and Understanding</b></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><b>Cognitive Skills</b></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><b>Practical Skills</b></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><b>Capability Skills / Transferrable Skills</b></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	<b>Programme Structure</b>

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19BSC101A	Engineering Mathematics-1	2	2	0	4	100
2	19BSC102A	Engineering Physics	4	0	0	4	100
3	19ESC101A	Elements of Mechanical Engineering and Work shop practise	2	0	2	3	100

## 20. Programme Structure (given in Tables for all semesters):

### SEMESTER 1: Chemistry Cycle

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB101A	Engineering Mathematics-1	2	2	0	4	100
2	20CHB105A	Engineering Chemistry	3	0	0	3	100
3	20CES105A	Elements of Mechanical Engineering and Workshop Practice	2	0	2	3	100
4	20EES106A	Elements of Electrical Engineering	3	0	0	3	100
5	20CSS107A	Elements of Computer Science and Engineering	3	0	0	3	100
6	20CHL106A	Engineering Chemistry Laboratory	0	0	2	1	50
7	20CSL108A	Computer Programming Laboratory	0	0	2	1	50
8	20EEL109A	Basic Electrical Engineering Laboratory	0	0	2	1	50
9	20TSH102A	Professional Communication	2	0	0	2	50
<b>Total</b>			<b>15</b>	<b>2</b>	<b>8</b>	<b>21</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>25 Hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>17</b>	<b>Maximum</b>	<b>21</b>	

### SEMESTER 2: Physics Cycle

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB104A	Engineering Mathematics - 2	2	2	0	4	100
2	20PHB102A	Engineering Physics	3	0	0	3	100
3	20CES101A	Engineering Mechanics	3	0	0	3	100
4	20ECS102A	Elements of Electronics Engineering	3	0	0	3	100
5	20MES103A	Engineering Drawing	1	0	4	3	100
6	20PHL103A	Engineering Physics Laboratory	0	0	2	1	50
7	20ECL104A	Basic Electronics Laboratory	0	0	2	1	50
8	20TSH101A	Constitution, Human Rights and Law	2	0	0	2	50
<b>Total</b>			<b>14</b>	<b>2</b>	<b>8</b>	<b>20</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>24 Hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>16</b>	<b>Maximum</b>	<b>20</b>	



**SEMESTER 3**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB201A	Engineering Mathematics - 3	3	1	0	4	100
2	20CSC202A	Discrete Mathematics	3	1	0	4	100
3	20CSC203A	Data Structures using Python	3	0	0	3	100
4	20CSC204A	Logic Design	3	0	0	3	100
5	20CSC205A	Microprocessors and Architecture	3	0	0	3	100
6	20CSL206A	Python & Data Structures Laboratory	0	0	2	1	50
7	20CSL207A	Logic Design Laboratory	0	0	2	1	50
8	20CSL208A	Microprocessors Laboratory	0	0	2	1	50
9	20CEM209A	Environmental Studies	2	0	0	0	Audit
<b>Total</b>			<b>17</b>	<b>2</b>	<b>6</b>	<b>20</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>25 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>		<b>Maximum</b>	<b>20</b>	

**SEMESTER 4**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB211A	Engineering Mathematics - 4	3	1	0	4	100
2	20CSC212A	Software Development Fundamentals	3	0	0	3	100
3	20CSC213A	Programming Paradigms	3	1	0	4	100
4	20CSC214A	Design and Analysis of Algorithms	3	0	0	3	100
4	20CSC215A	C & Data Structures	3	0	0	3	100
5	20CSC216A	Formal Languages and Automata Theory	3	0	0	3	100
6	20CSL217A	Software Development Laboratory	0	0	2	1	50
7	20CSL218A	Programming Paradigms Laboratory	0	0	2	1	50
<b>Total</b>			<b>18</b>	<b>2</b>	<b>4</b>	<b>22</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>24 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>		<b>Maximum</b>	<b>22</b>	

**SEMESTER 5**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20CSC301A	Probability and Statistics	3	0	0	3	100
2	20CSC302A	Database Systems	3	0	0	3	100
3	20CSC303A	Computer Networks	3	0	0	3	100
4	20CSC304A	Information Security and Protection	3	1	0	4	100
5	20CSC305A	Compilers	3	1	0	4	100
6	20CSC306A	Innovation Course -I	3	0	0	3	100
7	20CSC307A	IoT1	0	1	0	1	50
8	20CSL308A	Database Systems Laboratory	0	0	2	1	50
9	20CSL309A	Computer Networks Laboratory	0	0	2	1	50
10	20CSH310A	Economics and Cost Estimation in Computer Engineering	2	0	0	2	50
<b>Total</b>			<b>20</b>	<b>2</b>	<b>4</b>	<b>25</b>	<b>850</b>
<b>Total number of contact hours per week</b>			<b>26 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>		<b>Maximum</b>	<b>25</b>	

**SEMESTER 6**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20CSC311A	Graph Theory and Optimization	3	0	0	3	100
2	20AIC204A	Principles of Artificial Intelligence	3	0	0	3	100
3	20CSC312A	Innovation Course -II	3	0	0	3	100
4	20CSC313A	Operating Systems	3	0	0	3	100
5	20CSC314A	Web Architecture and Application Development	3	0	0	3	100
6	20CSC315A	Distributed and Cloud Computing	3	1	0	4	100
7	20CSC316A	Design patterns	0	1	0	1	50
8	20AIL207A	Artificial Intelligence Laboratory	0	0	0	1	50
9	20CSL217A	Operating Systems Laboratory	0	0	2	1	50
10	20CSL218A	Web Architecture and Application Development Laboratory	0	0	2	1	50
<b>Total</b>			<b>20</b>	<b>1</b>	<b>4</b>	<b>23</b>	<b>800</b>
<b>Total number of contact hours per week</b>			<b>25 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>		<b>Maximum</b>	<b>23</b>	



**SEMESTER 7**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	Professional Elective	Professional Core Elective - 1	3	1	0	4	100
2	Professional Elective	Professional Core Elective - 2	3	0	0	3	100
3	Professional Elective	Professional Core Elective - 3	3	0	0	3	100
4	Open Elective	Open Elective - 1	3	0	0	3	100
6	I]20CSP401A	I] Project Work - I	0	0	12	4	100
	II]20CSP402A	II] Internship (Choose one)					
7	20CSP403A	Seminar	0	0	2	1	50
<b>Total</b>			<b>12</b>	<b>1</b>	<b>14</b>	<b>18</b>	<b>550</b>
<b>Total number of contact hours per week</b>			<b>27 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>		<b>Maximum</b>	<b>18</b>	

**SEMESTER 8**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
3	Open elective	Open Elective - 2	3	0	0	3	100
4	20CSP411A	Project Work - II	0	0	20	8	100
<b>Total</b>			<b>3</b>	<b>0</b>	<b>20</b>	<b>11</b>	<b>400</b>
<b>Total number of contact hours per week</b>			<b>23 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>0</b>	<b>Maximum</b>	<b>11</b>	

**Professional Core Elective Courses:**

Sl No.	Group	VII Sem		
		PCE-1 Course Name	PCE-2 Course Name	PCE-3 Course Name
1	Software Development	20CSE401A: Software Architecture	20CSE402A: Principles and Practices of Software Testing	I] 20CSE403A: Computer Graphics II] 20CSE404A: IoT 2 (Choose one)
2	Artificial Intelligence	20CSE405A: Computer Vision	20CSE406A: Data Mining	I] 20CSE403A: Computer Graphics II] 20CSE404A: IoT 2 (Choose one)
3	Models of Computation	20CSE407A: Principles and Practices of Cryptography	20CSE408A: Quantum Computing	20CSE409A: Theory of Computation
4	Networks	20CSE410A: Wireless Networks	20CSE411A: Software Defined Networks	20CSE404A: IoT 2

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

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### Assessment and Grading

1. Every course will be assessed for a weight of 100%
2. For the courses having 100% theory

There are two components-Component-1 and Component-2

Component-1 (CE) carries a weight of 50% and Component -2 (SEE) carries a weight of 50%

**Component-1 (CE): 50% weight**

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each theory course is indicated in Table below.

ILO No.	Intended Learning Outcome	CE (Weightage: 50 %)				SEE
		Assessment Type	Comp-1a	Comp-1b	Comp-1c	(Weightage: 50 %)
		Comp Weightage (%)	00	00	00	Sem End Exam
1	ILO-1					
2	ILO-2					
3	ILO-3					
4	ILO-4					
5	ILO-5					
6	ILO-6					

CE – can be from any combination of the following:

Assignments, term Tests, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, others, if any.

**Component - 2 (SEE): 50% weight**

A 3 hour duration Semester End Examination will be conducted for a maximum of 100 marks and will be reduced to 50% weight.

A student is required to score a minimum of 40% marks in Semester end examination and 40% marks overall in each theory course.

### 3. For Laboratory/ Practical courses

Total Marks : 50

Component 1(CE) : Laboratory Report: 50% Weight

Component 2(SEE) Semester End Examination: 50% Weight

A 3 hour duration Semester End Examination will be conducted for a maximum of 50 marks.

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each course is indicated in Table below.

ILO No.	Intended Learning Outcome		CE (Weightage: 50 %)				SEE (Weightage: 50 %):
		Assessment Type	Conduction of Lab Exercises )	(Viva)	(Lab Record Submission)	(Lab Test)	SEE
		Comp Weightage (%)					50
1	ILO-1						
2	ILO-2						

A student is required to score a minimum of 40% marks in Semester end examination and 40% marks overall in each laboratory course.

### 4. For courses with a combination of theory and laboratory

There are two components-Component-1 and Component-2

Component-1 (CE) carries a weight of 50% and Component -2 (SEE) carries a weight of 50%.

**Component-1 (CE): 50% weight**

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each course is indicated in

Table below.

ILO No.	Intended Learning Outcome	CE (Weightage: 50 %)				SEE
		Assessment Type	Comp-1a	Comp-1b	Comp-1c Lab	(Weightage: 50 %)
						SEE
		Comp Weightage (%)	00	00	00	50
1	ILO-1					
2	ILO-2					
3	ILO-3					
4	ILO-4					
5	ILO-5					
6	ILO-6					

CE – can be from any combination of the following:

Assignments, term Tests, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, others,

A 3 hour duration Semester End Examination will be conducted for a maximum of 100 marks and will be reduced to 50 marks.

A student is required to score a minimum of 40% marks in Semester end examination and 40% marks overall in each theory course.

5. Other flexibilities (exceptions) as per the programme regulations.

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**Attendance**

A minimum of 80% attendance is compulsory to appear for semester end examinations. Condoning of attendance shortage is as per the Academic Regulations of B.Tech. Programme.

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**Award of Class**

As per the Academic Regulations of B.Tech. Programme

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**Student support for Learning**

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	<b>Quality Control Measures</b> <ol style="list-style-type: none"><li>1. Review of Course Notes</li><li>2. Review of Question Papers and Assignment Questions</li><li>3. Student Feedback</li><li>4. Moderation of assessed work</li><li>5. Opportunities for students to see their assessed work</li><li>6. Review and Audit by external examiners</li><li>7. Staff Student Consultative Committee meetings</li><li>8. Student exit feedback</li></ol>
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28	Curriculum Map																
Course Code					Intended Learning Outcomes												
					Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving)				Practical skills				
TSH/CEM	BS	ES/EC	CS	OEE	KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4	
a	b	c	d	e													
110A	MHB101A	MES103A	C201A	403		bcd		abcd		d		bd		bcd			
120A	MHB110A	EES104A	C202A		cd	bcd	d	abcd	d	d	d	bd	d	bcd			
210A	MHB201A	EES113A	C203A		d	bcd		abcd	d	d	a	bd	d	bcd			
	MHB211A	MES106A	C210A		d	bcd	d	abcd	d	d	d	bd	d	bcd	d	d	
	PHB102A	ECL109A	L205A		cd	bcd	d	bcd	d	d	d	bd	d	bcd			
	PHL107A	EEL108A	L206A		d	bcd		bcd	d	d		bd	d	bcd			
	CHB111A	CES112A	L213A		cd	bcd	d	bcd	d	d	d	bd	d	bcd	d	d	
	CHL116A	CSS114A	C208A		cd	bcd	d	bcd	cd	cd	cd	bcd	d	bcd			
		CSL115A	C204A		cd	cd		cd	d	d		d	d	d	d	d	
			C209A		d	d	d	d	d	d	d	d	d	d	d	d	
			L214A		d	d		d	d	d		d	d	d			
			L207A		d	d		d	d	d		d	d	d	d	d	
			L212A		d	d		d	d	d		d	d	d	d	d	
			C302A														
			C311A		d	d	d	d	d	d	d	d	d	d	d	d	
			C303A		d	d		d	d	d		d	d	d	d	d	
			C306A		cd	bcd	d	bcd	cd	cd	cd	bcd	d	b			
			L313A		d	d	d	d	d	d	d	d	d	d	d	d	
			L307A		d	d		d	d	d		d	d	d	d	d	
			C301A		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	
			L312A		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			
			E427A		d	d	d	d	d	d	d	d	d	d	d		
			E428A		d	d	d	d	d	d	d	d	d	d			
			E429A		d	d	d	d	d	d	d	d	d	d			
			E431A		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	
			E438A		d	d	d	d	d	d	d	d	d	d	d		
			E439A		d	d	d	d	d	d	d	d	d	d			
			P401A		d	d	d	d	d	d	d	d	d	d	d	d	
			P402A		d	d	d	d	d	d	d	d	d	d	d	d	
			P403A		d	d	d	d		d				d	d	d	
			E441A		d	d	d	d	d	d	d	d	d	d			
			E443A		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												
			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		
			E447A		d	d		d	d	d		d	d	d	d	d
			E448A		d	d		d	d	d		d	d	d	d	d
			E451A		d	d	d	d	d	d	d	d	d	d	d	d
			E452A		d	d		d	d	d		d	d	d	d	d
			E453A		d	d	d	d	d	d	d	d	d	d		
			E454A		d	d		d	d	d		d	d	d	d	d
			E455A		d	d		d	d	d		d	d	d	d	d
			E456A		d	d		d	d	d		d	d	d	d	d
			P404A		d	d	d	d	d	d	d	d	d	d	d	d
					Total 160 credits											

\*Depends on elective course chosen

**29 Capability / Transferable Skills Map**

Course Code					Skills										
HST/CEM	BS	ES/EC	CS	OEE	GK	SL	WC	OC	P	B	IM	PM	L	AO	
a	b	c	d	e											
110A	MHB10	MES103	C201A	403	a	abcd	abcd	abcd	abcd		abcd	abcd			
120A	MHB11	EES104A	C202A		a	abcd	abcd	abcd	abcd	a	abcd	abcd			
210A	MHB20	EES113A	C203A		a	abcd	abcd	abcd	abcd		abcd	abcd			
	MHB21	MES106	C210A		a	abcd	abcd	abcd	abcd	a	abcd	abcd			
	PHB102	ECL109A	L205A			bcd	bcd	bcd	bcd		bcd	bcd			
	PHL107	EEL108A	L206A			bcd	bcd	bcd	bcd		bcd	bcd			
	CHB111	CES112A	L213A			bcd	bcd	bcd	bcd		bcd	bcd			
	CHL116A	CSS114A	C208A			bcd	bcd	bcd	bcd		bcd	bcd			
		CSL115A	C204A			cd	c	cd	cd		c	cd			
			C209A			d	d	d	d		d	d			
			C211A			d	d	d	d		d	d			
			L214A			d	d	d	d		d	d			
			L207A			d	d	d	d		d	d			
			L212A			d	d	d	d		d	d			
			C302A			d	d	d	d		d	d			
			C311A			d	d	d	d		d	d			
			C303A			d	d	d	d		d	d			
			C306A			d	d	d	d		d	d			
			L313A			d	d	d	d		d	d			
			L307A			d	d	d	d		d	d			
			C301A			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			
			L312A			d	d	d	d		d	d			
			L317A			d	d	d	d		d	d			
			L316A			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			
			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			

HST/CEN a	BS b	ES/EC c	CS d	OEE e	GK	SL	WC	OC	P	B	IM	PM	L	AO
			E429A			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		
			E439A			d	d	d	d		d	d		
			E431A			d	d	d	d		d	d		
			P401A		d	d	d	d	d	d	d	d	d	
			P402A		d	d	d	d	d	d	d	d	d	
			P403A		d	d	d	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		
			E451A			d		d	d		d	d		
			E452A			d		d	d		d	d		
			E453A			d		d	d		d	d		
			E454A			d		d	d		d	d		
			E455A			d		d	d		d	d		
			E456A			d		d	d		d	d		
			P404A		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	<b>Co-curricular Activities</b>  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.
31	<b>Cultural and Literary Activities</b>  Annual cultural festivals are held to showcase the creative talents in students. They are involved in planning and organizing the activities.
32	<b>Sports and Athletics</b>  Students are encouraged to take part in sports and athletic events regularly. Annual sports meet will be held to demonstrate sportsmanship and competitive spirit.

