Kolhapur Institute of Technology's
College of Engineering
(Autonomous), Kolhapur

KOLHAPUR INSTITUTE OF TECHNOLOGY'S
COLLEGE OF ENGINEERING
KOLHAPUR
(EMPOWERED AUTONOMOUS)

Department of Computer Science & Engineering

Curriculum and Syllabus for
T.Y.B. Tech. Computer Science & Engineering
Scheme 2024-25 (As Per NEP, 2020)

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About the Department

The department was established in the year 1999 with an initial intake of 60. However, in 2018, due to demand from the industry and engineering aspirants the intake was increased to 180. The department has been accredited by the National Board of Accreditation (NBA) in 2008, 2018 and recently in 2023. The institution is accredited with A+ grade by National Assessment and Accreditation Council (NAAC) with CGPA 3.33 in 2023.

We have a highly committed and competitive team of faculty fraternity, who experiments and adapts new innovative pedagogy methods for making all the technical concepts clear as well to keep our students abreast with the latest technologies, skills and developments emerging in this field. We have one Doctorate Faculty member and 8 Faculty members are pursuing Ph.D. from various universities. This practice has proved our students very challenging and successful in various domains of competitions at university, state and national level.

Department Vision

To be preferred choice of stakeholders by building core theoretical and practical skills in the students and abreast them to be globally competent with the latest technologies, skills and developments emerging in the field of Computer Science and Engineering.

Department Mission

M1:	To empower students with essential technical comprehension and skills.
M2:	To create awareness of societal and ethical needs in the field of Computer Science and Engineering.
M3:	To build competency among the students with modern tools & technologies and collaborative research.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)	
PEO1	Graduates will possess the fundamental knowledge of computer science and engineering needed to address challenges in the real world.
PEO2	Graduates will excel at using their theoretical knowledge in practice, which will enable them to reach professional success and corporate standards.
PEO3	Graduates will acquire humanity skills, professionalism, ethics, entrepreneurial skills and multidisciplinary approach for wider societal and environmental context.
PEO4	Graduates will get a platform for research and development that will assist them in recognizing and addressing the challenges of the IT sector.

PROGRAMME OUTCOMES (PO)	
PO1:	Engineering knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals, in depth technical competence in computer science and engineering discipline and an engineering specialization to develop the solution of complex engineering problems.
PO2:	Problem analysis: Identify, formulate, review various computer science research literatures and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.
PO3:	Design/Development of solutions: Design creative solutions for complex computer science and engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.
PO4:	Conduct investigations of complex problems: Conduct investigations of complex computer science and engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.
PO5:	Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex computer science and engineering problems.
PO6:	The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex computer science and engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment.
PO7:	Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.
PO8:	Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO9:	Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
PO10:	Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11:	Life-Long Learning: Recognize the need for and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change in computer science and engineering discipline.

PROGRAMME SPECIFIC OUTCOMES (PSO)	
PSO1:	Learn and adapt the latest software technologies in the field of computer science and engineering.
PSO2:	Identify and analyze real life problems and provide innovative software solutions.

s per NEP Guidelines Proposed Scheme
of Credit Distribution

Year		FY		SY		TY		B. Tech.			
Sr No		I	II	III	IV	V	VI	VII	VIII	Actual	NEP Guidelines
1	Basic Science course	8	8							16	14-18
2	Engineering Science course	7	6							13	12-16
3	Programme Core Courses	3		15	16	10	10	11		61	44-56
4	Programme Elective course					3	4	3	6	16	20
5	Multi Minor			2	3	3	3	3		14	14
6	Open elective					3	3	2		8	8
7	Vocational and Skill Enhancement course	1	3		1		1			6	8
8	Ability enhancement course		3			1				4	4
9	Entrepreneurship /Economics/ Management courses (Mgt/Economics/Mkt/Finance)			2		2				4	4
10	Indian knowledge system	2								2	2
11	Value Education course			2	2					4	4
12	Research Methodology (Project)							4		4	4
13	Comm. Engg Project/Field Project (PBL/Seminar/Mini Project)					1	1			2	2
14	Project								4	4	4
15	Internship/OJT (PBL/Seminar/Mini Project/Virtual Internship/Physical)			1	1				6	8	12
16	Co curricular courses		1		1		1		1	4	4
		20-22	20-22	20-22	20-22	20-22	20-22	20-22	20-22	174	
		21	21	22	24	23	23	23	17	174	

SEMESTER III												
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs /Week**	**Credits**	**Evaluation Scheme (Components)**				**Category**
1	UCSPC0301	Discrete Mathematical Structures	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
2	UCSPC0302	Advanced Data Structures and Algorithms	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
3	UCSPC0303	Design Thinking	2	-	-	2	2	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
4	UCSPC0304	Computer Networks	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
5	UCSEM0305	Software Project Management	2	-	-	2	2	ESE	50	20		HSSM
6	UCSVE0306	Constitution of India	2	-	-	2	2	ISE	50	20		VEC
7	UCSPC0331	Advanced Data Structures and Algorithms Laboratory	-	-	2	2	1	ISE	25	10		PC
								ESE (POE)	25	10		
8	UCSPC0332	Computer Networks Laboratory	-	-	2	2	1	ISE	25	10		PC
9	UCSPC0333	Object Oriented Programming Laboratory	-	-	4	4	2	ISE	25	10		PC
								ESE (POE)	50	20		
10	UCSIL0371	Mini Project- I	-	-	2	2	1	ISE	50	20		OJT
11	UCSMM034*	Multi-Disciplinary Minor (MDM-I)	2	-	-	2	2	ESE	100	40		MM

		Total:	**27**	**22**	**Total Marks: 800** **Total Credit: 22**	

Semester IV												
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs.**	**Credits**	**Evaluation Scheme**				**Category**
								Component				
1	UCSPC0401	Computational Mathematics	3	-	-	3	3	ISE1 MSE ISE2 ESE	10 30 10 50	 20	40	PC
2	UCSPC0402	Web Technologies	3	-	-	3	3	ISE1 MSE ISE2 ESE	10 30 10 50	 20	40	PC
3	UCSPC0403	Automata Theory	3	-	-	3	3	ISE1 MSE ISE2 ESE	10 30 10 50	 20	40	PC
4	UCSPC0404	Introduction to Artificial Intelligence	2	-	-	2	2	ISE1 MSE ISE2 ESE	10 30 10 50	 20	40	PC
5	UCSPC0405	Operating Systems	3	-	-	3	3	ISE1 MSE ISE2 ESE	10 30 10 50	 20	40	PC
6	UCSVE0406	Environmental Studies	2	-	-	2	2	ISE	50	20		VEC
7	UCSPC0431	Web Technologies Laboratory	-	-	2	2	1	ISE ESE (POE)	25 25	10 10		PC
8	UCSPC0432	Operating Systems Laboratory	-	-	2	2	1	ISE	25	10		PC
9	UCSIL0471	Mini-Project -II	-	-	2	2	1	ISE	25	10		OJT
10	UCSVS0433	Advanced Programming Laboratory	-	-	2	2	1	ISE ESE (POE)	25 25	10 10		VSEC
11	UCSCC0434	Co-Curricular Activities-II	-	-	2	2	1	ESE	50	20		CC

12	UCSMM044 *	Multi-Disciplinary Minor	3	-	-	3	3	ESE	100	40	MM
					Total:	**29**	**24**	**Total Marks: 850 Total Credit: 24**			

SEMESTER V												
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs /Week**	**Credits**	**Evaluation Scheme (Component)**				**Category**
1	UCSPC0501	Database Management Systems	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
2	UCSPC0502	Compiler Design	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
3	UCSPC0503	Machine Learning	2	-	-	2	2	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
4	UCSPE051*	Program Elective-I (PE-I)	3	-	-	3	3	ISE1	10		40	PEC
								MSE	30			
								ISE2	10			
								ESE	50	20		
5	UCSOE052*	Open Elective-I (OE-I)	3	-	-	3	3	ISE1	10		40	OE
								MSE	30			
								ISE2	10			
								ESE	50	20		
6	UCSEM0504	Agile Project Management	2	-	-	2	2	ESE	50	20		HSSM
7	UCSPC0531	Database Management Systems Laboratory	-	-	2	2	1	ISE	25	10		PC
								ESE (POE)	25	10		
8	UCSPC0532	Machine Learning Laboratory	-	-	2	2	1	ISE	25	10		PC
								ESE (POE)	25	10		
9	UCSAE0533	Business Communication and Value Science	-	-	2	2	1	ISE	25	10		AEC

10	UCSIL0571	Mini Project-III	-	-	2	2	1	ISE	25	10	CEP
11	UCSMM054*	Multi-Disciplinary Minor (MDM-III)	3	-	-	3	3	ESE	100	40	MM
		Total:				**28**	**23**	**Total Marks: 800 Total Credit: 23**			

PROGRAM ELECTIVE I								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	V	UCSPE0511	IoT System Design	3	-	-	3	3
2	V	UCSPE0512	Computer Graphics	3	-	-	3	3
3	V	UCSPE0513	Linux Internals	3	-	-	3	3
4	V	UCSPE0514	Human Computer Interface (UI and UX)	3	-	-	3	3
						Total:	3	3

SEMESTER VI												
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs/ Week**	**Credits**	**Evaluation Scheme (Component)**				**Category**
1	UCSPC0601	Advanced Database Management Systems	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
2	UCSPC0602	Information Security	3	-	-	3	3	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
3	UCSPC0603	Mobile Application Development	2	-	-	2	2	ISE1	10		40	PC
								MSE	30			
								ISE2	10			
								ESE	50	20		
4	UCSPE061*	Program Elective-II (PE-II)	3	-	-	3	3	ISE1	10		40	PEC
								MSE	30			
								ISE2	10			
								ESE	50	20		
5	UCSOE062*	Open Elective-II (OE-II)	3	-	-	3	3	ISE1	10		40	OE
								MSE	30			
								ISE2	10			
								ESE	50	20		
6	UCSVS0631	Data Visualization Laboratory	-	-	2	2	1	ISE	25	10	10	VSEC
7	UCSPC0632	Advanced Database Systems Laboratory	-	-	2	2	1	ISE	25	10		PC
								ESE (POE)	50	25		
8	UCSPC0633	Information Security Laboratory	-	-	2	2	1	ISE	25	10		PC
								ESE (POE)	25	10		
9	UCSPC0634	Mobile Application Development Laboratory	-	-	2	2	1	ISE	25	10		PC
10	UCSIL0671	Mini Project IV	-	-	2	2	1	ISE	25	10		FP
11	UCSCC0635	Co-Curricular Activities-III	-	-	2	2	1	ISE	50	20		CC

12	UCSMM064*	Multi-Disciplinary Minor (MDM-IV)	3	-	-	3	3	ESE	100	40	MM
		Total:				**29**	**23**	**Total Marks: 850 Total credits: 23**			

PROGRAM ELECTIVE II								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	VI	UCSPE0611	Embedded Systems & RTOS	3	-	-	3	3
2	VI	UCSPE0612	Business Intelligence	3	-	-	3	3
3	VI	UCSPE0613	Augmented Reality (AR) and Virtual Reality (VR)	3	-	-	3	3
4	VI	UCSPE0614	Ethical Hacking	3	-	-	3	3
			Total:				3	3

SEMESTER VII													
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs / Week**	**Credits**	**Evaluation Scheme (Component)**					**Category**
1	UCSPC0701	Big Data Analytics	3	-	-	3	3	ISE1	10		40		PC
								MSE	30				
								ISE2	10				
								ESE	50	20			
2	UCSPC0702	Cloud Computing	3	-	-	3	3	ISE1	10		40		PC
								MSE	30				
								ISE2	10				
								ESE	50	20			
3	UCSPC0703	Software Testing & Quality Assurance	2	-	-	2	2	ISE1	10		40		PC
								MSE	30				
								ISE2	10				
								ESE	50	20			
4	UCSPE071*	Program Elective-III (PE-III)	3	-	-	3	3	ISE1	10		40		PEC
								MSE	30				
								ISE2	10				
								ESE	50	20			
5	UCSOE072*	Open Elective-III (OE-III)	2	-	-	2	2	ISE1	10		40		OE
								MSE	30				
								ISE2	10				
								ESE	50	20			
7	UCSPC0731	Cloud Computing Laboratory	-	-	2	2	1	ISE	25		10		PC
								ESE (POE)	25		10		
8	UCSPC0732	Devops Laboratory	-	-	4	4	2	ISE	25		10		PC
								ESE(OE)	25		10		
9	UCSIL0771	Major Project-I	-	-	8	8	4	ISE I	50		20		RM
								ESE (OE)	50		20		
10	UCSMM074 *	Multi-Disciplinary Minor (MDM-V)	3	-	-	3	3	ESE	100		40		MM
					Total:	**30**	**23**	**Total Marks: 800 Total Credit: 23**					

PROGRAM ELECTIVE III								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	VII	UCSPE0711	Deep Learning	3	-	-	3	3
2	VII	UCSPE0712	IoT Security and Privacy	3	-	-	3	3
3	VII	UCSPE0713	Natural Language Processing	3	-	-	3	3
4	VII	UCSPE0714	Digital Image Processing	3	-	-	3	3
						Total:	3	3

SEMESTER VIII

Sr. No.	Course Code	Course Name	L	T	P	Hrs/ Week	Credits	Evaluation Scheme (Component)				Category
1	UCSPE081*	Program Elective - IV (PE-IV)	3	-	-	3	3	ISE1	10		40	PEC
								MSE	30			
								ISE2	10			
								ESE	50	20		
2	UCSPE081*	Program Elective - V (PE-V)	3	-	-	3	3	ISE1	10		40	PEC
								MSE	30			
								ISE2	10			
								ESE	50	20		
3	UCSIL0871	Major Project-II	-	-	8	8	4	ISE I	50	20		RP
								ESE (OE)	50	20		
4	UCSIL0872	Internship	-	-	12	12	6	ISE1	75	30	60	OJT
								ISE2	75	30		
5	UCSCC0831	Co- Curricular Activities-IV	-	-	2	2	1	ISE	50	20	20	CC
					Total:	**28**	**17**	**Total Marks: 500 Total Credit: 17**				

PROGRAM ELECTIVE IV

Sr. No.	Semester	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	VIII	UCSPE0811	Computer Vision	3	-	-	3	3
2	VIII	UCSPE0812	Cyber Security & Forensics	3	-	-	3	3
3	VIII	UCSPE0813	Robotic Process Automation	3	-	-	3	3
4	VIII	UCSPE0813	Edge Computing	3	-	-	3	3
			Total:				3	3

PROGRAM ELECTIVE V								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	VIII	UCSPE0814	Introduction to Blockchain	3	-	-	3	3
2	VIII	UCSPE0815	High Performance Computing	3	-	-	3	3
3	VIII	UCSPE0816	Microservices Architecture	3	-	-	3	3
4	VIII	UCSPE0816	Quantum Computing	3	-	-	3	3
						Total:	3	3

PROGRAM CORE								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	III	UCSPC0301	Discrete Mathematical Structures	3	-	-	3	3
2	III		Advanced Data Structures and Algorithms	3	-	-	3	3
3	III	UCSPC0303	Design Thinking	2	-	-	2	2
4	III	UCSPC0304	Computer Networks	3	-	-	3	3
5	III	UCSPC0331	Advanced Data Structures and Algorithm lab	-	-	2	2	1
6	III	UCSPC0332	Computer Networks Lab	-	-	2	2	1
7	III	UCSPC0333	Object Oriented Programming Lab	-	-	4	4	2
8	IV	UCSPC0401	Computational Mathematics	3	-	-	3	3
9	IV	UCSPC0402	Web Technologies	3	-	-	3	3
10	IV	UCSPC0403	Automata Theory	3	-	-	3	3
11	IV	UCSPC0404	Introduction to Artificial Intelligence	2	-	-	2	2
12	IV	UCSPC0404	Operating Systems	3	-	-	3	3
13	IV	UCSPC0431	Web Technologies Laboratory	-	-	2	2	1
14	IV	UCSPC0432	Operating Systems Laboratory	-	-	2	2	1
15	V	UCSPC0501	Database Management Systems	3	-	-	3	3
16	V	UCSPC0502	Compiler Design	3			3	3
17	V	UCSPC0503	Machine Learning	2	-	-	2	2
18	V	UCSPC0531	Database Management Systems	-	-	2	2	1
19	V	UCSPC0532	Machine Learning Laboratory	-	-	2	2	1
20	VI	UCSPC0601	Advanced Database Systems	3	-	-	3	3
21	VI	UCSPC0602	Information Security	3	-	-	3	3
22	VI	UCSPC0603	Mobile Application Development	2	-	-	2	2
23	VI	UCSPC0631	Advanced Database Systems Laboratory	-	-	2	2	1
24	VI	UCSPC0632	Information Security Laboratory	-	-	2	2	1
25	VI	UCSPC0633	Mobile Application Development Laboratory	-	-	2	2	1
26	VII	UCSPC0701	Big Data Analytics	3	-	-	3	3
27	VII	UCSPC0702	Cloud Computing	3	-	-	3	3

28	VII	UCSPC0703	Software Testing & Quality Assurance	2	-	-	2	2
29	VII	UCSPC0731	Cloud Computing laboratory	-	-	2	2	1
30	VII	UCSPC0732	Devops Laboratory			4	4	1
				Total :			73	61

VOCATIONAL AND SKILL ENHANCEMENT COURSE

Sr. No.	Semester	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	IV	UCSVS0433	Advanced Programming Laboratory	-	-	2	2	1
2	VI	UCSVS0631	Data Visualization Laboratory	-	-	2	2	1
						Total:	4	2

ABILITY ENHANCEMENT COURSE

Sr. No.	Semester	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	V	UCSAE0533	Business Communication and Value Science	-	-	2	2	1
						Total:	2	1

VALUE EDUCATION COURSE

Sr. No.	Semester	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	III	UCSVE0306	Constitution of India	2	-	-	2	2
2	IV	UCSVE0406	Environmental studies	2	-	-	2	2
						Total:	4	4

RESEARCH METHODOLOGY (PROJECT)

Sr. No.	Semester	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	VII	UCSIL0771	Major Project-I	-	-	8	8	4
2	VIII	UCSIL0871	Major Project-II	-	-	8	8	4
						Total:	16	8

ENTREPRENEURSHIP /ECONOMICS/ MANAGEMENT COURSES								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	III	UCSEM0305	Software Project management	2	-	-	2	2
2	V	UCSEM0504	Agile Project management	2	-	-	2	2
						Total:	4	4

Community Engineering Project/Field Project (PBL/Seminar/Mini Project)								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	III	UCSIL0371	Mini Project-I	-	-	2	2	1
2	VI	UCSIL0471	Mini-Project-II	-	-	2	2	1
3	V	UCSIL0571	Mini-Project-III	-	-	2	2	1
4	VI	UCSIL0671	Mini-Project-IV	-	-	2	2	1
						Total:	8	4

Internship/On Job Training								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	VIII	UCSIL0872	Internship	-	-	12	12	6
						Total:	12	6

Co-curricular Courses								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	IV	UCSCC0434	Co-Curricular Activities-II	-	-	2	2	1
2	VI	UCSCC0635	Co-Curricular Activities-III	-	-	2	2	1
3	VIII	UCSCC0831	Co-Curricular Activities-IV	-	-	2	2	1
						Total:	6	3

OPEN ELECTIVE COURSES								
Sr. No.	**Semester**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
2	V	UCSOE0521	Customer Relationship Management (OE-I)	3	-	-	3	3
3	VI	UCSOE0621	Engineering Econometrics (OE-II)	3	-	-	3	3
						Total:	6	6

Exit Courses after Semester – IV (For awarding a UG Diploma)

Course Code	Course Name	Teaching Scheme	Evaluation Scheme		
			Component	Marks	
		Credits		Max. Marks	Min. for Passing
UCSEX0491	Certification Course in Web Development / App Development	3	ISE	50	20
UCSEX0492	Certified Database Engineer	3	ISE	50	20
UCSEX0493	Training (Vocational)	2	ISE (OE)	50	20
	Total	**8**	**Total Marks: 150** **Total Credit: 8**		

Exit Courses after Semester – VI (For awarding a Bachelor Degree)

Course Code	Course Name	Teaching Scheme	Evaluation Scheme		
			Component	Marks	
		Credits		Max. Marks	Min. for Passing
UCSEX0691	Certification Course in Cloud Computing	3	ISE	50	20
UCSEX0692	Certification Course in Networking	3	ISE	50	20
UCSEX0693	Training (Vocational)	2	ISE (OE)	50	20
	Total	**8**	**Total Marks: 150** **Total Credit: 8**		

Multi-Disciplinary Minor (MDM) Courses offered to the CSE Students

Business Analytics

S. No	Course Code	Name of the course	Credits	Semester
1.	UCSMM0341	Business Statistics	2-0-0	III
2.	UCSMM0441	Optimization Methods for Analytics	3-0-0	IV
3.	UCSMM0541	Multivariate Data Analysis	3-0-0	V
4.	UCSMM0641	Social Media Analytics	3-0-0	VI
5.	UCSMM0741	Financial Analytics	3-0-0	VII

Internet of Things

S. No	Course Code	Name of the course	Credits	Semester
1.	UCSMM0342	Introduction to Internet of Things	2-0-0	III
2.	UCSMM0442	Introduction to Security of Cyber Physical Systems	3-0-0	IV
3.	UCSMM0542	Ubiquitous Sensing, Computing and Communication	3-0-0	V
4.	UCSMM0642	Embedded Systems for IoT	3-0-0	VI
5.	UCSMM0742	IoT with Arduino, ESP, and Raspberry Pi	3-0-0	VII

Smart Healthcare

S. No	Course Code	Name of the course	Credits	Semester
1.	UCSMM0343	AI in Healthcare	2-0-0	III
2.	UCSMM0443	Bioimaging	3-0-0	IV
3.	UCSMM0543	Bio-Statistics and Data Analysis	3-0-0	V
4.	UCSMM0643	AR VR applications for healthcare	3-0-0	VI
5.	UCSMM0743	Algorithms in Computational Biology	3-0-0	VII

Emerging Minor in Data Science

Emerging Minor in Data Science										
Course Code	**Course Name**	**L**	**T**	**P**	**Hrs /Week**	**Credits**	**Evaluation Scheme (Components)**			**Semester**
UCSMN0361	Mathematics for Data Science	3	1		4	4	ESE	100	40	III
UCSMN0461	Introduction to Data Science	3	1		4	4	ESE	100	40	IV
UCSMN0561	Computational Data analytics	3	1		4	4	ESE	100	40	V
UCSMN0661	Web Data Mining	3	1		4	4	ESE	100	40	VI
UCSMN0761	Python for Data Science	2			2	2	ESE	100	40	VII
		16	4		18	18	**Total Marks: 500** **Total Credit: 18**			

B. Tech (Hons.) Computer Science & Engineering with Specialization of Artificial intelligence & Data Science

B. Tech (Hons.) Computer Science & Engineering with Specialization of Artificial intelligence & Data Science										
Course Code	**Course Name**	**L**	**T**	**P**	**Hrs /Week**	**Credits**	**Evaluation Scheme (Components)**			**Semester**
UCSHN0351	Mathematical Foundations for AI and ML	3	1		4	4	ESE	100	40	III
UCSHN0452	Data Engineering	3	1		4	4	ESE	100	40	IV
UCSHN0553	Artificial Intelligence and Machine Learning Programming	4		2	6	5	ESE	100	40	V
UCSHN0654	Deep Learning	3	1		4	4	ESE	100	40	VI
UCSHN0755	Mini Project			2		1	ESE	100	40	VII
		13	3	4	18	18	**Total Marks: 500** **Total Credit: 18**			