KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506 015, TELANGANA, INDIA

काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६०१५, तेलंगाना, भारत

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ – ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము

(An Autonomous Institute under Kakatiya University, Warangal)
(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)

Estd: 1980
K I T S W

website: www.kitsw.ac.in   E-mail: principal@kitsw.ac.in   ☎ : +91 9392055211, +91 7382564888

• B.Tech. •
COMPUTER SCIENCE AND ENGINEERING
(Artificial Intelligence & Machine Learning) CSM

Rules & Regulations for undergraduate Programme
B.Tech. 4-Year Degree Programme (URR-18R22)
(Applicable from the Academic Year 2022-23)

SYLLABI (I to VIII SEMESTERS)

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KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506 015, TELANGANA, INDIA

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VISION OF THE INSTITUTE

- *To make our students technologically superior and ethically strong by providing quality education with the help of our dedicated faculty and staff and thus improve the quality of human life*

MISSION OF THE INSTITUTE

- *To provide latest technical knowledge, analytical and practical skills, managerial competence and interactive abilities to students, so that their employability is enhanced*

- *To provide a strong human resource base for catering to the changing needs of the Industry and Commerce*

- *To inculcate a sense of brotherhood and national integrity*

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERIG (AI&ML)
VISION OF THE DEPARTMENT

- *? Attaining centre of excellence status in various fields of Computer Science and Engineering by offering worthful education, training and research to improve quality of software services for ever growing needs of the industry and society.*

MISSION OF THE DEPARTMENT

- *Practice qualitative approach and standards to provide students better understanding and profound knowledge in the fundamentals and concepts of computer science with its allied disciplines*

- *Motivate students in continuous learning to enhance their technical, communicational, and managerial skills to make them competent and cope with the latest trends, technologies, and improvements in computer science to have a successful career with professional ethics.*

- *Involve students in analyze, design and experimenting with contemporary research problems in computer science to impact socio-economic, political and environmental aspects of the globe.*

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

UG - COMPUTER SCIENCE &ENGINEERING (NETWORKS) -AI & ML

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)	*Within first few years after graduation, the COMPUTER SCIENCE AND ENGINEERING (NETWORKS) graduates will be able to …*
PEO1: *Technical Expertise*	*Apply the fundamental knowledge of the core courses of computer science, Artificial Intelligence and Machine Learning for developing the effective and transformational software solutions.*
PEO2: *Successful Career*	*Excel in profession, higher education and entrepreneurship with updated technologies in software, artificial intelligence and data science based domains.*
PEO3: *Soft Skills and Life Long Learning*	*Exhibit professional ethics, effective communication and team work in solving contemporary knowledge engineering problems and to excel in social innovations.*

PROGRAM OUTCOMES (POs) & PROGRAM SPECIFIC OUTCOMES (PSOs)

UG - COMPUTER SCIENCE & ENGINEERING (NETWORKS)- AI & ML

PROGRAM OUTCOMES (POs)	*At the time of graduation, the COMPUTER SCIENCE AND ENGINEERING (NETWORKS) graduates will be able to …*
PO1: *Engineering knowledge*	*apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems*
PO2: *Problem analysis*	*identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences*
PO3: *Design development of solutions*	*design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental Considerations*
PO4: *Conduct investigations of complex problems*	*use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions*
PO5: *Modern tool usage*	*create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations*

PO6: **The engineer and society**	apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO7: **Environment** **and sustainability**	understand the impact of the professional engineering solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development
PO8: **Ethics**	apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice
PO9: **Individual and team work**	function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
PO10: **Communication**	communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO11 **Project management** **and finance**	demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO12: **Life-long learning**	recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAM SPECIFIC OUTCOMES (PSOs):	
PSO1: Software Development and Quality assurance	Apply the fundamentals of computer science and engineering knowledge in developing the effective computing solutions for real world complex engineering problems.
PSO2: Maintenance	Design and configure solutions for various artificial intelligence systems and cognitive applications using contemporary hardware and software tools.
PSO3: Immediate professional practice	Develop effective machine learning applications to improve efficiency of existing data processing applications by continuous adaptation of flourishing updates.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL – 15
(An Autonomous Institute under Kakatiya University, Warangal)
SCHEME OF INSTRUCTION & EVALUATION
I-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

URR-18R22

[5Th+2P+3MC]

Sl. No	Category	Course Code	Course Title	Periods/week L	Periods/week T	Periods/week P	Credits C	CIE TA	CIE MSE	CIE Total	ESE	Total Marks
1	BSC	U18MH101	Engineering Mathematics – I	3	1	-	4	10	30	40	60	100
2	ESC	U18CS102	Programming for Problem Solving using C	3	-	-	3	10	30	40	60	100
3	BSC	U18CH103	Engineering Chemistry	3	1	-	4	10	30	40	60	100
4	ESC	U18ME104	Engineering Drawing	2	-	4	4	10	30	40	60	100
5	ESC	U18CE105	Engineering Mechanics	3	1	-	4	10	30	40	60	100
6	ESC	U18CS107	Programming for Problem Solving using C Laboratory	-	-	2	1	40	-	40	60	100
7	BSC	U18CH108	Engineering Chemistry Laboratory	-	-	2	1	40	-	40	60	100
8	MC	U18CH109	Environmental Studies	2	-	-	-	10	30	40	60	100
9	MC	U18EA110	EAA *: Sports/Yoga/NSS	-	-	2	-	100	-	100	-	100
10	MC	U18EA111	Universal Human Value-I (*Induction Programme*)	-	-	-	-	-	-	-	-	-
			Total:	16	3	10	21	240	180	420	480	900

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]   EAA: Extra Academic Activity   * indicates mandatory non-credit course

Total Contact Periods/Week: 29   **Total Credits: 21**

Stream-I: ME, CSE, IT, CSN, CSE(IOT)   **Stream-II:** CE, EIE, EEE, ECE, ECI, CSE(AI&ML)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL – 15
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SCHEME OF INSTRUCTION & EVALUATION
II-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

URR-18R22

[5Th+4P+1MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
								CIE			ESE	Total Marks
				L	T	P	C	TA	MSE	Total		
1	BSC	U18MH201	Engineering Mathematics – II	3	1	-	4	10	30	40	60	100
2	ESC	U18CS202R1	Data Structures through C	3	-	-	3	10	30	40	60	100
3	BSC	U18PH203	Engineering Physics	3	1	-	4	10	30	40	60	100
4	HSMC	U18MH204	English for Communication	2	-	2	3	10	30	40	60	100
5	ESC	U18EE205	Basic Electrical Engineering	3	1	–	4	10	30	40	60	100
6	ESC	U18EE206	Basic Electrical Engineering Laboratory	-	-	2	1	40	-	40	60	100
7	ESC	U18CS207R1	Data Structures through C Laboratory	-	-	2	1	40	-	40	60	100
8	BSC	U18PH208	Engineering Physics Laboratory	–	–	2	1	40	-	40	60	100
9	ESC	U18ME209	Workshop Practice	-	–	2	1	40	-	40	60	100
10	MC	U18EA210	EAA: Sports/Yoga/NSS*	-	-	2	-	100	-	100	-	100
Total:				14	3	12	22	310	150	460	540	1000

[L= Lecture, T = Tutorials, P = Practicals & C = Credits] EAA: Extra Academic Activity   * indicates mandatory non-credit course

Total Contact Periods/Week: 29
Total Credits: 22
Stream-I: ME, CSE, IT, CSN,CSE(IOT)
Stream-II: CE, EIE, EEE, ECE, ECI,CSE(AI&ML)

Internships: All students should plan for mandatory 6-8 weeks internship, from end of II semester to commencement of VII semester at industry/R&D organizations/industries of national importance (IITs/IIITs/NITs). As part of Internship Evaluation in VII Semester, students are expected to submit a well-documented internship report and give an informative ppt presentation in VII semester.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL – 15
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SCHEME OF INSTRUCTION & EVALUATION
III-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[7Th+2P]

S.No	Category	Course Code	Course Title	Periods/week L	T	P	Credits C	CIE TA	MSE	Total	ESE	Total Marks
1	BSC	U18MH301	Engineering Mathematics – III	3	1	-	4	10	30	40	60	100
2	HSMC	U18MH302	Soft and Inter personal Skills	–	–	2	1	100	-	100	-	100
3	PCC	U18AI303	Object Oriented Programming through JAVA	3	1	-	4	10	30	40	60	100
4	PCC	U18AI304	Operating Systems	3	-	-	3	10	30	40	60	100
5	PCC	U18AI305	Computer Organization and Architecture	3	-	-	3	10	30	40	60	100
6	PCC	U18AI306R22	Advanced Data Structures	3	-	-	3	10	30	40	60	100
7	PCC	U18AI307	Formal Languages and Automata Theory	3	-	-	3	10	30	40	60	100
8	PCC	U18AI310	Object Oriented Programming through Java Laboratory	-	-	2	1	40	-	40	60	100
9	PCC	U18AI311R22	Advanced Data Structures Laboratory	–	–	2	1	40	-	40	60	100
			Total:	18	2	6	23	240	180	420	480	900

[L= Lecture, T = Tutorials, P = Practicals & C = Credits] Total Contact Periods/Week : 26Total Credits: 23

Stream-I: ME, CSE, IT, CSN,CSE(IOT)   Stream-II: CE, EIE, EEE, ECE, ECI,CSE(AI&ML)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE: WARANGAL – 15
(An Autonomous Institute under Kakatiya University, Warangal)

SCHEME OF INSTRUCTION & EVALUATION
IV-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

URR-18R22

[6Th+3P+2MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
								CIE			ESE	Total Marks
				L	T	P	C	TA	MSE	Total		
1	OE	U18OE401	Open Elective-II	3	1	-	4	10	30	40	60	100
2	HSMC	U18TP402	Professional English	-	-	2	1	100	-	100	-	100
3	OE	U18OE403	Open Elective-I	3	-	-	3	10	30	40	60	100
4	PCC	U18AI404	Artificial Intelligence	3	-	-	3	10	30	40	60	100
5	PCC	U18AI405	Database Management Systems	3	1	-	4	10	30	40	60	100
6	PCC	U18AI406	Python Programming	3	-	-	3	10	30	40	60	100
7	PCC	U18AI407	Database Management Systems Laboratory	-	-	2	1	40	-	40	60	100
8	PCC	U18AI408	Python Programming Laboratory	-	-	2	1	40	-	40	60	100
9	OE	U18OE411	Open Elective-I based Laboratory	-	-	2	1	40	-	40	60	100
10	MC	U18MH415	Essence of Indian Traditional Knowledge	2	-	-	-	10	30	40	60	100
			Total:	17	2	8	21	280	180	460	540	1000
11	MC	U18CH416	Environmental Studies*	2	-	-	–	10	30	40	60	100

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]   Total Contact Periods/Week: 27   Total Credits: 21

Open Elective-I:
U18OE403A: Object Oriented Programming (CSE)
U18OE403B: Fluid Mechanics & Hydraulic Machines(CE)
U18OE403C: Mechatronics (ME)
U18OE403D: Web Programming (IT)
U18OE403E: Microprocessors (ECE)
U18OE403F: Strength of Materials (ME)

Open Elective-II:
U18OE401A: Applicable Mathematics (MH)
U18OE401B: Basic Electronics Engineering (ECE)
U18OE401C: Elements of Mechanical Engineering (ME)
U18OE401D: Measurements & Instrumentation (EIE)
U18OE401E: Fundamentals of Computer Networks (CSE)
U18OE401F: Renewable Energy Sources (EEE)
U18OE401G: Essential Mathematics and Statistics for Machine Learning (MH)

Open Elective-I based Lab:
U18OE411A: Object Oriented Programming Laboratory (CSE)
U18OE411B: Fluid Mechanics & Hydraulic Machines Laboratory (CE)
U18OE411C: Mechatronics Laboratory (ME)
U18OE411D: Web Programming Laboratory (IT)
U18OE411E: Microprocessors Laboratory (ECE)
U18OE411F: Strength of Materials Laboratory (CE)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE: WARANGAL – 15
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SCHEME OF INSTRUCTION & EVALUATION
V-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

KITSW Estd: 1980

[6Th+3P+Seminar]

Sl. No	Category	Course Code	Course Title	Periods/week L	T	P	Credits C	TA	CIE MSE	Total	ESE	Total Marks
1	MC	U18MH501	Universal Human Values –II	2	-	-	-	10	30	40	60	100
2	PE	U18AI502	Professional Elective - I / MOOC-I	3	-	-	3	10	30	40	60	100
3	PCC	U18AI503	Internet of Things	3	-	-	3	10	30	40	60	100
4	PCC	U18AI504	Software Engineering	3	-	-	3	10	30	40	60	100
5	PCC	U18AI505	Compiler Design	3	-	-	3	10	30	40	60	100
6	PCC	U18AI506	Machine Learning	3	-	-	3	10	30	40	60	100
7	PCC	U18AI507	Advanced Java Programming Laboratory	-	-	2	1	40	-	40	60	100
8	PCC	U18AI508	Internet of Things Laboratory	-	-	2	1	40	-	40	60	100
9	PCC	U18AI509	Machine Learning Laboratory	-	-	2	1	40	-	40	60	100
10	PROJ	U18AI510	Seminar	-	-	2	1	100	-	100	-	100
			Total:	17	1	8	19	280	180	460	540	1000
			Additional Learning*: *Maximum credits allowed for Honours/Minor in Engineering*	-	-	-	7	-	-	-	-	-
			Total credits for students opted for Honours/Minor:	-	-	-	19+7	-	-	-	-	-

Additional Learning: *Maximum credits allowed for Honours/Minor in Engineering*

* List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]   Total Contact Periods/Week : 26   Total Credits : 19

Professional Elective-I / MOOC-I:
U18AI502A: Computer Networks
U18AI502B: Advanced Database Management System
U18AI502C: Computer Graphics
U18AI502M: MOOCs course

MOOCs: Students are encouraged to do Massive Open Online Courses (MOOCs) on SWAYAM platform(https://www.swayam.gov.in) offered by NPTEL, CEC, IIM-B, IGNOU. Students shall contact the Head of the Department (HoD) to get their interested MOOCs approved by the HoD/Dean Academic Affairs for proper transfer of the credits for the MOOCs.

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SCHEME OF INSTRUCTION & EVALUATION
VI-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[6Th+3P+Miniproject]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
								CIE			ESE	Total
				L	T	P	C	TA	MSE	Total		Marks
1	HSMC	U18TP601	Quantitative Aptitude & Logical Reasoning	2	-	-	1	10	30	40	60	100
2	HSMC	U18MH602	Management, Economics and Accountancy	3	-	-	3	10	30	40	60	100
3	PE	U18AI603	Professional Elective - II / MOOC-II	3	-	-	3	10	30	40	60	100
4	PCC	U18AI604	Design and Analysis of Algorithms	3	-	-	3	10	30	40	60	100
5	PCC	U18AI605	Deep Learning	3	-	-	3	10	30	40	60	100
6	PCC	U18AI606	Computer Vision and Image Processing	3	1	-	4	10	30	40	60	100
7	PCC	U18AI607	Design and Analysis of Algorithms Laboratory	-	-	2	1	40	-	40	60	100
8	PCC	U18AI608	Deep Learning Laboratory	-	-	2	1	40	-	40	60	100
9	PCC	U18AI609	Computer Vision and Image Processing Laboratory	-	-	2	1	40	-	40	60	100
10	PROJ	U18AI610	Mini Project	-	-	2	1	100	-	100	-	100
			Total:	17	-	8	21	280	180	460	540	1000
			Additional Learning*: Maximum credits allowed for Honours/Minor in Engineering	-	-	-	7	-	-	-	-	-
			Total credits for students opted for Honours/Minor students:	-	-	-	21+7	-	-	-	-	-

* *List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula*

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]   Total Contact Periods/Week: 26   Total Credits: 21

Professional Elective-II / MOOC-II:
U18AI603A: Natural Language Processing
U18AI603B: Information Retrieval Systems
U18AI603C: Soft Computing
U18AI603M: MOOCs Course

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(NETWORKS)
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SCHEME OF INSTRUCTION & EVALUATION
VII-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[4Th+2P+1MC+1MP-I]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P	C	CIE				ESE	Total Marks
								TA	MSE	Total			
1	OE	U18OE701	Open Elective – III	3	-	-	3	10	30	40		60	100
2	PE	U18AI702	Professional Elective - III / MOOC-III	3	-	-	3	10	30	40		60	100
3	PE	U18AI703	Professional Elective - IV / MOOC-IV	3	-	-	3	10	30	40		60	100
4	PCC	U18AI704	Cloud Computing	3	-	-	3	10	30	40		60	100
5	PCC	U18AI705	Cloud Computing Laboratory	-	-	2	1	40	-	40		60	100
6	PCC	U18AI706	Natural Language Processing Laboratory	-	-	2	1	40	-	40		60	100
7	PROJ	U18AI707	Major Project - Phase – I	-	-	6	3	100	-	100		-	100
8	MC	U18AI708	Internship Evaluation	-	-	2	-	-	-	-		-	-
			Total:	12	–	12	17	220	120	340		360	700
			Additional Learning*: Maximum credits allowed forHonours/Minor in Engineering	-	-	-	7	-	-	-		-	-
			Total credits for students opted for Honours/Minor students:	-	-	-	17+7	-	-	-		-	-

List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

[L= Lecture, T = Tutorials, P = Practicals & C = Credits] Total Contact Periods/Week: 24Total Credits: 17

Open Elective-III:
U18OE602A: Disaster Management
U18OE602B: Project Management
U18OE602C: Professional Ethics in Engineering
U18OE602D: Rural Technology and Community Development

Professional Elective-III / MOOC-III:
U18AI702A: Reinforcement Learning
U18AI702B: Big Data Analytics
U18AI702C: Social and Information Network Analysis
U18AI702M: MOOCs course

Professional Elective-IV / MOOC-IV:
U18AI703A:Robotics
U18AI703B: Cognitive Computing Systems
U18AI703C: Cryptography and Network Security
U18AI703M: MOOCs course

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SCHEME OF INSTRUCTION & EVALUATION

VIII-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[3Th+1MP-II]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P	C	CIE			ESE	Total Marks	
								TA	MSE	Total			
1	PE	U18AI801	Professional Elective - V / MOOC-V	3	-	-	3	10	30	40	60	100
2	PE	U18AI802	Professional Elective - VI / MOOC-VI	3	-	-	3	10	30	40	60	100
3	OE	U18OE803	Open Elective - IV / MOOC-VII	3	-	-	3	10	30	40	60	100
4	PROJ	U18AI804	Major Project - Phase – II	-	-	14	7	60	-	60	40	100
			Total	9	-	14	16	90	90	180	220	400
			Additional Learning*: Maximum credits allowed for Honours/Minor in Engineering	-	-	-	7	-	-	-	-	-
			Total credits for students opted for Honours/Minor students:	-	-	-	16+7	-	-	-	-	-

* List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]

Total Contact Periods/Week: 23   Total Credits:16

Professional Elective-V / MOOC-V:
U18AI801A: Ethical Hacking
U18AI801B: Virtual Reality Technologies
U18AI801C: Robotic Process Automation
U18AI801M: MOOCs course

Professional Elective-VI/ MOOC-VI:
U18AI802A: Data Visualization
U18AI802B:Fog and Edge Computing
U18AI802C: Block Chain Technologies
U18AI802M: MOOCs course

Open Elective-IV/MOOC-VII:
U18OE803A: Operations Research
U18OE803B: Management Information Systems
U18OE803C: Entrepreneurship Development
U18OE803D: Forex &Foreign Trade
U18OE803M: MOOCs Course