



KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

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

काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६ ०१५ 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)

website: www.kitsw.ac.in

E-mail: principal@kitsw.ac.in

☎ : +91 9392055211, +91 7382564888

B.TECH. - COMPUTER SCIENCE & ENGINEERING (INTERNET OF THINGS) CSO

RULES & REGULATIONS FOR UNDERGRADUATE PROGRAMME B.TECH. 4-YEAR DEGREE PROGRAMME (URR-18R22)

(Applicable from the Academic Year 2022 - 23)

Choice Based Credit System (CBCS)

SYLLABI (I to VIII Semesters)



ISO 9001:2015

AICTE-CII: GOLD Category Institute

NAAC-'A' Grade Institute (CGPA: 3.21)

NIRF-2022 Rank Band : 201-250



Estd: 1980
KITSW

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కాకతీయ ప్రేక్షాగికి ఎవ్ విజ్ఞాన సంస్థాన, వరంగల్ - ౫౦౬ ౦౧౫ తెలంగాణ, భారత్

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• **B.Tech.** •

COMPUTER SCIENCE AND ENGINEERING

(Internet of Things) CSO

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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Estd: 1980
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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 ENGINEERING (NETWORKS) (Internet of Things)

VISION OF THE DEPARTMENT

- Attaining centre of excellence status in various fields of Computer Science and Engineering by offering worthwhile 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 - IoT	
PROGRAM EDUCATIONAL OBJECTIVES (PEOs)	<i>Within first few years after graduation, the COMPUTER SCIENCE AND ENGINEERING (IoT) graduates will be able to ...</i>
PEO1: Technical Expertise	<i>Apply the fundamental knowledge of the core courses of computer science and Internet of Things (IoT) for developing the effective software and smart applications.</i>
PEO2: Successful Career	<i>Excel in profession, higher education and entrepreneurship with updated technologies in software, internet of things and industrial based domains.</i>
PEO3: Soft Skills and Life Long Learning	<i>Exhibit professional ethics, effective communication, and team work in solving engineering problems by adapting contemporary research towards sustainable development of society.</i>

PROGRAM OUTCOMES (POs) & PROGRAM SPECIFIC OUTCOMES (PSOs)	
UG - COMPUTER SCIENCE & ENGINEERING - IoT	
PROGRAM OUTCOMES (POs)	<i>At the time of graduation, the COMPUTER SCIENCE AND ENGINEERING (IoT) graduates will be able to ...</i>
PO1: Engineering knowledge	<i>apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems</i>
PO2: Problem analysis	<i>identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences</i>
PO3: Design development of solutions	<i>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</i>
PO4: Conduct investigations of complex problems	<i>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</i>
PO5: Modern tool usage	<i>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</i>

PO6: The engineer and society	<i>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</i>
PO7: Environment and sustainability	<i>understand the impact of the professional engineering solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development</i>
PO8: Ethics	<i>apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice</i>
PO9: Individual and team work	<i>function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings</i>
PO10: Communication	<i>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</i>
PO11 Project management and finance	<i>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</i>
PO12: Life-long learning	<i>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</i>

PROGRAM SPECIFIC OUTCOMES (PSOs):	
PSO1: Software Development and Quality assurance	<i>Apply the fundamental knowledge of computer science and engineering in developing effective software for real world complex engineering problems by adapting advanced technologies.</i>
PSO2: Maintenance	<i>Design and configure various internet of things based smart applications using contemporary hardware and software tools.</i>
PSO3: Immediate professional practice	<i>Design and implement industrial IoT based solutions for improving operational efficiency by investigating existing industrial environment</i>



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (INTERNET OF THINGS)
 KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE:: WARANGAL - 15
 (An Autonomous Institute under Kakatiya University, Warangal)
 SCHEME OF INSTRUCTION & EVALUATION (Applicable from B21 batch)
 I-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM

URR-18R22

[5Th+4P+2MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P		C	CIE			ESE	Total Marks
									TA	MSE	Total		
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	U18PH103	Engineering Physics	3	1	-	4	10	30	40	60	100	
4	HSMC	U18MH104	English for Communication	2	-	2	3	10	30	40	60	100	
5	ESC	U18EE105	Basic Electrical Engineering	3	1	-	4	10	30	40	60	100	
6	ESC	U18EE106	Basic Electrical Engineering Laboratory	-	-	2	1	40	-	40	60	100	
7	ESC	U18CS107	Programming for Problem Solving using C Laboratory	-	-	2	1	40	-	40	60	100	
8	BSC	U18PH108	Engineering Physics Laboratory	-	-	2	1	40	-	40	60	100	
9	ESC	U18ME109	Workshop Practice	-	-	2	1	40	-	40	60	100	
10	MC	U18EA110	EAA *: Sports/Yoga/NSS	-	-	2	-	100	-	100	-	100	
11	MC	U18MH111	Universal Human Value-I (<i>Induction Programme</i>)	-	-	-	-	-	-	-	-	-	
Total:				14	3	12	22	310	150	460	480	1000	

[L= Lecture, T = Tutorials, P = Practical & 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,CSO Stream-II: CE, EIE, EEE, ECE, ECI,CSM



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KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE:: WARANGAL - 15
(An Autonomous Institute under Kakatiya University, Warangal)

URR-18R22

SCHEME OF INSTRUCTION & EVALUATION (Applicable from B21 batch)
II-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM

[5Th+2P+2MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
				L	T	P		CIE			ESE	Total Marks
								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	U18CH203	Engineering Chemistry	3	1	-	4	10	30	40	60	100
4	ESC	U18ME204	Engineering Drawing	2	-	4	4	10	30	40	60	100
5	ESC	U18CE205	Engineering Mechanics	3	1	-	4	10	30	40	60	100
6	ESC	U18CS207RR1	Data Structures through C Laboratory	-	-	2	1	40	-	40	60	100
7	BSC	U18CH208	Engineering Chemistry Laboratory	-	-	2	1	40	-	40	60	100
8	MC	U18CH209	Environmental Studies*	2	-	-	-	10	30	40	60	100
9	MC	U18EA210	EAA : Sports/Yoga/NSS*	-	-	2	-	100	-	100	-	100
Total:				16	3	10	21	240	180	420	480	900

[L= Lecture, T = Tutorials, P = Practical & 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, CSO Stream-II: CE, EIE, EEE, ECE, ECI, CSM

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



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SCHEME OF INSTRUCTION & EVALUATION (Applicable from B21 batch)

III-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM - CSE (IoT)

URR-18R22

[6Th+3P+1MC]

S.No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P		C	CIE			ESE	Total Marks
									TA	MSE	Total		
1	BSC	U18MH301	Engineering Mathematics - III	3	1	-	4	10	30	40	60	100	
2	HSMC	U18MH302	Professional English	-	-	2	1	100	-	100	-	100	
3	PCC	U18IN303	Object Oriented Programming through JAVA	3	-	-	3	10	30	40	60	100	
4	PCC	U18IN304	Fundamentals of Internet of Things	3	-	-	3	10	30	40	60	100	
5	PCC	U18IN306R22	Advanced Data Structures	3	-	-	3	10	30	40	60	100	
6	PCC	U18IN306	Computer Networks	3	-	-	3	10	30	40	60	100	
7	PCC	U18IN310	Object Oriented Programming through JAVA Laboratory	-	-	2	1	40	-	40	60	100	
8	PCC	U18IN311R22	Advanced Data Structures Laboratory	-	-	2	1	40	-	40	60	100	
9	PCC	U18IN312	Fundamentals of Internet of Things Laboratory	-	-	2	1	40	-	40	60	100	
10	MC	U18MH315	Essence of Indian Traditional Knowledge	2	-	-	-	10	30	40	60	100	
Total:				17	1	8	20	280	180	460	540	1000	

[L= Lecture, T = Tutorials, P = Practical & C = Credits] Stream-I: ME, CSE, IT, CSN, CSO Stream-II: CE, EIE, EEE, ECE, ECI, CSM

Total Contact Periods/Week : 26

Total Credits: 20

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 (Applicable from B21 batch)
IV-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM - CSE (IoT)

URR-18R22

[7Th+2P+1MC]

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	U18OE401	Open Elective-II	3	1	-	4	4	10	30	40	60	100
2	HSMC	U18TP402	Soft and Inter Personal Skills	-	-	2	1	1	100	-	100	-	100
3	OE	U18OE403	Open Elective-I	3	-	-	3	3	10	30	40	60	100
4	PCC	U18IN404	Theory of Computation	3	-	-	3	3	10	30	40	60	100
5	PCC	U18IN405	IoT Architecture and Protocols	3	-	-	3	3	10	30	40	60	100
6	PCC	U18IN406	Python Programming for IoT	3	-	-	3	3	10	30	40	60	100
7	PCC	U18IN407R22	Computer Organization and Architecture	3	-	-	3	3	10	30	40	60	100
8	PCC	U18IN408	Python Programming for IoT Laboratory	-	-	2	1	1	40	-	40	60	100
9	OE	U18OE411	Open Elective-I Laboratory	-	-	2	1	1	40	-	40	60	100
Total:				15	3	6	22	22	280	180	460	540	1000
10	MC	U18CH416	Environmental Studies*	2	-	-	-	-	10	30	40	60	100

[L= Lecture, T = Tutorials, P = Practical & C = Credits] Total Contact Periods/Week = 27 Total Credits: 22

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(CSN) U18OE401F: Renewable Energy Sources (EEE)	Open Elective-I based Lab: U18OE411A: Object Oriented Programming Lab (CSE) U18OE411B: Fluid Mechanics & Hydraulic Machines Lab (CE) U18OE411C: Mechatronics Lab (ME) U18OE411D: Web Programming Lab (IT) U18OE411E: Microprocessors Lab (ECE) U18OE411F: Strength of Materials Lab (CE)
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 SCHEME OF INSTRUCTION & EVALUATION (Applicable from B21 batch)
 V- SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM - CSE (IoT)

URR-18R22

[6Th+3P+Seminar]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
				L	T	P		CIE			ESE	Total Marks
								TA	MSE	Total		
1	HSMC	U18TP501	Quantitative Aptitude & Logical Reasoning	2	-	-	1	10	30	40	60	100
2	PE	U18IN502	Professional Elective - I/ MOOC-I	3	-	-	3	10	30	40	60	100
3	PCC	U18IN503	IoT with Cloud Computing	3	-	-	3	10	30	40	60	100
4	PCC	U18IN504R22	Software Engineering	3	-	-	3	10	30	40	60	100
5	PCC	U18IN505	Compiler Design	3	-	-	3	10	30	40	60	100
6	PCC	U18IN506	Database Management Systems	3	1	-	4	10	30	40	60	100
7	PCC	U18IN507R22	Advanced Java Laboratory	-	-	2	1	40	-	40	60	100
8	PCC	U18IN508	IoT with Cloud Computing Laboratory	-	-	2	1	40	-	40	60	100
9	PCC	U18IN509	Database Management Systems Laboratory	-	-	2	1	40	-	40	60	100
10	PROJ	U18IN510	Seminar	-	-	2	1	100	-	100	-	100
Total:				17	1	8	21	280	180	460	540	1000
Additional Learning*:Maximum credits allowed for Honours/Minor				-	-	-	7	-	-	-	-	-
Total credits 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 = Practical & C = Credits]

Total Contact Periods/Week :26

Total Credits :21

Professional Elective-I / MOOCs-I:U18IN502A: Operating System
 U18IN502B: Digital Image Processing
 U18IN502C: Data Mining and Data Warehousing
 U18IN502M: MOOCs course



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VI- SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM - CSE (IoT)

URR-18R22

[6Th+3P+1MC+Miniproject]

Sl. No	Category	Course Code	Course Title	Periods/week				Credits	Evaluation scheme				
				L	T	P	C		CIE			ESE	Total Marks
									TA	MSE	Total		
1	MC	U18MH601	Universal Human Values-II	2	1	-	-	-	10	30	40	60	100
2	OE	U18OE602	Open Elective – III	3	-	-	3	3	10	30	40	60	100
3	PE	U18IN603	Professional Elective - II / MOOC-II	3	-	-	3	3	10	30	40	60	100
4	PCC	U18IN604	Design and Analysis of Algorithms	3	-	-	3	3	10	30	40	60	100
5	PCC	U18IN605	Artificial Intelligence for IoT	3	1	-	4	4	10	30	40	60	100
6	PCC	U18IN606	Industrial IoT	3	-	-	3	3	10	30	40	60	100
7	PCC	U18IN607R22	Design and Analysis of Algorithms Laboratory	-	-	2	1	1	40	-	40	60	100
8	PCC	U18IN608	Artificial Intelligence for IoT Laboratory	-	-	2	1	1	40	-	40	60	100
9	PCC	U18IN609	Industrial IoT Laboratory	-	-	2	1	1	40	-	40	60	100
10	PROJ	U18IN610	Mini Project	-	-	2	1	1	100	-	100	-	100
Total:				17	1	8	20	20	280	180	460	540	1000
Additional Learning*:Maximum credits allowed for Honours/Minor				-	-	-	7	-	-	-	-	-	-
Total credits for Honours/Minor students:				-	-	-	20+7	-	-	-	-	-	-

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Open Elective-III: U18OE602A: Disaster Management U18OE602B: Project Management U18OE602C: Professional Ethics in Engineering U18OE602D: Rural Technology and Community Development	Professional Elective-II / MOOC-II: U18IN603AR22: Digital Electronics U18IN603B: Mobile Computing U18IN603C: Sensor Technology U18IN603M: MOOCs Course
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URR-18R22

SCHEME OF INSTRUCTION & EVALUATION (Applicable from B21 batch)
VII - SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM - CSE (IoT)

[4Th+2P+ MP-I+ internship]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P		C	CIE			ESE	Total Marks
									TA	MSE	Total		
1	HSMC	U18MH701	Management, Economics and Accountancy	3	-	-	3		10	30	40	60	100
2	PE	U18IN702	Professional Elective - III/ MOOC-III	3	-	-	3		10	30	40	60	100
3	PE	U18IN703	Professional Elective - IV / MOOC-IV	3	-	-	3		10	30	40	60	100
4	PCC	U18IN704	Privacy and Security in IoT	3	1	-	4		10	30	40	60	100
5	PCC	U18IN705	IoT Testing Tools Laboratory	-	-	2	1		40	-	40	60	100
6	PCC	U18IN706	Mobile Application Development Laboratory	-	-	2	1		40	-	40	60	100
7	PROJ	U18IN707	Major Project - Phase - I	-	-	6	3		100	-	100	-	100
8	MC	U18IN708	Internship Evaluation	-	-	2	-		-	-	-	-	-
Total:				12	1	12	18		220	120	340	360	700
Additional Learning*:Maximum credits allowed for Honours/Minor				-	-	-	7		-	-	-	-	-
Total credits for Honours/Minor students:				-	-	-	18+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 = Practical & C = Credits] Total Contact Periods/Week: 25 Total Credits: 18

Professional Elective-III/ MOOC-III: U18IN702A: Cyber Physical Systems U18IN702B: Big Data Analytics U18IN702C:RFID and Microcontrollers U18IN702M: MOOCs course	Professional Elective-IV/ MOOC-IV: U18IN703A:Embedded System Design U18IN703B: Augmented Reality and Virtual Reality U18IN703C: Narrowband IoT U18IN703M: MOOCs course
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (INTERNET OF THINGS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE:: WARANGAL - 15
(An Autonomous Institute under Kakatiya University, Warangal)

URR-18R22

SCHEME OF INSTRUCTION & EVALUATION (Applicable from B21 batch)

VIII - SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAM - CSE (IoT)

[3Th+ 1MP-II]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme			
				L	T	P		TA	MSE	Total	Total Marks
1	PE	U18IN801	Professional Elective - V / MOOC-V	3	-	-	3	10	30	40	60
2	PE	U18IN802	Professional Elective - VI / MOOC-VI	3	-	-	3	10	30	40	60
3	OE	U18OE803	Open Elective - IV / MOOC-VII	3	-	-	3	10	30	40	60
4	PROJ	U18IN804	Major Project - Phase - II	-	-	14	7	60	-	60	40
Total				9	-	14	16	90	90	180	400
Additional Learning*:Maximum credits allowed for Honours/Minor				-	-	-	7	-	-	-	-
Total credits 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 = Practical & C = Credits] Total Contact Periods/Week: 23 Total Credits: 16

Professional Elective-V / MOOC-V: U18IN801A: Software Defined Networks U18IN801B: Smart Grid U18IN801C: Introduction to Robotics Systems U18IN801M: MOOCs course	Professional Elective-VI / MOOC-VI: U18IN802A: Fog and Edge Computing U18IN802B: Internet of Medical Things U18IN802C: Block Chain Technology U18IN802M: MOOCs course	Open Elective-IV/MOOCs-VII: U18OE803A: Operations Research U18OE803B: Management Information Systems U18OE803C: Entrepreneurship Development U18OE803D: Forex & Foreign Trade U18OE803M: MOOCs Course
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KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

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

కాకతీయ ప్రాధ్మికాగికీ ఁవ్ విజ్ఞాన సఁస్థాన, వరఁగల్ - 506 015 తెలఁగానా, భారత

కాకతీయ సాఁకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - 506 015 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)

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RULES AND REGULATIONS FOR UNDERGRADUATE PROGRAMME

B.TECH 4-YEAR DEGREE PROGRAMME (URR-18)

CHOICE BASED CREDIT SYSTEM (CBCS)

(Applicable from the academic year 2018-19)

1. INTRODUCTION

- 1.1 Kakatiya Institute of Technology & Science, Warangal (KITSW) is a UGC autonomous institute under Kakatiya University (KU) Warangal. The institute offers 4 year (8 semesters) Bachelor of Technology (B.Tech) degree programme, under Choice Based Credit System (CBCS) with effect from the academic year (A.Y) 2018-19.
- 1.2 The provisions contained in these regulations given the conditions for imparting course of instructions, conducting examinations and evaluation of students' performance leading to B.Tech. 4-year degree programme to be offered by the Kakatiya Institute of Technology & Science, Warangal and awarded by Kakatiya University, Warangal.
- 1.3 These regulations shall be called the *Kakatiya Institute of Technology & Science, Warangal (KITSW) regulations for the award of B.Tech 4-year degree programme by Kakatiya University, Warangal.*
- 1.4 They shall come into effect from the date of getting approval from the Academic Council of the Kakatiya Institute of Technology & Science, Warangal
- 1.5 They shall be applicable for all students enrolling for B.Tech 4-year degree programme at the Kakatiya Institute of Technology & Science, Warangal from the academic year 2018-19.

2. DEFINITIONS

- 2.1 "**B.Tech.**" means Bachelor of Technology, an Under Graduate Degree awarded from the Kakatiya University, Warangal
- 2.2 "**University**" means Kakatiya University, Warangal
- 2.3 "**Institute**" means Kakatiya Institute of Technology & Science, Warangal
- 2.4 "**UGC**" means University Grants Commission, New Delhi
- 2.5 "**AICTE**" means All India Council for Technical Education, New Delhi
- 2.6 "**MHRD**" means Ministry of Human Resource & Development, Govt. of India, New Delhi
- 2.7 "**TSCH**" means Telangana State Council for Higher Education, Govt. of Telangana, Hyderabad
- 2.8 "**GB**" means Governing Body of the Institute
- 2.9 "**AC**" means Administrative Committee of the Institute
- 2.10 "**FC**" means Finance Committee of the Institute
- 2.11 "**Academic Council**" means Academic Council of the Institute
- 2.12 "**Principal**" means Principal of the Institute
- 2.13 "**Dean**" means Dean of specific affairs of the Institute
- 2.14 "**HoD**" means Head of the Department of specific programme offered by the Institute
- 2.15 "**BoS**" means Board of Studies in the engineering of a specific programme offered by the Institute
- 2.16 "**CoE**" means Controller of Examinations of the Institute.

3. UNDER GRADUATE PROGRAMMES

- 3.1 The Institute shall offer the following Under Graduate Programmes under CBCS:
 1. B.Tech Civil Engineering (CE)
 2. B.Tech Mechanical Engineering (ME)
 3. B.Tech Electronics & Instrumentation Engineering (EIE)
 4. B.Tech Electrical & Electronics Engineering (EEE)
 5. B.Tech Computer Science & Engineering (CSE)

- 6.6 **No late registration shall be permitted after 12th working day** from the scheduled date of commencement of class work for that academic year.
- 6.7 Only those students will be permitted to register who have
- cleared all institute and hostel dues of previous semesters
 - paid all required prescribed fees for the current academic year
 - not been debarred / detained from registering for a specified period on disciplinary or any other grounds
 - cleared the minimum academic requirement as detailed in Regulation No. 15

7. CURRICULUM

- 7.1 The Model curriculum/ Course structure as suggested by AICTE, New Delhi; CBCS and Credit Based Semester System (CBSS) as denoted by UGC, New Delhi is followed for all UG programmes.
- 7.2
- The duration of the programme leading to B.Tech degree will be 8 semesters (4 academic years)
 - However, for the lateral entry students, the duration of the program leading to B.Tech degree will be 6 semesters (3 academic years)
- 7.3 The curricula for different degree programmes as proposed by the department and recommended by the BoS shall have the approval of the Academic Council.
- 7.4 As suggested by AICTE, the courses offered for UG programme are broadly classified as: Basic Science Courses (BSC), Engineering Science Courses (ESC), Humanities and Social Sciences including Management Courses (HSMC), Professional Core Courses (PCC), Professional Elective (PE) courses, Open Elective (OE) courses, Mandatory Courses (MC) and Project (PROJ) based courses
- 7.5 The courses offered would have a **Lecture - Tutorial - Practical (L-T-P)** component to indicate contact hours. Separate laboratory (practical) course may exist (0-0-P) in certain cases as decided.
- 7.6 The academic programmes of the Institute follow the credit system.
- 7.7 Each course shall have credits(C), which reflects its weightage. The number of credits of a course in a semester shall ordinarily be calculated as under:

$$\text{Number of credits of a course, } C = L + T + (P/2)$$

where *L, T, P* represent the No. of Lecture, Tutorial and Practical hours / week

- 7.8 The students admitted for B.Tech. programme under Lateral Entry scheme have to be offered a mandatory course on "Environmental Studies" in the 4th semester of B.Tech. programme.
- 7.9 **Course Code:** Each course offered in the Undergraduate (B.Tech.) curriculum at this institute shall be listed by using a total of 8 digits, as follows:

Ex: **U18CE106**

- The first letter, to represent the **Under Graduate Programme**
Ex. U for Undergraduate Course
- The next two numbers, to represent the year in which the syllabus is proposed / revised.
Ex. 18 for the year 2018 from which syllabus is applicable for the batches admitted from academic year 2018-19
- The next two letters, to represent the concerned department offering that course.
Ex. CE for Civil Engineering
- The last three numbers, to represent the course number and semester in which it is being offered.

Ex. XYZ; X - Semester number ; YZ - Course number

106 represents course number 06 offered in first semester

In general, a **course code "U18CE106"** represents an **Undergraduate Course number-06 for the batches admitted from the year 2018 offered by the Department of Civil Engineering in first semester.**

- 7.10 The syllabus of each course in the B.Tech. curriculum shall be divided into four (4) units.

8. ATTENDANCE

- 8.1 All the students are normally required to have 100% attendance in aggregate. However, condonation for shortage of attendance upto 25% may be granted by the principal based on recommendation of HoD concerned.

- 8.2 The condonation for shortage of attendance upto 25% (as mentioned in Regulation No. 8.1) shall be taken up only when the student takes prior permission for his absence stating fully the genuine reasons along with supporting documents to the HoD concerned.
- 8.3 Hence, students not having the mandatory requirement of minimum 75% of attendance in aggregate shall be detained and shall not be permitted to appear for the MSE-II & ESE of that semester.
- 8.4 All such students who are detained have to repeat the entire semester when it is offered, by following the due registration procedure.
- 8.5 Attendance of all courses shall be entered before the end of each working day by the faculty concerned through the College Management System (CMS) portal of the institute website. Students are advised to monitor the status of their attendance through this CMS portal.
- 9. CONDUCT AND DISCIPLINE**
- 9.1 All students shall be required to conduct themselves in a manner befitting the reputation of the institution, within and outside the premises of the Institute; and are expected to complete their studies without any break.
- 9.2 As per the order of Hon'ble Supreme Court of India, ragging in any form is strictly banned. Involvement of a student in ragging will be considered as a gross indiscipline and may lead to his / her expulsion from the Institute.
- 9.3 Detailed rules regarding the conduct and discipline (code of conduct) are made available on Institute website.
- 10. EVALUATION PROCEDURE**
- 10.1 The evaluation of students in every course of 4-year B.Tech. programme (8 semesters) and Lateral Entry students of B.Tech. programme (6 semesters), is a continuous process and is based on their performance in different examinations as mentioned below:
- Sessional, involving **Continuous Internal Evaluation (CIE)** conducted all through the semester which includes **Teachers Assessment (TA)** through assignments and **Mid-Semester Examinations (MSE)**
 - Terminal, often designated as **End Semester Examination (ESE)** which includes written examination for theory courses and practical/ design/ drawing examination with built-in oral part for laboratory/ design / drawing courses.
- 10.2 A student's performance in a course (subject) shall be judged by taking into account the result of CIE and ESE together.
- 10.3 CIE and ESE shall have 40:60 weightage i.e. CIE carrying 40% weightage and ESE carrying 60% weightage.
- 10.4 **Continuous Internal Evaluation (CIE) for Theory Course:**
- 10.4.1 CIE throughout the semester shall consist of TA and MSE.
- 10.4.2 The distribution given to each component of CIE for a theory course is given below:
- | S. No. | Particulars | Weightage |
|-----------------|---|-----------|
| 1. | Teacher's Assessment (TA) (Assignments) | 10% |
| 2. | Mid Semester Examination (MSE) (MSE-I & MSE-II) | 30% |
| Total Weightage | | 40% |
- 10.4.3 **TA:**
- There shall be 2 Assignments and 2 Minor exams (Quiz/Slip test, etc.) for each course at regular intervals of time
 - Minor-I shall be based on Unit-I syllabus, Minor-II shall be based on Unit-III syllabus, Assignment-I shall be based on Unit-I & Unit-II syllabi and to be submitted before MSE-I, Assignment-II shall be based on Unit-III & Unit-IV syllabi and to be submitted before MSE-II.
 - Average of Assignment-I, Assignment-II, Minor-I and Minor-II marks shall be taken under TA
- 10.4.4 **MSE:**
- There shall be two mid semester examinations (MSE-I and MSE-II) of two-hour duration each.
 - It is mandatory for the student to take both MSEs
 - MSE evaluation shall be done as given below:
MSE marks awarded = (70% of the best of MSE-I & MSE-II marks)
+ (30% of the other MSE marks)

Ex: A student secured following marks

MSE-I marks = 10 out of 30

MSE-II marks = 20 out of 30

The MSE marks awarded will be = (70% of 20) + (30% of 10) = 14 + 3 = 17

10.4.5 The marks obtained by the students in MSE must be submitted to the Controller of Examination (CoE) by the teachers within 1 week from the date of conduct of the examination.

10.4.6 The dates for MSE and ESE will be declared by the CoE in consultation with the Dean, Academic Affairs.

10.5 End Semester Examination (ESE) for Theory Course:

There shall be an End Semester Examination (ESE) at the end of each semester for three hour duration for each course.

10.6 Continuous Internal Evaluation (CIE) for Practical (Laboratory) Course:

10.6.1 CIE for practical course shall carry 40% weightage.

10.6.2 CIE throughout the semester shall consist of the following:

Assessment	Weightage
Regular Experimentation / Job work and Viva-voce	20%
Regular submission of record	10%
Quiz / Skill test / Viva-voce at the end of semester	10%
Total Weightage	40%

10.7 End Semester Examination (ESE) for Practical (Laboratory) Course:

10.7.1 There shall be an ESE at the end of each semester for three hour duration for each practical course.

10.7.2 The ESE for practical course shall carry 60% weightage.

10.7.3 The marks distribution at ESE shall be as follows:

Assessment	Weightage
Procedure / Experimentation / Tabulation / Result, as applicable ...	45%
Viva-voce	15%
Total Weightage	60%

10.8 Continuous Internal Evaluation (CIE) for Seminar & Mini Project :

10.8.1 Seminar:

- d) The HoD shall constitute a *Department Seminar Evaluation Committee (DSEC)*
- e) DSEC shall allot a faculty supervisor to each student for guiding on (i) selection of topic (ii) literature survey and work to be carried out (iii) preparing a report in proper format and (iv) effective seminar presentation
- f) There shall be only continuous Internal Evaluation (CIE) for seminar
- g) The CIE for seminar is as follows:

Assessment	Weightage
Seminar Supervisor Assessment	20%
Seminar Report	30%
Seminar Paper	20%
DSEC Assessment: <i>Oral presentation with PPT and viva-voce</i>	30%
Total Weightage:	100%

Note: It is mandatory for the candidate to appear for oral presentation and Viva-voce to qualify for course evaluation.

- h) **Seminar Topic:** The topic should be interesting and conducive to discussion. Topics may be found by looking through recent issues of peer reviewed Journals / Technical Magazines on the topics of potential interest
- i) **Report:** Each student is required to submit a well-documented report on the chosen seminar topic as per the format specified by DSEC.
- j) **Anti-Plagiarism Check:** The seminar report should clear plagiarism check as per the Anti-Plagiarism policy of the institute.

- k) **Presentation:** Each student should prepare PPT with informative slides and make an effective oral presentation before the *DSEC* as per the schedule notified by the department
- l) The candidate has to register the Seminar as supplementary examination in the following cases:
 - (i) student is absent for oral presentation and viva-voce
 - (ii) student fails to submit the report in prescribed format
 - (iii) student fails to fulfil the requirements of seminar evaluation as per specified guidelines
- m) Supplementary examination for seminar
 - (i) The CoE shall send a list of candidates registered for supplementary to the HoD concerned
 - (ii) The *DSEC*, duly constituted by the HoD, shall conduct seminar evaluation and send the award list to the CoE within the stipulated time

10.8.2 Mini Project:

- a) The HoD shall constitute a *Departmental Mini Project Evaluation Committee (DMPEC)*
- b) Every student shall take up independent Mini project on innovative ideas. However, wherever not feasible a group of 2 to 4 students shall be allowed to take up mini project. The *DMPEC* shall take a decision on number of students in a group.
- c) *DMPEC* shall allot a faculty supervisor to each student for guiding on (i) selection of topic (ii) literature survey and work to be carried out (iii) preparing a report in proper format and (iv) effective mini project oral presentation
- d) There shall be only Continuous Internal Evaluation (CIE) for mini project
- e) The CIE for mini project is as follows:

Assessment	Weightage
Mini Project Supervisor Assessment	20%
Working model / process / software package / system developed	20%
Mini Project report	20%
Mini Project paper	10%
Video pitch	10%
<i>DMPEC Assessment: Oral presentation with PPT and viva-voce</i>	20%
Total Weightage:	100%

Note: It is mandatory for the candidate to appear for oral presentation and Viva- voce to qualify for course evaluation.

- i) **Mini Project Topic:** The topic should be interesting and conducive to discussion. Topics may be found by looking through recent issues of peer reviewed Journals/ Technical Magazines on the topics of potential interest
- ii) **Working Model:** Each student is required to develop a working model/ process/ system on the chosen work and demonstrate before the *DMPEC* as per the dates specified by *DMPEC*
- iii) **Report:** Each student is required to submit a well-documented report on the chosen seminar topic as per the format specified by *DMPEC*
- iv) **Anti-Plagiarism Check:** The seminar report should clear plagiarism check as per the Anti-Plagiarism policy of the institute
- v) **Presentation:** Each student should prepare PPT with informative slides and make an effective oral presentation before the *DMPEC* as per the schedule notified by the department
- vi) **Video Pitch:** Each student should create a pitch video, which is a video presentation on his/ her mini project. Video pitch should be no longer than 5 minutes by keeping the pitch concise and to the point, which shall also include key points about his/ her business idea / plan (*if any*) and social impact
- f) The candidate has to register the Mini project as supplementary examination in the following cases:
 - (i) Student is absent for oral presentation and viva-voce
 - (ii) Student fails to submit the report in prescribed format

- (iii) Student fails to fulfill the requirements of Mini project evaluation as per specified guidelines.
- g) Supplementary examination for mini project
 - (i) The CoE shall send a list of candidates registered for supplementary to the HoD concerned
 - (ii) The *DMPEC*, duly constituted by the HoD, shall conduct Mini project evaluation and send the award list to the CoE within the stipulated time.

10.9 Evaluation for Major Project Work:

10.9.1 Final year major project work is a team work and represents the culmination of study towards the B. Tech degree. **Major project offers an opportunity to integrate the knowledge acquired from various courses and apply it to solve real-world complex engineering problems.** The **Student Learning Assessment Process (SLAP)** shall include good number of presentations, demonstration of work undertaken, submission of a project report, writing project paper in scientific journal style & format, preparing project poster and creating video pitch on the complete project work.

10.9.2 Activities of major project SLAP shall be planned in such a way to ensure that the students acquire the essential Knowledge, Skills and Qualities (KSQ) of a professional engineer.

10.9.3 Major project work shall be normally conducted in two stages: Major project work.

Phase-I in seventh semester and Major project work *Phase-II* in eighth semester.

Nearly 50 - 75% of the proposed work to be completed in 7th semester as *Phase-I* and the remaining work to be continued and completed in 8th semester as *Phase-II*

10.9.4 Major Project *Phase-I*:

- a) Every student is expected to put approximately **72 hours of work** into the major project *phase-I* course over the 12 weeks of 7th semester
- b) The HoD shall constitute a *Departmental Project Evaluation Committee (DPEC)*
- c) The convener DPEC shall allot faculty supervisors to all project teams for guiding on (i) project objectives and expected deliverables (ii) plan their project work and timeline (iii) enough resources for successful project completion (iv) Knowledge, Skills and Qualities (KSQ) to be acquired to propose solutions to the identified real-world problem for the project work (v) preparing a well-documented report in proper format and (iv) effective major project oral presentation
- d) The project supervisors shall ensure students focus on the project objectives, expected deliverables and students have sufficient resources for successful project completion
- e) The project supervisors are also expected to continuously emphasize and guide the students on following project timeline, meeting cadence, activity journaling in project log book
- f) There shall be only Continuous Internal Evaluation (CIE) for Major Project *Phase-I*
- g) CIE for the Major Project *Phase-I* in seventh semester is as follows:

Major project work <i>Phase-I</i> Assessment (7 th semester)	Weightage
A. Supervisor Assessment	20%
B. DPEC Assessment (i) Registration Presentation (10%) (ii) Progress Presentation-I (20%) (iii) Project progress*: Part of working model/ process/software package/system developed (30%) (iii) Well-documented Progress Report on <i>Phase-I</i> work (10%) (iv) Video pitch on <i>Phase-I</i> (10%)	80%
Total Weightage	100 %

* Students are advised to complete major part of the project in *phase-I* only

- g) **Working Model:** Every project team shall be required to develop a working model/ process/software package/system, on the chosen work. The progress made in this shall be demonstrated during progress presentation-I at the end of *phase-I* and the completed working model/ process/software package/system before the DPEC as per the dates specified by DPEC at the end of *phase-II*.
- h) **Progress Report on *phase-I*:** Every project team shall be required to submit a well-documented progress report on dissertation phase-I as per format specified by DPEC.
- i) **Video pitch on *phase-I*:** Every project team shall be required to create a pitch video, which is a video presentation on their major project work *phase-I*. It should be 3 to 5-minute-long video (no longer than 5 minutes), highlight the progress made at various stages during *phase-I* project implementation
- j) A student shall register for supplementary examination for the Major project work *phase-I* in the following cases:
 - (i) Student is absent for oral presentation and viva-voce as part of progress presentation-I
 - (ii) Project team fails to submit the progress report on *phase-I* in prescribed format
 - (iii) Project team fails to submit the video pitch on the progress made during the *phase-I* period.
 - (iv) Student fails to fulfill the requirements of major project work *phase-I* evaluation as per specified guidelines
- k) Supplementary examination for major project work *phase-I*
 - (i) The CoE shall send the list of students, registered for supplementary examination, to the HoDs concerned
 - (ii) The DPEC shall conduct major project *phase-I* supplementary exam and send the award list to the CoE within the stipulated time

10.9.5 Major Project Phase-II:

- a) All the major project teams shall take the *phase -I* work forward and complete the remaining work as *Phase-II* in the 8th semester.
- b) Every student is expected to put approximately 168 hours of work into the major project *phase-II* course over the 12 weeks of 8th semester
- c) The project supervisors are expected to guide the students to systematically continue the *phase-I* work, useful work during inter-semester break, meeting the deadlines as proposed in project timeline
- d) The project supervisors shall ensure students focus on the project objectives and expected deliverables and ensure students have sufficient resources for successful project completion
- e) The project supervisors are also expected to continuously emphasize and guide the students on following project timeline, meeting cadence, activity journaling in project log book.
- f) The evaluation for Major Project work *Phase-II*: There shall be Continuous Internal Evaluation (CIE) and End Semester Examination (ESE). The evaluation for *phase-II* shall be as given below:

Assessment	Weightage
A. CIE	
(i) Supervisor Assessment (10%)	
(ii) DPEC Assessment (50%)	
(a) Progress presentation-II (10%)	
(b) Final presentation (10%)	
(c) Working model / process / software package / system developed (20%)	
(d) Project video pitch (5%)	
(e) Project paper (5%)	60%
B. ESE	
(i) Well-documented project report (15%)	
(ii) Oral presentation with PPTs and viva-voce (15%)	
(iii) Project poster (5%)	40%
Total Weightage	100%

- g) **Working Model:** Every project team shall be required to develop a working model/ process/software package/system, on the chosen work. The completed working model/ process/software package/system shall be demonstrated during final presentation at the end of *phase-II*.
- h) **Video pitch:** Every project team shall be required to create a pitch video, which is a video presentation on their major project work *phase-I & phase-II*. The project team shall present the produced video pitch during Final presentation
- i) **Project poster:** At the end, the project teams shall present their project in the form of posters (A2 size). The teams shall have to present their work during the poster presentation session scheduled at the end of the 8th semester, at the time of demonstration of complete prototype / working model / software package / system developed.
- j) **Well-documented plagiarism-cleared project report:** Every project team shall be required to submit a well-documented project report on the work carried out, as per the format specified by the DPEC. The report should clear plagiarism check as per the anti-plagiarism policy-2020 of the institute.
- k) A student shall register for supplementary examination for the Major project work *phase-II* in the following cases:
- Student is absent for oral presentation and viva-voce as part of ESE presentation
 - Student fails to fulfill the requirements of major project work *phase-II* evaluation as per specified guidelines
- l) Supplementary examination for major project work *phase-II*
- The CoE shall send the list of students, registered for supplementary examination, to the HoDs concerned
 - The DPEC, duly constituted by the HoD, shall conduct major project *phase-II* supplementary exam and send the award list to the CoE within the stipulated time
- 10.10 **Evaluation for Internship:**
- 10.10.1 The students shall undergo 6-8 weeks internship during summer/winter vacation at industry/R&D organization / Academic Institutes like IITs, IIITs & NITs.
- 10.10.2 The students preferably shall undergo internship at one organization only. In case of any difficulty, the stipulated period of internship shall be completed at different organizations with minimum of one week internship at every stage.
- 10.10.3 The internship evaluation shall be done in the VII semester of study and hence the students shall complete the prescribed period of internship before start of VII semester (from end of II semester to commencement of VII semester).
- 10.10.4 The internship evaluation shall be done by *Department Internship Evaluation Committee (DIEC)* based on the submitted report by student and oral presentation.
- 10.10.5 There shall be only Continuous Internal Evaluation (CIE) for internship evaluation.
- 10.10.6 The CIE for the Internship evaluation in VII semester shall be as below:

Internship evaluation	Weightage
A. Internship Supervisor's Assessment - Feedback from the internship supervisor - on completion of internship assignment / work (20%) - Feedback from the internship supervisor - on quality of work in internship assignment / work (10%) - Feedback from the internship supervisor - internship log book (10%) - Feedback from the internship supervisor - on attendance, punctuality and work hours (10%)	50%
B. DIEC Assessment - Internship duration (8 /6 weeks) (15% / 10%) - Internship Report (20%) - Oral Presentation (with PPT) and viva voce (15%)	50%
Total Weightage:	100%

Note: It is mandatory for the student to appear for oral presentation (with PPT) and viva voce to qualify for course evaluation

- (a) **Internship Report:** Each student is required to submit a well-documented internship report (both *soft copy and softbound hard copy*) as per format specified by DIEC
- (b) A student shall register for supplementary examination for the internship evaluation in the following cases:
 - (i) absent for oral presentation and viva-voce
 - (ii) fails to submit the internship report in prescribed format
 - (iii) fails to fulfill the requirements of internship evaluation as per specified guidelines
- (c) Supplementary examination for internship evaluation
 - (i) The CoE shall send the list of students, registered for supplementary examination, to the HoDs concerned
 - (ii) The DIEC, duly constituted by the HoD, shall conduct internship evaluation supplementary exam and send the award list to the CoE within the stipulated time

10.11 Evaluation of MOOCs:

- 10.11.1 a) **SWAYAM-MOOCs:** Massive Open Online Courses (MOOCs) are such online courses which are developed as per the pedagogy and made available on the SWAYAM (Study Web of Active-learning by Young and Aspiring Minds) platform of *Government of India*
- b) **SWAYAM** shall notify to all Institutions, on 1st June, 1st November every year, the list of online learning courses going to be offered in the forth coming semester.
- 10.11.2 a) The student shall be allowed to register for MOOCs courses for the designated Professional electives and Open electives mentioned in the curriculum.
- b) The student shall select a relevant MOOCs course carrying 3 credits.
- 10.11.3 The Institutional MOOCs coordinator with the help of departmental MOOCs coordinator shall guide the students throughout the course.
- 10.11.4 **Evaluation and Certification of MOOCs:**
 - a) The Principal Investigator (PI) shall be a Subject Matter Expert (SME) belonging to a reputed educational institution, called Host Institution
 - b) The host Institution and PI shall be responsible for evaluating the registered students for MOOCs course
 - c) After conduct of examination and completion of the evaluation, the PI through host institution shall award Marks/Grade as per the evaluation scheme announced.
- 10.11.5 **Credit Mobility of MOOCs:**
 - a) Institution shall allow the credit mobility for the courses earned through MOOCs.
 - b) A certificate regarding successful completion of the MOOCs courses shall be issued through host Institution and sent to the parent institution.
 - c) The parent institution shall give equivalent credit weightage to the students for the credits earned through online learning courses through SWAYAM platform in the credit plan of the programme.
- 10.11.6 In case the student is unable to complete the MOOCs course, he/she shall be allowed to select one of courses listed under respective PE/OE offered at institute/department concerned and appear for supplementary examination. In such case, the student is deemed to have passed the course, if he/she scores minimum 35% of maximum marks allotted to the course in the registered supplementary ESE only (i.e. 35 marks out of 60 in ESE).

11. MINIMUM REQUIREMENT FOR PASSING A COURSE

- 11.1 **Theory Course:** A student is deemed to have passed in a theory course, if he / she secures
 - a) 35 percent of marks assigned to End Semester Examination (ESE) **and**
 - b) 35 percent of marks assigned to the Mid Semester Examination (MSE) & End Semester Examination (ESE) of the course taken together **and**
 - c) 35 percent of marks assigned to Teacher's Assessment (TA), Mid Semester Examination (MSE) and End Semester Examination (ESE) of the course taken together.
- 11.2 The marks assigned to MSE will be considered as per the Regulation no. 10.4.4

- 11.3 **Laboratory Course:** A student is deemed to have passed in a laboratory course, if he/she secures
 a) 35 percent of marks assigned to End Semester Examination (ESE) **and**
 b) 35 percent of marks assigned to the Teacher's Assessment (TA) and End Semester Examination (ESE) of the laboratory course taken together.

12. GRADING SYSTEM

- 12.1 At the end of the semester a student is awarded a letter grade in each of his / her courses taking into account the total marks secured (X) in that course
 where, X = Marks secured in CIE + Marks secured in ESE
- 12.2 For arriving at a grade obtained by a student in a particular course (subject), initially numeric marks obtained by the student out of 100 are to be determined. Once a numeric mark is obtained, the same is to be converted to a letter grade following the guidelines given in 12.3 below.
- 12.3 The Institute shall follow absolute grading system. The grades will be awarded to each course as under:

Grade	Total Marks Secured (X)
S	$X \geq 90$
A	$80 \leq X < 90$
B	$70 \leq X < 80$
C	$60 \leq X < 70$
D	$45 \leq X < 60$
P	$35 \leq X < 45$
F	$X < 35$

- 12.4 The typical grades and their numerical equivalents on 10-point scale (called Grade Points) are as follows:

Performance	Letter Grade	Grade Points (G _i)
Superior	S	10
Excellent	A	9
Very Good	B	8
Good	C	7
Average	D	6
Pass	P	4
Fail	F	0

- 12.5 **F-Grade** is a Fail Grade. The course in which the student has earned F-Grade will be termed as backlog course.
- 12.6 In addition, there shall be a transitional **M-Grade**. M-Grade for "Debarred" due to indiscipline / malpractice during examination.
- 12.7 A Semester Grade Point Average (SGPA) will be computed for each semester. The SGPA will be calculated as follows:

$$SGPA = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}$$

where 'n' is the no. of courses (subjects) offered (excluding mandatory non-credit courses) for the semester, 'C_i' is the credits allotted to a particular course, 'G_i' is the grade-points carried by the letter corresponding to the grade awarded to the student for the course as illustrated in 12.4.

- 12.8 The SGPA would indicate the performance of the student in the semester to which it refers. SGPA will be rounded off to the second place of decimal and recorded as such.
- 12.9 Starting from the second semester, at the end of each semester, a Cumulative Grade Point Average (CGPA) will be computed for every student as follows:

$$CGPA = \frac{\sum_{i=1}^m C_i G_i}{\sum_{i=1}^m C_i}$$

where 'm' is the total number of courses (subjects) the student has been offered from the first semester onwards upto and including the present semester, 'C_i' and 'G_i' are as explained in 12.7.

- 12.10 The CGPA would indicate the cumulative performance of the student from the first semester up to the end of the semester to which it refers. CGPA will be rounded off to the second place of decimal and recorded as such.
- 12.11 SGPA and CGPA are calculated in consideration of only credits cleared, i.e. F-Grade credits are not included for calculation.
- 13. SUPPLEMENTARY EXAMINATIONS**
- 13.1 A student who obtained the F-Grade in a course (theory or practical) can appear in a subsequent End Semester Examination (ESE) in the same course as supplementary candidate.
- 13.2 However the marks secured in Continuous Internal Evaluation (CIE) by the student in that course during the semester study shall remain unaltered.
- 13.3 The students those who have passed in the supplementary examination will be awarded grade with '**' marked on the courses passed in the supplementary.
- 13.4 **Makeup Examination for VIII semester courses:**
Makeup Examination for the students having backlog courses at VIII semester of 4th year B.Tech. programme shall be conducted immediately after the release of VIII semester regular examinations result.
- 14. REVALUATION**
- a) Revaluation is allowed for only theory courses.
- b) If the award of the revaluator varies from the original award by less than or equal to 20% of maximum marks prescribed for the course, the original award shall be taken as final.
- c) If the award of the revaluator varies from the original award by more than 20% of the maximum marks prescribed for the course, the answer script will be examined by the second revaluator. If the award of the both revaluators is more than 20% of the maximum marks prescribed for the course, then average of the two revaluated awards thus available shall be taken as final. Otherwise, the original award shall be taken as final.
- 15. CONDITIONS FOR PROMOTION**
- 15.1 A student shall have to satisfy the attendance requirements for the semester (as per the Regulation No. 8) for promotion to the next higher semester. In addition,
- a) for promotion to the fifth semester, a student should not have more than four backlogs in the first and second semesters taken together.
- b) for promotion to the seventh semester, a student should not have more than four backlogs in the courses of first to fourth semester taken together.
- c) the grade (marks) secured in mandatory non-credit courses will not be counted for the purpose of backlogs. However, a minimum P-Grade is compulsory in those courses for the award of the degree.
- 16. IMPROVEMENT EXAMINATION**
- 16.1 Students who wish to improve their SGPA / CGPA are permitted for SGPA / CGPA improvement only for theory courses. The student may opt to re-appear all the courses of a semester at the immediately succeeding End Semester Examination (ESE) for improving his / her grades. However, the students should clear all the courses of a particular semester in which he / she intends to take an improvement examination.
- 16.2 Further, when once the student appears for the improvement examination, he / she shall forego the grades secured in the earlier End Semester Examination (ESE) in the whole set of courses prescribed for that semester. However, the marks secured in Continuous Internal Evaluation (CIE) by the student in those courses during the semester study shall remain unaltered.
- 16.3 Students those who have re-appeared for improvement will be awarded grade with '\$' marked on the courses appeared for improvement examination. '\$' will state the grade improvement. Such improved grades will not be counted for the award of Prizes, Medals and Rank.
- 16.4 However, the students who register for improvement examinations and wish to drop from appearing the examinations, by written application to the CoE, before commencement of examinations, shall be permitted to retain their earlier grades.

17. GRADUATION REQUIREMENT

- 17.1 A student shall be declared to be eligible for award of the B.Tech. degree, if he / she has registered and completed all the courses with a minimum P-grade scored in every course and secured a total of stipulated 160 credits.
- 17.2 Normally a student should complete all the requirements consecutively in 8 semesters (4 academic years) for the award of B.Tech. degree. However, the students who fail to fulfill all the requirements for the award of B.Tech. degree within a period of 16 consecutive semesters (8 academic years from the registration in 1st semester) shall forfeit his / her enrolment to the program.
- 17.3 The students admitted in the lateral entry scheme should complete all the requirements consecutively in 6 semesters (3 academic years) for award of B.Tech. degree. However, the students who fail to fulfill all the requirements for the award of B.Tech. degree within a period of 12 consecutive semesters (6 academic years from the registration in 3rd semester) shall forfeit his / her enrolment to the program.
- 17.4 a) **CGPA to Percentage conversion:** As per UGC and AICTE guidelines, the CGPA will be converted to percentage of marks as below:

$$\text{Percentage of marks} = (\text{CGPA} - 0.50) \times 10$$
 Ex: If CGPA is 6.75, the equivalent Percentage of marks = $(6.75 - 0.50) \times 10 = 62.5\%$
- b) CGPA to Class conversion:

S. No.	Division	Eligibility Criteria
1	First Division with Distinction	a) Student should secure $\text{CGPA} \geq 8.0$ b) Student should pass all the courses along with the batch of students admitted with him / her within 8 consecutive semesters (6 consecutive semesters for lateral entry students) c) Student who appeared for improvement examination upto 6 th semester will also be considered d) Student who have cleared any course in supplementary examination shall not be awarded Distinction
2	First Division	a) Student should secure CGPA, which is $6.50 \leq \text{CGPA} < 8.0$ within the time frame of the programme i.e. 16 semesters (12 semesters in case of lateral entry students) b) Student who have cleared any course in supplementary examination and secured $\text{CGPA} \geq 6.50$
3	Second Division	Student should secure CGPA, which is $5.50 \leq \text{CGPA} < 6.50$ within the time frame of the programme i.e. 16 semesters (12 semesters in case of lateral entry students)
4.	Pass Division	Student should secure CGPA, which is $4.0 \leq \text{CGPA} < 5.50$ within the time frame of the programme i.e. 16 semesters (12 semesters in case of lateral entry students)
5.	Fail	Student with $\text{CGPA} < 4.0$ will not be eligible for award of degree

- 17.5 **Honours / Minor in Engineering can be conferred as per AICTE guidelines and Model curriculum January 2018**

A student will be conferred with Under Graduate degree as “Bachelor of Technology in XXX Engineering/Technology, with Honours” (or) “Bachelor of Technology in XXX Engineering/Technology, with Minor in YYY Engineering/Technology”, if he/she completes an additional 20 credits. These additional 20 credits could be acquired through SWAYAM-NPTEL MOOCs / other MOOCs such as Coursera, Udemy, IITB spoken tutorials. These additional 20 credits earned through SWAYAM-NPTEL MOOCs / other MOOCs should be in addition to the credits acquired through SWAYAM - MOOCs offered in the curriculum as part of Professional Electives/ Open Electives. The University will award degrees to the students who are evaluated and recommended by the Institute.

- 17.5.1 **Honours:** Honours is an additional credential a student may earn, if he/she does additional learning for 20 credits in his/her own discipline of B.Tech programme. These additional credits shall be acquired through MOOCs from the list of courses for Honours, prescribed by the respective departments. These courses shall mostly be advanced courses (or) courses designed to give more exposure to different areas of one's own discipline. On

- successful accumulation of these additional credits, at the time of graduation, it shall be mentioned in the degree certificate as *"Bachelor of Technology in XXX Engineering / Technology, with Honours"*.
- 17.5.2 **Minor in Engineering:** A minor in engineering is an additional credential a student may earn, if he/she does additional learning for 20 credits in a discipline other than his/her major discipline of B.Tech programme. These additional credits shall be acquired through MOOCs from the list of courses for a Minor Engineering prescribed by the respective departments. On successful accumulation of these additional credits, at the time of graduation, it shall be mentioned in the degree certificate as *"Bachelor of Technology in XXX Engineering / Technology, with Minor in YYY Engineering/Technology"*.
- 17.5.3 A student shall be eligible to register for a Honours in the same discipline of his/her study, and/or a Minor in Engineering offered by other department.
- 17.5.4 A student can register for both Honours in the same discipline and also a Minor in Engineering in other discipline. On successful accumulation of prescribed credits for Honours and also prescribed credits for Minor in Engineering, at the time of graduation, it shall be mentioned in the degree certificate as *"Bachelor of Technology in XXX Engineering / Technology, with Honours and Minor in YYY Engineering/Technology"*.
- 17.5.5 Student who has completed B.Tech. IV semester in his/ her regular B.Tech. programme without any standing backlogs and with a minimum CGPA of 8.0 shall be allowed to register for Honours and/or Minor in Engineering.
- 17.5.6 Student who wants to register for Honours and/or Minor in Engineering shall opt for registration at the end of IV semester of his/ her B.Tech. programme, subject to the conditions prescribed by the AAC from time to time.
- 17.5.7 Student registered for Honours and/or Minor in Engineering shall ensure the following in his/her regular B.Tech programme
- student should maintain a minimum SGPA of 7.0 from V semester to VIII semester of regular B.Tech programme and
 - student should maintain a CGPA of 8.0 at the end of VIII semester of regular B.Tech programme
- If the student fails to meet the above criteria, his/her registration for Honours and/or Minor in Engineering shall stand cancelled and he/she will be awarded only regular B.Tech degree.
- 17.5.8 A student may withdraw from Honours/Minor in Engineering at any time before graduating. Such students shall submit an application for withdrawal to the Dean AA, before start of any semester. The Dean AA, shall communicate the list of such students to the HoDs concerned (parent-department / minor-department) with a copy to the CoE.
- 17.5.9 During the curriculum revision, the HoDs in coordination with their Department Academic Advisory Committee (DAAC) shall identify the list of courses to be offered by the department under Honours curricula/ Minor in Engineering curricula and forward the same to the office of the Dean AA.
- 17.5.10 Student shall be permitted to take a maximum of 2 theory courses and one laboratory course during any semester for additional learning towards Honours curricula/ Minor in Engineering curricula.
- 17.5.11 Student shall take laboratory courses, listed under Honours curricula/Minor in Engineering curricula, in the parent-department/minor-department during inter-semester break and complete the course with a course project.
- 17.5.12 Office of the Dean AA shall compile and release list of courses under Honours curricula/ Minor in Engineering curricula for different departments/ programmes/disciplines, highlighting the importance of each discipline.
- 17.5.13 By the end of April of every academic year, the Dean AA in coordination with HoDs shall notify the department wise list of equivalent courses in MOOCs/ SWAYAM-NPTEL MOOCs against the list of courses notified under Honours curricula/ Minor in Engineering curricula, by respective departments.

- 17.5.14 Office of the Dean AA shall release registration notification for Honours/ Minor in Engineering, during even semester of every academic year inviting interested students of B.Tech IV semester to apply.
- 17.5.15 Interested students shall submit three (03) copies of applications in the prescribed format, notified by the Dean AA, along with supporting documents to the concerned HoD in the parent-department. The HoD in coordination with DAAC shall scrutinize the submitted applications and forward the consolidated list of registered students along with two sets of applications to the Dean AA.
- 17.5.16 The Dean AA shall notify, in coordination with the CoE, the list of eligible students towards **Honours** and forward this list to the **parent-department**. These notified students shall be allowed to do additional learning towards Honours in Engineering from V semester onwards.
- 17.5.17 The Dean AA shall notify, in coordination with the CoE, the list of eligible students towards Minor in Engineering and forward this list to the minor-department in which student opted to gain prescribed credits for Minor in Engineering along with one set of application. These notified students shall be allowed to do additional learning towards Minor in Engineering from V semester onwards.
- 17.5.18 In the process of additional learning towards Honours/ Minor in Engineering, the student shall exercise carefully all options to ensure the following:
 - (i) The credits earned in a course studied in regular curriculum towards fulfilment of basic degree, shall not be claimed under credits for additional learning towards Honours/ Minor in Engineering and vice versa
 - (ii) A course once studied in regular curriculum, shall not be taken again for additional learning towards Honours/ Minor in Engineering
- 17.5.19 The HoD in coordination with department MOOCs coordinator and faculty counsellor concerned, shall monitor progress of the registered student during the semester for successful completion of registered courses of Honours curricula.
- 17.5.20 The minor-department HoD in coordination with minor-department MOOCs coordinator and faculty counsellor concerned, shall monitor progress of the registered student during the semester for successful completion of registered courses of Minor in Engineering curricula.
- 17.5.21 On successful completion of registered courses, the student shall submit the course completion details in "Semester wise progress report (*for additional learning towards Honours/Minor in Engineering*)" in the prescribed format notified by the Dean, AA along with Certificate/ Grade sheet/ Mark sheet (indicating credits of the course) to the HoDs concerned (parent-department /minor-department).
- 17.5.22 The HoDs shall consolidate "Semester wise progress report (*for additional learning towards Honours/Minor in Engineering*)" of all the students registered for *Honours/Minor in Engineering* in their departments and forward the same to the Dean AA.
- 17.5.23 The Dean AA shall ensure genuineness of the submitted certificates, of registered students, with the help of the Institute MOOCs coordinator and forward the semester wise progress of registered students to the CoE.
- 17.5.24 The CoE shall ensure for reflecting the earned credits for additional learning towards Honours/Minor in Engineering in corresponding student semester grade sheet, subsequently in consolidated grade sheet and transcripts.
- 17.5.25 Separate CGPA for Honours and/or Minor in Engineering shall be mentioned in the consolidated grade sheet.
- 17.5.26 The students who have registered for Honours/ Minor in Engineering but unable to accumulate the 20 credits prescribed towards Honours/ Minor in Engineering at the time of graduation, he/she shall be awarded the Degree in his/her discipline without any mention about Honours/ Minor in Engineering.
- 17.6 The University will award degrees to the students who are evaluated and recommended by the Institute.

18. MALPRACTICE IN EXAMINATION

- 18.1 Malpractice in examination is an illegal activity and is prohibited.
- 18.2 Mobile phones are strictly prohibited in the examination hall.

- 18.3 Exchange of question paper and material like pen, pencil, sharpener, eraser, scale, calculator, etc., during examination is strictly prohibited.
- 18.4 Malpractice in examination is viewed very seriously. Malpractice includes oral communication between candidates, possessing forbidden material, mobile phones (switched off/on) etc.
- 18.5 Any malpractice or engaging in any improper conduct and violation of the examination code by the student during examinations is liable for the punishment as given below:

S. No	Nature of Malpractice	S. No	Punishment
1.	Taking help from others, consulting and or helping other examinees during the examination period inside the examination hall or outside it, with or without their consent or helping other candidates to receive help from anyone else	a)	Cancelling the examination of the paper in which he / she indulged in malpractices
2	If the examinee attempts to disclose his / her identity to the valuer by writing his / her Hall-Ticket Number at a place other than the place prescribed for it or any coded message including his / her name or addressing the valuer in any manner in the answer book		Cancelling the examination of the paper in which he / she indulged in malpractices
3.	Candidate is found in possession of forbidden material; relevant or not relevant <u>but not used</u>	b)	Cancellation of the result of (i) all examinations taken including current examination in that session (or) (ii) current examination and proposed examinations to be taken during that session (or) (iii) current examination
4.	Destroying the material found in his / her possession or acting in any other manner with a view to destroying evidence	c)	Cancellation of the result of all examinations taken or proposed to be taken during that session and prohibiting his/her admission to or continuation in any course of the Institute for a period of one year. The student will be eligible to appear for the next corresponding semester / year examination in the succeeding academic year
5.	Smuggling main answer book / additional answer book / question paper / matter in to or out of the examination hall & Conspiring to interchange Hall Ticket Numbers		-do-
6.	Candidate is found in possession of forbidden material, relevant or not relevant <u>but used</u>		-do-
7.	In case of (i) impersonation, (ii) misbehavior with the invigilators/any person related to examination work, (iii) insertion of written sheets in different hand writing in the main/additional answer book, and (iv) creation of disturbance in and around the examination hall during or before the examination	d)	Cancellation of the result of all examinations taken or proposed to be taken during that session and prohibiting his/her admission in to or continuation in any course of the Institute for a period of two years. Further, the candidate shall not be allowed to appear for any examination during the period of punishment
8.	If a candidate is found guilty of malpractice in the improvement examination (after completion of course)	e)	Punishment will be awarded subject to the above rules and further, he/she will not be permitted to appear for further improvement examination

19. ROLL NUMBER ALLOTMENT

The Roll Number given to the student shall have a total 8 digits as follows:

Ex: **B18CE108**

- a) The first letter, to represent Bachelors (B.Tech.) degree programme.
Ex: B for **B**.Tech. programme
- b) The next two numbers, to represent the year in which the student admitted into I semester.
Ex: 18 for **2018**
- c) The next two letters, to represent the concerned department to which the student belongs.
Ex: CE for **Civil Engineering**
- d) The last three numbers, to represent the three - digit roll number of the student.

In general, a **student with roll number "B18CE108"** represents a **B.Tech.** student admitted in **2018** in **Civil Engineering** bearing a roll number **108**.

20. AMENDMENTS

Notwithstanding anything contained in this manual, the Academic Council of the Institute reserves the right to modify / amend the curricula, requirements and rules & regulations pertaining to its undergraduate programmes, without any further notice.