

# KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

(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)

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

కాకతీయ ప్రేఘోగికీ ంవ్ విజ్ఞాన సంస్థాన, వరంగల్ - 506 015

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - 506 015

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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 MECHANICAL ENGINEERING

### VISION OF THE DEPARTMENT

*To be a centre of excellence in Mechanical Engineering, to provide the best teaching-learning and research environment, to produce high quality professionals and entrepreneurs to cater the needs of society.*

### MISSION OF THE DEPARTMENT

- *To impart quality education that builds strong ethical attitude, technical knowledge and professional skills by providing congenial teaching-learning environment.*
- *To nurture the reasoning, problem solving and research capabilities of learners by providing the state-of-the-art facilities, to meet the changing needs of society.*
- *To inculcate life-long learning and leadership traits for successful professional careers, by counseling and mentoring.*

## PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO		Within first few years after graduation, the MECHANICAL ENGINEERING graduates will be able to ...
PEO1	<i>Technical Expertise (Capability)</i>	apply a broad understanding of mechanical engineering, as well as concepts from mathematics, science, communication and computing, to solve specific problems in industry and associated engineering fields.
PEO2	<i>Successful Career (Distinctiveness)</i>	demonstrate distinctiveness, professional ethics, integrity and innovation in their chosen profession and work well as individuals and in teams to achieve sustainable development in diverse fields.
PEO3	<i>Lifelong learning (Leadership)</i>	adapt to a constantly changing field by pursuing higher education, professional development, and self-study in order to contribute to society's well-being.

<b>PROGRAM OUTCOMES (POs) &amp; PROGRAM SPECIFIC OUTCOMES (PSOs)</b>	
<b>UG - MECHANICAL ENGINEERING - ME</b>	
<b>PROGRAM OUTCOMES (POs)</b>	<b>At the time of graduation, the MECHANICAL ENGINEERING graduates will be able to ...</b>
<b>PO1: Engineering knowledge</b>	<i>apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems</i>
<b>PO2: Problem analysis</b>	<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>
<b>PO3: Design/development of solutions</b>	<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>
<b>PO4: Conduct investigations of complex problems</b>	<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>
<b>PO5: Modern tool usage</b>	<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>
<b>PO6: The engineer and society</b>	<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>
<b>PO7: Environment and sustainability</b>	<i>understand the impact of the professional engineering solutions in societal and environmental contexts, demonstrate the knowledge of, and need for sustainable development</i>
<b>PO8: Ethics</b>	<i>apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice</i>
<b>PO9: Individual and team work</b>	<i>function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings</i>
<b>PO10: Communication</b>	<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>
<b>PO11: Project management and finance</b>	<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>
<b>PO12: Life-long learning</b>	<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>
<b>PROGRAM SPECIFIC OUTCOMES (PSOs):</b>	
<b>PSO1</b>	<i>apply learned principles and knowledge in various applications of materials, design, thermal, production and industrial engineering.</i>
<b>PSO2</b>	<i>model, analyze, design, develop and implement advanced mechanical systems or processes.</i>



**DEPARTMENT OF MECHANICAL ENGINEERING**  
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URR-18R22

**SCHEME OF INSTRUCTION AND EVALUATION**  
**I-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

**[5Th+4P+2MC]**

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
				L	T	P		C	CIE			ESE
							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 Lab	-	-	2	1	40	-	40	60	100
7	ESC	U18CS107	Programming for Problem Solving using C Lab	-	-	2	1	40	-	40	60	100
8	BSC	U18PH108	Engineering Physics Lab	-	-	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 Values-I ( <i>Induction Programme</i> )	-	-	-	-	-	-	-	-	-
<b>Total:</b>				<b>14</b>	<b>3</b>	<b>12</b>	<b>22</b>	<b>280</b>	<b>180</b>	<b>460</b>	<b>540</b>	<b>1000</b>

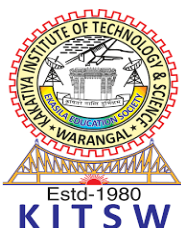
**L= Lecture, T = Tutorials, P = Practicals & C = Credits**

**EAA: Extra Academic Activity**

**\* indicates mandatory non-credit course**

**Contact hours per week : 29**

**Total Credits : 22**



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**SCHEME OF INSTRUCTION AND EVALUATION**  
**II-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

**[5Th+2P+2MC]**

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
				L	T	P		C	CIE			ESE
							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	U18CS207R1	Data Structures through C Lab	-	-	2	1	40	-	40	60	100
7	BSC	U18CH208	Engineering Chemistry Lab	-	-	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
<b>Total:</b>				<b>16</b>	<b>3</b>	<b>10</b>	<b>21</b>	<b>270</b>	<b>150</b>	<b>420</b>	<b>480</b>	<b>900</b>

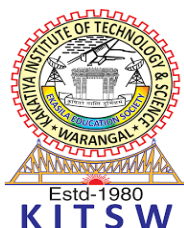
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**EAA: Extra Academic Activity**

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**Contact hours per week : 29**

**Total Credits : 21**



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**SCHEME OF INSTRUCTION AND EVALUATION**  
**III-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

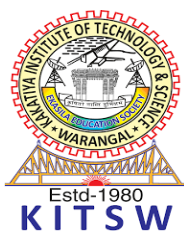
[6Th+3P+1MC]

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
				L	T	P		C	CIE			ESE
							TA		MSE	Total		
1	BSC	U18MH301	Engineering Mathematics - III	3	1	-	4	10	30	40	60	100
2	HSMC	U18MH302	Professional English	-	-	2	1	10	30	40	60	100
3	ESC	U18ME303	Mechanics of Solids	3	-	-	3	10	30	40	60	100
4	PCC	U18ME304	Material Science and Metallurgy	3	-	-	3	10	30	40	60	100
5	PCC	U18ME305	Engineering Thermodynamics	3	1	-	4	10	30	40	60	100
6	PCC	U18ME306	Machine Drawing	2	-	4	4	10	30	40	60	100
7	PCC	U18ME307	Material Science and Metallurgy Lab	-	-	2	1	40	-	40	60	100
8	ESC	U18ME308	Mechanics of Solids Lab	-	-	2	1	40	-	40	60	100
9	PCC	U18ME309	Modeling Lab	-	-	2	1	40	-	40	60	100
10	MC	U18MH315	Essence of Indian Traditional Knowledge	2	-	-	-	10	30	40	60	100
<b>Total:</b>				<b>14</b>	<b>2</b>	<b>12</b>	<b>22</b>	<b>190</b>	<b>210</b>	<b>400</b>	<b>600</b>	<b>1000</b>

**L= Lecture, T = Tutorials, P = Practicals & C = Credits**

**Contact hours per week : 28**

**Total Credits : 22**



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**SCHEME OF INSTRUCTION AND EVALUATION**  
**IV-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

[7Th+2P+1MC]

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
								CIE			ESE	Total Marks
				L	T	P	C	TA	MSE	Total		
1	BSC	U18OE401	Open Elective-II	3	1	-	4	10	30	40	60	100
2	HSMC	U18TP402	Soft and Inter Personal Skills	-	-	2	1	100	-	100	-	100
3	PCC	U18OE403	Open Elective-I	3	-	-	3	10	30	40	60	100
4	PCC	U18ME404	Design of Machine Elements	3	-	-	3	10	30	40	60	100
5	PCC	U18ME405	Kinematics of Machinery	3	1	-	4	10	30	40	60	100
6	PCC	U18ME406	Manufacturing Processes	3	-	-	3	10	30	40	60	100
7	PCC	U18ME407	Applied Thermodynamics	3	-	-	3	10	30	40	60	100
8	PCC	U18ME408	Manufacturing Processes Lab	-	-	2	1	40	-	40	60	100
9	PCC	U18OE411	Open Elective-I based Lab	-	-	2	1	40	-	40	60	100
10	MC	U18CH416	Environmental Studies*	2	-	-	-	10	30	40	60	100
<b>Total:</b>				<b>18/20*</b>	<b>2</b>	<b>6</b>	<b>23</b>	<b>240/250*</b>	<b>180/210*</b>	<b>420/460*</b>	<b>480/540*</b>	<b>900/1000*</b>

**L= Lecture, T = Tutorials, P = Practicals & C = Credits**

**\* indicates mandatory non-credit course for Lateral Entry Students only**

**Contact hours per week : 26/28\***

**Total Credits : 23**

<p><b>Open Elective-I:</b>          U18OE403A: Object Oriented Programming (CSE)          U18OE403B: Fluid Mechanics &amp; Hydraulic Machines (CE)          U18OE403D: Web Programming (IT)          U18OE403E: Microprocessors (ECE)          U18OE403F: Strength of Materials (CE)</p>	<p><b>Open Elective-II:</b>          U18OE401A: Applicable Mathematics (MH)          U18OE401B: Basic Electronics Engineering (ECE)          U18OE401D: Measurements &amp; Instrumentation (EIE)          U18OE401E: Fundamentals of Computer Networks (IT)          U18OE401F: Renewable Energy Sources (EEE)</p>	<p><b>Open Elective-I based Lab:</b>          U18OE411A: Object Oriented Programming Lab (CSE)          U18OE411B: Fluid Mechanics &amp; Hydraulic Machines Lab (CE)          U18OE411D: Web Programming Lab (IT)          U18OE411E: Microprocessors Lab (ECE)          U18OE411F: Strength of Materials Lab(CE)</p>
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URR-18R22

**SCHEME OF INSTRUCTION AND EVALUATION**  
**V-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

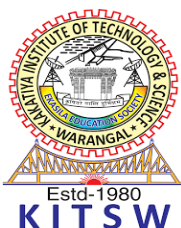
**[6Th+3P+1Seminar]**

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
				L	T	P		C	CIE			ESE
							TA		MSE	Total		
1	HSMC	U18TP501	Quantitative Aptitude & Logical Reasoning	2	-	-	1	10	30	40	60	100
2	PE	U18ME502	Professional Elective - I / MOOC-I	3	-	-	3	10	30	40	60	100
3	PCC	U18ME503	Dynamics of Machinery	3	-	-	3	10	30	40	60	100
4	PCC	U18ME504	Machine Tools and Metrology	3	-	-	3	10	30	40	60	100
5	PCC	U18ME505R22	IC Engines and Gas Turbines	3	-	-	3	10	30	40	60	100
6	ESC	U18IT511	Object Oriented Programming through JAVA	3	-	-	3	10	30	40	60	100
7	PCC	U18ME506R22	Internal Combustion Engines & Dynamics of Machinery Lab	-	-	2	1	40	-	40	60	100
8	PCC	U18ME507	Production Engineering Lab-I	-	-	2	1	40	-	40	60	100
9	ESC	U18IT512	JAVA Programming Lab	-	-	2	1	40	-	40	60	100
10	PROJ	U18ME508	Seminar	-	-	2	1	100	-	100	-	100
<b>Total:</b>				<b>17</b>	<b>-</b>	<b>8</b>	<b>20</b>	<b>280</b>	<b>180</b>	<b>460</b>	<b>540</b>	<b>1000</b>
<b>Additional Learning*:</b>		<i>Maximum credits allowed for Honours/Minor</i>		-	-	-	7	-	-	-	-	-
<b>Total credits for Honours/Minor students:</b>				-	-	-	<b>20+7</b>	-	-	-	-	-

\* 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; Contact hours per week: 25**

**Professional Elective-I/ MOOC-I:**  
 U18ME502A: Design of Transmission Systems  
 U18ME502B: Robotics  
 U18ME502C: Computer Aided Design  
 U18ME502M: MOOCs Course



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**SCHEME OF INSTRUCTION AND EVALUATION**  
**VI-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

**[5Th+3P+1MC+1Mini Project]**

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
				L	T	P		C	CIE			ESE
							TA		MSE	Total		
1	MC	U18MH601	Universal Human Values-II	2	-	-	-	10	30	40	60	100
2	OE	U18OE602	Open Elective - III	3	-	-	3	10	30	40	60	100
3	PE	U18ME603	Professional Elective - II / MOOC-II-	3	-	-	3	10	30	40	60	100
4	PCC	U18ME604	Heat Transfer	3	-	-	3	10	30	40	60	100
5	PCC	U18CS611	Advanced Data Structures	3	-	-	3	10	30	40	60	100
6	PCC	U18ME606	Theory of Metal Cutting	3	-	-	3	10	30	40	60	100
7	PCC	U18ME607	Heat Transfer Lab	-	-	2	1	40	-	40	60	100
8	PCC	U18ME608	Computer Aided Analysis Lab	-	-	2	1	40	-	40	60	100
9	PCC	U18CS612	Advanced Data Structures Lab	-	-	2	1	40	-	40	60	100
10	PROJ	U18ME610	Mini Project	-	-	2	1	100	-	100	-	100
<b>Total:</b>				<b>17</b>	<b>1</b>	<b>8</b>	<b>19</b>	<b>280</b>	<b>180</b>	<b>460</b>	<b>540</b>	<b>1000</b>
<i>Additional Learning*:</i>				<i>Maximum credits allowed for Honours/Minor</i>			-	-	-	-	-	-
				<i>Total credits for Honours/Minor students:</i>			-	-	-	-	-	-

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<b>Professional Elective-II/ MOOC-II:</b> U18ME603A: Finite Element Methods U18ME603B: Mechanical Vibrations & Condition monitoring U18ME603C: Composite Materials U18ME603M: MOOCs course	<b>Open Elective-III:</b> U18OE602A: Disaster Management U18OE602B: Project Management U18OE602C: Professional Ethics in Engineering U18OE602D: Rural Technology and Community Development
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**SCHEME OF INSTRUCTION AND EVALUATION**  
**VII-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

**[4Th+2P+1MC+1Major Project]**

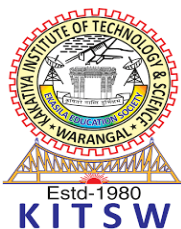
Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme				
				L	T	P		C	CIE			ESE
							TA		MSE	Total		
1	HSMC	U18MH701	Management Economics & Accountancy	3	-	-	3	10	30	40	60	100
2	PE	U18ME702	Professional Elective - III / MOOC-III	3	-	-	3	10	30	40	60	100
3	PE	U18ME703	Professional Elective - IV / MOOC-IV	3	-	-	3	10	30	40	60	100
4	PCC	U18ME704	Refrigeration & Air Conditioning	3	-	-	3	10	30	40	60	100
5	PCC	U18ME705	Thermal Engineering Lab	-	-	2	1	40	-	40	60	100
6	PCC	U18ME706	Production Engineering Lab-II	-	-	2	1	40	-	40	60	100
7	PROJ	U18ME707	Major Project - Phase - I	-	-	6	3	100	-	100	-	100
8	MC	U18ME708	Internship Evaluation	-	-	2	-	100	-	100	-	100
<b>Total:</b>				<b>12</b>	<b>-</b>	<b>12</b>	<b>17</b>	<b>320</b>	<b>120</b>	<b>440</b>	<b>360</b>	<b>800</b>
<b>Additional Learning*:</b>				<i>Maximum credits allowed for Honours/Minor</i>			-	-	-	-	-	-
				<b>Total credits for Honours/Minor students:</b>			<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

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

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**Contact hours per week: 24**

<b>Professional Elective-III / MOOC-III:</b> U18ME702AR22: Production and Operations Management U18ME702B: Design of Thermal Equipments U18ME702C: Energy Audit and Management U18ME702M: MOOCs course	<b>Professional Elective-IV / MOOC-IV</b> U18ME703A: Computer Integrated Manufacturing U18ME703B: Modern Machining Processes U18ME703C: Industry 4.0 U18ME703M: MOOCs course
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**SCHEME OF INSTRUCTION AND EVALUATION**  
**VIII-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**

**[3Th+1Major Project]**

Sl. No	Category	Course Code	Course Title	Hours per week			Credits	Evaluation Scheme					
				L	T	P		C	CIE			ESE	Total Marks
									TA	MSE	Total		
1	PE	U18ME801	Professional Elective - V / MOOC-V	3	-	-	3	10	30	40	60	100	
2	PE	U18ME802	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	U18ME804	Major Project - Phase - II	-	-	14	7	60	-	60	40	100	
<b>Total:</b>				<b>9</b>	<b>-</b>	<b>14</b>	<b>16</b>	<b>90</b>	<b>90</b>	<b>180</b>	<b>220</b>	<b>400</b>	
<i>Additional Learning*:</i>			<i>Maximum credits allowed for Honours/Minor</i>	-	-	-	7	-	-	-	-	-	
<i>Total credits for Honours/Minor students:</i>				-	-	-	<b>16+7</b>	-	-	-	-	-	

\* 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      Contact hours per week      : 23**

<b>Professional Elective-V / MOOC-V:</b> U18ME801A: Power Plant Engineering U18ME801B: Total Quality Management U18ME801CR22: Renewable Energy Sources U18ME801M: MOOCs course	<b>Professional Elective-VI/ MOOC-VI:</b> U18ME802A: Additive Manufacturing U18ME802B: Automobile Engineering U18ME802C: Computational Fluid Dynamics U18ME802M: MOOCs course	<b>Open Elective-IV/MOOC-VII:</b> U18OE803A: Operations Research U18OE803B: Management Information Systems U18OE803C: Entrepreneurship Development U18OE803D: Forex and Foreign Trade U18OE803M: MOOCs course
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**DEPARTMENT OF MECHANICAL ENGINEERING**  
**KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL - 15**  
*(An Autonomous Institute under Kakatiya University, Warangal)*

**SCHEME OF INSTRUCTION AND EVALUATION**  
**I-VIII-SEMESTER OF 4-YEAR B.TECH DEGREE PROGRAMME**  
**Semester Vs Course Category Weightage**  
*(In terms of Total No. of Courses / Total No. of Credits)*

Semester	No. of Courses / No. of Credits (course category wise)									
	BSC	ESC	HSMC	PCC	PE	OE	MC	PROJ	B. Tech Programme Total	B. Tech (Honours/Minor) Programme
I	3/9	5/10	1/3	-	-	-	2/0	-	11/22	<i>Additional 20 credits through 8 courses out of the list of courses prescribed under Honours/Minor curricula</i>
II	3/9	4/12	-	-	-	-	2/0	-	9/21	
III	1/4	2/4	1/1	5/13	-	-	1/0	-	10/22	
IV	1/4	-	1/1	7/18	-	-	1/0	-	10/23	
V	-	2/4	1/1	5/11	1/3	-	-	1/1	10/20	
VI	-	-	-	6/12	1/3	1/3	1/0	1/1	10/19	
VII	-	-	1/3	3/5	2/6	-	1/0	1/3	8/17	
VIII	-	-	-	-	2/6	1/3	-	1/7	4/16	
<b>Total:</b>	8/26	13/30	5/9	26/59	6/18	2/6	8/0	4/12	72/160	(72+8) / (160+20)
<b>% Weightage of course category</b>	16.25% (26/160)	18.75% (30/160)	5.6% (9/160)	36.88% (59/160)	11.25% (18/160)	3.75% (6/160)	0% (0/160)	7.5% (12/160)	100% (160/160)	-