

B.TECH. CURRICULUM

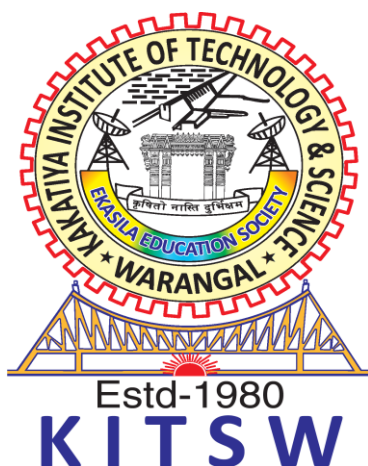
ACADEMIC YEAR: 2026-27

DEPARTMENT OF MECHANICAL ENGINEERING (ME)

Undergraduate Rules and Regulations-2026 (URR26)

**In accordance with the National Education Policy 2020
w.e.f AY 2026-27**

**Regulations Governing the
Choice Based Credit System and
Multiple Entry and Multiple Exit Options
with
Competency-Focused Outcome Based Curriculum (CF-OBC)**



DEPARTMENT OF MECHANICAL ENGINEERING
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL – 506 015 TELANGANA
(UGC Autonomous Institute Under Kakatiya University, Warangal)

B. Tech (ME) –CURRICULUM (KITSW-URR26)

SEMESTER-WISE CURRICULUM WITH SCHEME OF INSTRUCTIONS

Abbreviations

L	Lecture Hour	E	Total Engagement in Hours
T	Tutorial Hour	C	Credit Assigned
P	Practical Hour		

I SEMESTER (Stream – II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
-	IKSC	U26IK100	AICTE Mandated Student Induction Programme (Universal Human Values - I)					-
1	BSC	U26MH101	Differential Calculus and Ordinary Differential Equations	2	1	-	3	3
2	BSC	U26CY102B	Engineering Chemistry	2	1	-	3	3
3	ESC	U26ME103	Programming for Problem Solving with C	2	1	-	3	3
4	HSMC	U26MH104	English Communication and Report Writing	2	1	-	3	3
5	PCC	U26ME105	Engineering Mechanics	2	1	-	3	3
6	BSC	U26CY106B	Engineering Chemistry Laboratory	-	-	2	2	1
7	ESC	U26ME107	Programming for Problem Solving with C Laboratory	-	-	2	2	1
8	VAC	U26VA108	Sports & Yoga	-	-	2	2	1
9	ESC	U26ME109	Engg. Graphics & CAD*	1	-	4	5	3
			Total:	11	5	10	26	21
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

S. No.	Course Code	Course Title		S. No.	Course Code	Course Title
Pool – V				Pool – VI		
1.	U26CY102A	Engineering Chemistry (for CE)		1.	U26CY106A	Engineering Chemistry Laboratory (for CE)
2.	U26CY102B	Engineering Chemistry (for ME)		2.	U26CY106B	Engineering Chemistry Laboratory (for ME)
3.	U26CY102C	Engineering Chemistry (for EEE/ECE/ECI)		3.	U26CY106C	Engineering Chemistry Laboratory (for EEE/ECE/ECI)
4.	U26CY102D	Engineering Chemistry (for CS/IT)		4.	U26CY106D	Engineering Chemistry Laboratory (for CS/IT)

II SEMESTER (Stream - II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	
1	BSC	U26MH201	Matrix Theory and Vector Calculus	2	1	-	3	3
2	BSC	U26PY202B	Engineering Physics	2	1	-	3	3
3	ESC	U26ME203	Data Structures through C	2	1	-	3	3
4	ESC	U26EE204A	Basic Electrical & Electronics Engineering	2	1	-	3	3
5	PCC	U26ME205	Thermodynamics	2	1	-	3	3
6	BSC	U26PY206B	Engineering Physics Laboratory	-	-	2	2	1
7	ESC	U26ME207	Data Structures Through C Laboratory	-	-	2	2	1
8	ESC	U26EE208A	Basic Electrical & Electronics Engineering Laboratory	-	-	2	2	1
9	AEC	U26AE210	IDEA Lab Makerspace	-	-	2	2	1
			Total:	10	5	8	25	19
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)								

S. No.	Course Code	Course Title		S. No.	Course Code	Course Title
Pool - IX				Pool - XI		
1.	U26PY202A	Engineering Physics (for CE)		1.	U26PY206A	Engineering Physics Laboratory (for CE)
2.	U26PY202B	Engineering Physics (for ME)		2.	U26PY206B	Engineering Physics Laboratory (for ME)
3.	U26PY202C	Engineering Physics (for EEE/ECE/ECI)		3.	U26PY206C	Engineering Physics Laboratory (for EEE/ECE/ECI)
4.	U26PY202D	Engineering Physics (for CS/IT)		4.	U26PY206D	Engineering Physics Laboratory (for CS/IT)

Pool - X				Pool - XII		
1.	UU26EE204A	Basic Electrical & Electronics Engineering (for CE/ME)		1.	UU26EE208A	Basic Electrical & Electronics Engineering Laboratory (for CE/ME)
2.	UU26EE204B	Basic Electrical Engineering (for ECE/ECI)		2.	UU26EE208B	Basic Electrical Engineering Laboratory (for ECE/ECI)
3.	UU26EE204C	Basic Electrical Engineering (for EEE)		3.	UU26EE208C	Basic Electrical Engineering Laboratory (for EEE)
4.	UU26EE204D	Basic Electrical Engineering (for CS/IT)		4.	UU26EE208D	Basic Electrical Engineering Laboratory (for CS/IT)

Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute
OR
Successful completion of two suitable skill based courses (external) to qualify for Certification

A. After First Year: (UG Certificate in ME)

(i) The candidate should pass any two of the following additional courses (ITI Level) during the 2-Months internship at institute

Exit Option to Qualify UG Certificate in ME: Any Two (02) Courses during the 2 - Months internship									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	PCC	U26ME212X	Performance of IC Engines	2	-	2	-	4	3
2	PCC	U26ME213X	Machine Drawing & Modelling	2	-	2	-	4	3
3	PCC	U26ME214X	Basic Mechanical Engineering	2	-	2	-	4	3
4	PCC	U26ME215X	Any other course approved by BoS Chair and Dean AA	2	-	2	-	4	3

(OR)

(ii) Any two suitable skill based courses to qualify for Certification.

Exit Option to Qualify UG Certificate in ME: Any Two (02) Skill based Courses :-									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	SEC	U26SE212X	Certificate course in Product Design and Development (Offered by MSME CITD)	-	-	6	-	6	3
2	SEC	U26SE213X	Foundry men (NSQF)	-	-	6	-	6	3
3	SEC	U26SE214X	Mechanic Diesel (NSQF)	-	-	6	-	6	3
4	SEC	U26SE215X	Certificate Course in Product Design and Manufacturing (CITD)	-	-	6	-	6	3
5	SEC	U26SE216X	Any other skill based course approved by BoS Chair and Dean AA	-	-	6	-	6	3

III SEMESTER (STREAM -II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	
1	BSC	U26MH301B	Applied Mathematics	2	1	-	3	3
2	PCC	U26ME302	Material Science & Metallurgy	2	1	-	3	3
3	PCC	U26ME303	Mechanics of Materials	2	1	-	3	3
4	ESC	U26ME304	Python Programming	2	1	-	3	3
5	PCC	U26ME305	Fluid Mechanics and Hydraulic Machines	2	1	-	3	3
6	PCC	U26ME306	Manufacturing Processes	2	1	-	3	3
7	ESC	U26ME307	Python Programming Laboratory	-	-	2	2	1
8	PCC	U26ME308	Mechanics of Materials Laboratory	-	-	2	2	1
9	PCC	U26ME309	Production Engineering Laboratory-I	-	-	2	2	1
Total:				12	6	6	24	21
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				"Programming in C" bridge course for Non-CS/IT Lateral Entry students				

Branch Specific Mathematics (Pool - XIII)		
S. No.	Course Code	Course Title
1.	U26MH401A	Numerical and Statistical Methods (<i>for CE</i>)
2.	U26MH401B	Applied Mathematics (<i>for ME</i>)
3.	U26MH401D	Discrete Mathematics and Probability Statistics (<i>for CSN, CSO & IT</i>)
4.	U26MH401E	Essential Mathematics and Statistics for Machine learning (<i>for CSM</i>)
5.	U26MH401F	Essential Mathematics and Statistics for Data science (<i>for CSD</i>)

IV SEMESTER (STREAM -II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	PCC	U26ME401	IC Engines and Gas Turbines	2	1	-	3	3
2	PCC	U26ME402	Machine Drawing	2	-	2	4	3
3	PCC	U26ME403	Design of Machine Elements	2	1	-	3	3
4	PCC	U26ME404	Machine Tools & Metrology	2	1	-	3	3
5	PCC	U26ME405	Artificial Intelligence & Machine Learning	2	1	-	3	3
6	VAC	U26CY406	Environmental Studies	2	-	-	2	1
7	PCC	U26ME407	Thermal Engineering Laboratory	-	-	2	2	1
8	PCC	U26ME408	Machine Tools & Metrology Laboratory	-	-	2	2	1
9	PCC	U26ME409	AIML Applications Laboratory	-	-	2	2	1
10	VAC	U26VA410	Soft & Interpersonal Skills	-	-	2	2	1
Total				12	4	10	26	20
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute
OR
Successful completion of two suitable skill based courses (external) to qualify for Certification

B. After Second Year: (UG Diploma in ME)

(i) The candidate should pass any two of the following additional courses (Diploma Level) during the 2-Months internship at institute

Exit Option to Qualify UG Diploma in ME: Any Two (02) Courses during the 2 - Months internship									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	PCC	U26ME412X	Theory of Machines	2	-	2	-	4	3
2	PCC	U26ME413X	Workshop Technology	2	-	2	-	4	3
3	PCC	U26ME414X	Refrigeration Systems	2	-	2	-	4	3
4	PCC	U26ME415X	Any other course approved by BoS Chair and Dean AA	2	-	2	-	4	3

(OR)

(ii) Any two suitable skill based courses to qualify for Diploma.

Exit Option to Qualify UG Diploma in ME: Any Two (02) Skill based Courses -:									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	SEC	U26SE412X	Certificate Course in Product Design and Analysis (Offered by MSME-CITD)	-	-	6	-	6	3
2	SEC	U26SE413X	Certificate Course in Design Of Plastic Injection Moulds (CITD)	-	-	6	-	6	3
3	SEC	U26SE414X	Certificate Course in Design of Press Tools (CITD)	-	-	6	-	6	3
4	SEC	U26SE415X	Mechanic Motor Vehicle (NSQF)	-	-	6	-	6	3
5	SEC	U26SE416X	Any other skill based course approved by BoS Chair and Dean AA	-	-	6	-	6	3

B. Tech Honours with Research:

- Students opting for B. Tech Honours with Research, shall undergo a 2-Month Mandatory Research Internship-I (5 Credits) at respective department during the summer vacation after IV Semester.

V SEMESTER (STREAM -II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	
1	OE	U26OE501X	Open Elective-Sustainable Development Goals Basket (OE-SDG)	2	1	-	3	3
2	PCC	U26ME502	Applied Thermodynamics	2	1	-	3	3
3	PCC	U26ME503	Kinematics of Machinery	2	1	-	3	3
4	PCC	U26ME504	Machining Science	2	1	-	3	3
5	PCC	U26ME505	Heat Transfer	2	1	-	3	3
6	IKSC	U26IK506B	Essence of Indian Traditional Knowledge	2	-	-	2	2
7	PCC	U26ME507	Heat Transfer Laboratory	-	-	2	2	1
8	PCC	U26ME508	Machining Science Laboratory	-	-	2	2	1
9	PCC	U26ME509	Modelling Laboratory	-	-	2	2	1
10	ELC	U26ME510	Seminar	-	-	2	2	1
Total:				12	5	8	25	21
Additional Learning [@] : Maximum credits allowed for Honours/Minor				-	-		-	5
Total credits for Honours/Minor students:				-		-	-	26
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

Sustainable Development Goals Basket		
Sr. No.	Course Code	Course Title
1.	U26OE501A	Sustainable Waste Management and Circular Economy (Offered by CE Department)
2.	U26OE501B	Carbon Reduction and Net Zero (Offered by EEE Department)
3.	U26OE501F	Intelligent Imaging for Sustainable Engineering (Offered by ECE Department)
4.	U26OE501L	Sensors and Actuators for Sustainable Smart cities and Health care (Offered by ECI Department)
5.	U26OE501T	Object Oriented Programming through Java (Offered by IT Department)

VI SEMESTER (STREAM-II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	
1	OE	U26OE601X	Startups & Entrepreneurship Basket	26	1	-	3	3
2	PCC	U26ME602	Production and Operations Management	2	1	-	3	3
3	PCC	U26ME603	Dynamics of Machinery	2	1	-	3	3
4	PCC	U26ME604	Refrigeration & Air Conditioning	2	1	-	3	3
5	PCC	U26ME605	Finite Element Methods	2	1	-	3	3
6	IKSC	U26IK606A	Universal Human Values - II	2	-	-	2	2
7	HSMC	U26MH607	English Language Laboratory	-	-	2	2	1
8	PCC	U26ME608	Finite Element Methods Laboratory	-	-	2	2	1
9	PCC	U26ME609	RAC & DM Lab	-	-	2	2	1
10	ELC	U26ME610	Mini Project	-	-	2	2	1
Total:				12	5	8	25	21
Additional Learning@:Maximum credits allowed for Honours/Minor				-	-	-	-	5
Total credits for Honours/Minor students:				-	-	-	-	26
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

Startups & Entrepreneurship Basket		
Sr. No.	Course Code	Course Title
1.	U26OE601A	Design Thinking
2.	U26OE601B	Innovative Product Design and Development
3.	U26OE601C	Entrepreneurship
4.	U26OE601D	Design Studio
5.	U26OE601E	Any other course approved by BoS Chair and Dean AA

Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute
OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

C. After Third Year:(B. Voc. in ME)

(i) The candidate should pass any two of the following additional courses (Degree Level) during the 2-Months internship at institute

Exit Option to Qualify B. Voc in ME: Any Two (02) Courses during the 2 - Months internship									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	PCC	U26ME610X	Industrial Robotics	2	-	2	-	4	3
2	PCC	U26ME611X	Computer Integrated Manufacturing	2	-	2	-	4	3
3	PCC	U26ME612X	Power Plant Engineering	2	-	2	-	4	3
4	PCC	U26ME613X	Any other course approved by BoS Chair and Dean AA	2	-	2	-	4	3

(OR)

(ii) Any two suitable skill based courses to qualify for. Voc in ME Degree.

Exit Option to Qualify B. Voc in ME: Any Two (02) Skill based Courses -:									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	SEC	U26SE614X	Certificate Course in Design and Analysis of Mechanical Systems using NX and SIMCENTER (Offered by: Centre of excellence by Digital Manufacturing and Automation, NIT, Warangal)	-	-	6	-	6	3
2	SEC	U26SE615X	Certificate Course in CNC Programming & Machining (CITD)	-	-	6	-	6	3
3	SEC	U26SE616X	Refrigeration and Air Conditioning Technician (NSQF)	-	-	6	-	6	3
4	SEC	U26SE617X	Certificate Course in Product Design and Development (CITD)	-	-	6	-	6	3
5	SEC	U26SE618X	Any other skill based course approved by BoS Chair and Dean AA	-	-	6	-	6	3

(Note to HoDs on PCC: Under PCC the departments shall plan appropriate courses upto 6th semester covering GATE syllabus).

VII SEMESTER (STREAM -II)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	OE	U26OE701Y	Open Elective – Management Basket (OE-MB)	2	1	-	3	3
2	PEC	U26ME702	Program Elective - I/ MOOCs-I	2	1	-	3	3
3	PCC	U26ME703	Computational Fluid Dynamics	2	1		3	3
4	PCC	U26ME704	Additive Manufacturing	2	1	-	3	3
5	PCC	U26ME705	Design of Transmission Systems	2	1	-	3	3
6	PCC	U26ME706	Computational Fluid Dynamics Laboratory	-	-	2	2	1
7	PCC	U26ME707	Production Engineering Laboratory-II	-	-	2	2	1
8	ELC	U26ME708	Internship Evaluation	-	-	2	2	1
9	ELC	U26ME709	Major Project Phase-1 / Industrial Internship -1	-	-	8	8	4
Total:				10	5	14	29	22
Additional Learning@:Maximum credits allowed for Honours/Minor				-	-	-	-	4
Total credits for Honours/Minor students:				-	-	-	-	26

Management Courses Basket		
Sr. No.	Course Code	Course Title
1.	U26OE701A	Management Economics and Accountancy
2.	U26OE701B	Finance for Engineers
3.	U26OE701C	Organizational Behaviour
4.	U26OE701D	E-Commerce and Digital Marketing
5.	U26OE701E	Any other course approved by BoS Chair and Dean AA

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

B. Tech Honours with Research

- (i). Students opting for B. Tech Honours with Research, shall complete Research Methodology Course (4 Credits) through MOOCs (OR) a workshop / FDP of not less than one week on “Research Methodologies” (4 Credits).
- (ii). Internship Evaluation for the students opting B. Tech Honours with Research, will be done on the 2-Month Research internship-II.

VIII SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	PEC	U26ME801	Program Elective - II / MOOCs-II	2	1	-	3	3
2	PEC	U26ME802	Program Elective - III / MOOCs-III	2	1	-	3	3
3	PEC	U26ME803	Program Elective - IV / MOOCs-IV	2	1	-	3	3
4	ELC	U26ME804	Major Project, Phase - 2 / Industrial Internship - 2	-	-	12	12	6
Total:				6	3	12	21	15
Additional Learning@:Maximum credits allowed for Honours/Minor				-	-	-	-	4
Total credits for Honours/Minor students:				-	-	-	-	19

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

B. Tech Honours with Research

Students opting for B. Tech Honours with Research, shall Publish a research paper in reputed journal indexed by SCI/ SCOPUS/Web of Science (4 Credits).

SUMMARY

SEMESTER	I	II	III	IV	V	VI	VII	VIII	TOTAL
CREDITS FOR STREAM-II	21	19	21	20	21	21	22	15	160

PROGRAM ELECTIVE COURSES (PEC)

There are four slots allotted to Program Elective Courses (PECs).

VERTICAL / PROFESSIONAL ELECTIVE	PROFESSIONAL ELECTIVE1 (PE1)	PROFESSIONAL ELECTIVE1 (PE2)	PROFESSIONAL ELECTIVE1 (PE3)	PROFESSIONAL ELECTIVE1 (PE4)
VERTICAL 1: Thermal Engineering	U26ME702A: Energy Audit and Management	U26ME801A: Power Plant Engineering	U26ME802A: Electric and Hybrid Vehicles	U26ME803A: Sustainable Energy Technology
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			
VERTICAL 2: Design Engineering	U26ME702B: Product Design	U26ME801B: Automobile Engineering	U26ME802B: Robotics	U26ME803B: Composite Materials
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			
VERTICAL 3: Production Engineering	U26ME702C: Computer Integrated Manufacturing	U26ME801C: Modern Machining Processes	U26ME802C: Digital Manufacturing	U26ME803C: Total Quality Management
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			
VERTICAL 4:	U26ME702D: Industry 4.0	U26ME801D: Design of Thermal Equipment	U26ME802D: Geometrical Dimensioning and Tolerancing	U26ME803D: Industrial Management
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			

SUMMARY OF CURRICULUM COMPONENTS

S. No.	CATEGORY	COURSE COMPONENT	TOTAL COURSES	TOTAL CREDITS	CURRICULUM CONTENT (%OF CREDITS)
1	BSC	Basic Science Courses	07	17	10.625
2	ESC	Engineering Science Courses	09	19	11.875
3	PCC	Program Core Courses	34	78	48.75
4	PEC	Program Elective Courses	04	12	7.5
5	OEC	Open Elective Courses	03	09	5.625
6	HSMC	Humanity, Social Sciences and Management Courses	02	04	2.5
7	ELC	Experiential Learning Courses	05	13	8.125
8	VAC	Value Added Courses	03	03	1.875
9	AEC	Ability Enhancement Courses	01	01	0.625
10	IKSC	Indian Knowledge System Courses	02	04	2.5
Total			70	160	100

The curriculum supports approximately 60% of Theory and 40 % of Lab including PW. Online courses are optional.

Semester	Number of Courses / Number of Credits (<i>Course Category wise</i>)										
	BSC	ESC	PCC	PEC	OEC	HSMC	ELC	VAC	AEC	IKSC	TOTAL
I	3/7	3/7	1/3	-	-	1/3	-	1/1	-	-	9/21
II	3/7	4/8	1/3	-	-	-	-	-	1/1	-	9/19
III	1/3	2/4	6/14	-	-	-	-	-	-	-	9/21
IV	-	-	8/18	-	-	-	-	2/2	-	-	10/20
V	-	-	7/15	-	1/3	-	1/1	-	-	1/2	10/21
VI	-	-	6/14	-	1/3	1/1	1/1	-	-	1/2	10/21
VII	-	-	5/11	1/3	1/3	-	2/5	-	-	-	9/22
VIII	-	-	-	3/9	-	-	1/6	-	-	-	4/15
Total	7/17	9/19	34/78	4/12	3/9	2/4	5/13	3/3	1/1	2/4	70/160
% Weightage of Course Category	10.625% (17/160)	11.875% (19/160)	48.75% (78/160)	7.5% (12/160)	5.625% (9/160)	2.5% (4/160)	8.125% (13/160)	1.875% (3/160)	0.625% (1/160)	2.5% (4/160)	100 % (160/160)

* Seminar- 1 C , Mini Project- 1 C, Internship Evaluation-1 C, Major Project : 4+6