

CURRICULUM I TO VIII: B. TECH MECHANICAL ENGINEERING

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No including Management courses
 Category Code Credits HMC 8

1 Humanities and Social Sciences

2 Basic Science courses BSC 26 3 Engineering Science Courses ESC 22

4 Program Core Courses PCC 76 5 Program Elective Courses PEC 15 6

Open Elective Courses OEC 3 7 Project work and Seminar PWS 10 8

Mandatory Non-credit Courses (P/F) with grade MNC ----- 9 Mandatory

Student Activities (P/F) MSA 2 Total Mandatory Credits 162

10	Value Added Course (Optional)	VAC	20
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No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem 1 2 3 4 5 6 7 8 Total Credits 17 21 22 22 23 23 15 17 160

Activity 50 50 --- 2 2
 Points
 Credits for Activity

G.Total		162
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Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc
 Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical

Engineering, Thermodynamics, , Design Engineering, Materials Engineering etc.
 Humanities and Social Sciences including Management courses: English, Humanities, Professional Communication, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc.

Mandatory non-credit courses: Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like E C L 2 0 1. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the Table 1.

Table 1: Code for the courses

Code Description

T Theory based courses (other the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)

L Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)

Q	Seminar Courses
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Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

MECHANICAL ENGINEERING

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2

Table 2: Departments and their codes

S L No	Department	Course Prefix	SL No	Department	Course Prefix
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1	Aeronautical Engineering	AO	23	Electronics and Communication Engineering	EC
2	Agriculture Engineering	AG	24	Electronics and Computer Engineering	ER
3	Applied Electronics and Instrumentation	AE	25	Electrical and Computer Engineering	EO
4	Artificial Intelligence	AI	26	Electrical and Electronics Engineering	EE
5	Artificial Intelligence and Data Science	AD	27	Food Technology	FT
6	Artificial Engineering and Machine Learning	AM	28	Humanities	HU
7	Automobile Engineering	AU	29	Industrial Engineering	IE
8	Biomedical Engineering	BM	30	Information Technology	IT
9	Biotechnology	BT	31	Instrumentation & Control	IC
10	Chemical Engineering	CH	32	Mandatory Courses	MC
11	Chemistry	CY	33	Mathematics	MA
12	Civil Engineering	CE	34	Mechanical Engineering	ME
13	Civil and Environmental Engineering	CN	35	Mechatronics	MR
14	Computer Science and Business Systems	CB	36	Metallurgy	MT
15	Computer Science and Design	CX	37	Mechanical (Auto)	MU
16	Computer Science and Engineering	CS	38	Mechanical (Prod)	MP
17	Computer Science and Engineering (Artificial Intelligence)	CA	39	Naval & Ship Building	SB
18	Computer Science and Engineering (Artificial Intelligence and Machine Learning)	CM	40	Physics	PH
19	Computer Science and Engineering (Data Science)	CD	41	Polymer Engineering	PO

20	Computer Science and Engineering (Cyber Security)	CC	42	Production Engineering	PE
21	Cyber Physical Systems	CP	43	Robotics and Automation	RA
22	Electronics & Biomedical	EB	44	Safety & Fire Engineering	FS

MECHANICAL ENGINEERING

SEMESTER I

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT A MAT 101 LINEAR

ALGEBRA AND CALCULUS 3-1-0-4-4

PHT 110 ENGINEERING PHYSICS B 3-1-0-4-4

B
1/2

CYT 100 ENGINEERING CHEMISTRY 3-1-0-4-4 EST 100

ENGINEERING MECHANICS 2-1-0-3-3

C
1/2

EST 110 ENGINEERING GRAPHICS 2-0-2-4-3

CIVIL & MECHANICAL ENGINEERING ELECTRONICS ENGINEERING

D
1/2

EST 130 BASICS OF 4-0-0-4-4 4-0-0-4-4

EST 120 BASICS OF ELECTRICAL &

E HUN 101 LIFE SKILLS 2-0-2-4--

PHL 120 ENGINEERING PHYSICS LAB 0-0-2-2-1

S
1/2

CYL 120 ENGINEERING CHEMISTRY LAB 0-0-2-2-1 ESL 120 CIVIL

& MECHANICAL WORKSHOP 0-0-2-2-1

T
1/2

0-0-2-2-1

ESL 130 ELECTRICAL & ELECTRONICS
WORKSHOP

TOTAL		23/24 *	17
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*Minimum hours per week

NOTE:

To make up for the hours lost due to induction program, one extra hour may be allotted to each course

MECHANICAL ENGINEERING

SEMESTER II

	SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
			TRANSFORMS			
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND		3-1-0	4-4	
			PHT 110 ENGINEERING PHYSICS B	3-1-0	4-4	
B						
1/2			CYT 100 ENGINEERING CHEMISTRY	3-1-0	4-4	EST 100
			ENGINEERING MECHANICS	2-1-0	3-3	
C						
1/2			EST 110 ENGINEERING GRAPHICS	2-0-2	4-3	
			CIVIL & MECHANICAL ENGINEERING			ELECTRONICS ENGINEERING
D			EST 130 BASICS OF	4-0-0	4-4	4-0-0
1/2			EST 120 BASICS OF			
			ELECTRICAL &			
			E HUN 102 PROFESSIONAL COMMUNICATION	2-0-2	4-4	F EST 102
			PROGRAMMING IN C	2-1-2	5-4	
			PHL 120 ENGINEERING PHYSICS LAB	0-0-2	2-1	
S						
1/2			CYL 120 ENGINEERING CHEMISTRY LAB	0-0-2	2-1	ESL 120 CIVIL & MECHANICAL WORKSHOP
T						
1/2						0-0-2
			ESL 130 ELECTRICAL & ELECTRONICS WORKSHOP			2-1

TOTAL		28/29	21
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NOTE:

1. Engineering Physics B and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics B in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics B in a semester should attend Physics Lab in the same semester and students opting for

Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.

2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.

MECHANICAL ENGINEERING

3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

MECHANICAL ENGINEERING

SEMESTER III

SLOT COURSE NO.
COURSES L-T-P HOURS CREDIT

EQUATION AND COMPLEX ANALYSIS
3-1-0-4-4

A MAT201 PARTIAL DIFFERENTIAL

B MET201 MECHANICS OF SOLIDS 3-1-0-4-4 C MET203 MECHANICS OF
FLUIDS 3-1-0-4-4 D MET205 METALLURGY & MATERIAL SCIENCE 3-1-0 4 4

EST200 DESIGN AND ENGINEERING 2-0-0-2-2

E

1/2

HUT200 PROFESSIONAL ETHICS 2-0-0-2-2

F MCN201 SUSTAINABLE ENGINEERING 2-0-0-2--- S MEL201 COMPUTER
AIDED MACHINE DRAWING 0-0-3-3-2 T MEL203 MATERIALS TESTING LAB
0-0-3-3-2

R/M VAC REMEDIAL/MINOR COURSE 3-1-0-4** 4

TOTAL	26/30	22/26
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NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions shall keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

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SEMESTER IV

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT
AND NUMERICAL METHODS

A MAT202 PROBABILITY, STATISTICS 3-1-0-4-4

B MET202 ENGINEERING THERMODYNAMICS 3-1-0-4-4 C MET204
MANUFACTURING PROCESS 3-1-0-4-4 D MET206 FLUID MACHINERY 3-1-0

4 4 EST200 DESIGN AND ENGINEERING 2-0-0-2-2

E

HUT200 PROFESSIONAL ETHICS 2-0-0-2-2 1/2

F MCN202 CONSTITUTION OF INDIA 2-0-0-2-- S MEL202 FM & HM LAB 0-0-3

3-2 T MEL204 MACHINE TOOLS LAB-I 0-0-3-3-2

R/M/ H

COURSE 3-1-0-4*4

VAC REMEDIAL/MINOR/HONORS

TOTAL	26/30	22/26
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NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

MECHANICAL ENGINEERING

SEMESTER V

COURSES L-T-P-HOURS-CREDI T

SLOT COURSE NO.

A MET301 MECHANICS OF MACHINERY 3-1-0-4-4 B MET303 THERMAL

ENGINEERING 3-1-0-4-4 C ^{MET305} INDUSTRIAL & SYSTEMS ENGINEERING

3-1-0-4-4 D MET307 MACHINE TOOLS AND METROLOGY 3-1-0 4 4

E HUT300 INDUSTRIAL FOREIGN TRADE

1/2 ECONOMICS AND 3-0-0-3-3

HUT310 MANAGEMENT FOR ENGINEERS 3-0-0-3-3 F MCN301

DISASTER MANAGEMENT 2-0-0-2-- S MEL331 MACHINE TOOLS LAB-II 0-0-3

3-2 T MEL333 THERMAL ENGINEERING LAB-I 0-0-3-3-2

R/M/H VAC REMEDIAL/MINOR/HONORS COURSE 3-1-0-4*4

TOTAL	27/31	23/27
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NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50%

of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.

2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

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SEMESTER VI

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT A MET302 HEAT & MASS

TRANSFER 3-1-0-4-4

B MET304 DYNAMICS AND DESIGN OF MACHINERY MANUFACTURING ENGINEERING
3-1-0-4-4 3-1-0-4-4

C MET306 ADVANCED

D METXXX

PROGRAM ELECTIVE I 2-1-0 3 3

HUT300 INDUSTRIAL ECONOMICS AND E FOREIGN TRADE
3-0-0-3 3

HUT310 MANAGEMENT FOR ENGINEERS 3-0-0-3 3 ½

F MET308 COMPREHENSIVE COURSE WORK 1-0-0-4-1
0-0-3-3-2

S MEL332 COMPUTER AIDED DESIGN & ANALYSIS LAB

T MEL334 THERMAL ENGINEERING LAB-II 0-0-3-3-2
VAC URS COURSE

R/M/ H REMEDIAL/MINOR/HONO 3-1-0-4*-4

TOTAL	25/29	23/27
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PROGRAM ELECTIVE I

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT

[REDACTED]

MET342 IC ENGINE COMBUSTION AND POLLUTION D 2-1-0 3 3

MET372	ADVANCED METAL JOINING TECHNIQUES	2-1-0		
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NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.

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2. **All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 2 to 4 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honors programme, he/she can be given remedial class.

3. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted online by the University. Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum.

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SEMESTER VII

SLOT COURSE NO. COURSES L-T-P ~~HOURS~~ CREDIT A MET401 DESIGN OF MACHINE ELEMENTS 2-1-0-~~3~~-3 B METXXX PROGRAM ELECTIVE II 2-1-0-~~3~~-3 C METXXX OPEN ELECTIVE 2-1-0-~~3~~-3 D MCN401 INDUSTRIAL SAFETY ENGINEERING 2-1-0 3 --- S MEL411 MECHANICAL ENGINEERING LAB 0-0-3-~~3~~-2 T MEQ413 SEMINAR 0-0-3-~~3~~-2 U MED415 PROJECT PHASE I 0-0-6-~~6~~-2

R/M/ H

COURSE 3-1-0-~~4~~-4

VAC REMEDIAL/MINOR/HONORS

TOTAL	24/28	15/19
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PROGRAM ELECTIVE II

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT

MET413 ADVANCED NONDESTRUCTIVE
METHODS IN TESTING
2-1-0

MET423 OPTIMIZATION TECHNIQUES AND 3 3
2-1-0

APPLICATIONS

B

[REDACTED]				
[REDACTED]				
[REDACTED]				
[REDACTED]				
MET473	AIR CONDITIONING AND REFRIGERATION	2-1-0		

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OPEN ELECTIVE

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. The courses listed below are offered by the Department of MECHANICAL ENGINEERING for students of other undergraduate branches offered in the college under KTU.

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT
ANALYTICS

MET415 INTRODUCTION TO BUSINESS 2-1-0

MET425 QUANTITATIVE TECHNIQUES FOR 3 3
2-1-0

ENGINEERS

C

[REDACTED]				
[REDACTED]				
MET455	QUALITY ENGINEERING AND MANAGEMENT	2-1-0		

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NOTE :

- *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student

does not opt for minor/honours programme, he/she can be given remedial class.

2.

Seminar: To encourage and motivate the students to read and collect recent and reliable information from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance : 10

Seminar Diary : 10

Guide : 20

Report : 20

Presentation : 40

3.

Project Phase I: The course 'Project Work' is mainly intended to evoke the innovation and invention skills in a student. The course will provide an opportunity to synthesize and apply the knowledge and analytical skills learned, to be developed as a prototype or simulation. The project extends to 2 semesters and will be evaluated in the 7th and 8th semester separately, based on the achieved objectives. One third of the project credits shall be completed in 7th semester and two third in 8th semester. It is recommended that the projects may be finalized in the thrust areas of the respective engineering stream or as interdisciplinary projects. Importance should be given to address societal problems and developing indigenous technologies. The assignment to normally include:

- Literature study/survey of published literature on the assigned topic
- Formulation of objectives
- Formulation of hypothesis/ design/ methodology
- Formulation of work plan and task allocation.
- Block level design documentation
- Seeking project funds from various agencies
- Preliminary Analysis/Modeling/Simulation/Experiment/ Design/Feasibility study
- Preparation of Phase 1 report

Total marks: 100, only CIE, minimum required to pass 50

Guide : 30

Interim evaluation by the Evaluation committee : 20

Final evaluation by the Evaluation committee : 30

Phase – I Report (By Evaluation committee) : 20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor.

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SEMESTER VIII

SLOT COURSE NO. COURSES L-T-P-HOURS-CREDIT A MET402

MECHATRONICS 2-1-0-3-3 B METXXX PROGRAM ELECTIVE III 2-1-0-3-3 C
 METXXX PROGRAM ELECTIVE IV 2-1-0-3-3 D METXXX PROGRAM ELECTIVE V
 2-1-0 3 3 E MET404 COMPREHENSIVE VIVA VOCE 1-0-0-4-1 U MED416
 PROJECT PHASE II 0-0-12-42-4

R/M/ H
 VAC REMEDIAL/MINOR/HONORS

COURSE 3-1-0-4*4

TOTAL	25/28	17/21
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PROGRAM ELECTIVE III

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT

[REDACTED] QUALITY MANAGEMENT [REDACTED]
 [REDACTED] INDUSTRIAL HYDRAULICS [REDACTED]
 [REDACTED] PRESSURE VESSEL AND PIPING DESIGN [REDACTED]
 [REDACTED] MICRO AND NANO MANUFACTURING
 [REDACTED] DATA ANALYTICS FOR ENGINEERS [REDACTED]
 [REDACTED] INDUSTRIAL TRIBOLOGY [REDACTED]

MET474	HEATING AND VENTILATION SYSTEMS	2-1-0		
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PROGRAM ELECTIVE IV

SLOT COURSE NO.
 COURSES L-T-P HOURS CREDIT

[REDACTED] [REDACTED] HEAT TRANSFER EQUIPMENT
 DESIGN [REDACTED] C
 [REDACTED] ROBOTICS AND AUTOMATION [REDACTED]
 [REDACTED] TECHNOLOGY MANAGEMENT [REDACTED]
 [REDACTED] COMPOSITE MATERIALS [REDACTED]
 LEARNING 2-1-0
 MET 426 ARTIFICIAL INTELLIGENCE AND
 MACHINE 3 3
 [REDACTED] ACOUSTICS AND NOISE CONTROL

MET 476	CRYOGENIC ENGINEERING	2-1-0		
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PROGRAM ELECTIVE V

SLOT COURSE NO. COURSES L-T-P HOURS CREDIT

		RELIABILITY ENGINEERING		
		PROJECT PLANNING AND MANAGEMENT		
		FRACTURE MECHANICS		
			ENERGY ENGINEERING	
		GAS TURBINES AND JET		
			ADDITIVE MANUFACTURING	
		PROPULSION		
		ADVANCED		

MET 478	POWER PLANT ENGINEERING	2-1-0		
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NOTE

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12). If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. Comprehensive Course Viva: The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the syllabus mentioned for comprehensive course work in the sixth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
3. Project Phase II: The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under Phasel;
 - Review and finalization of the Approach to the Problem relating to the assigned topic;

- Detailed Analysis/ Modelling/ Simulation/ Design/ Problem Solving/ Experiment as needed;
- Final development of product/process, testing, results, conclusions and future directions;
- Preparing a paper for Conference presentation/Publication in Journals, if possible;

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- Preparing a Dissertation in the standard format for being evaluated by the Department;
- Final Presentation before a Committee

Total marks: 150, only CIE, minimum required to pass 75

Guide : 30

Interim evaluation, 2 times in the semester by a committee : 50

Quality of the report evaluated by the above committee : 30

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor).

Final evaluation by the final evaluation committee : 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute and a senior faculty from a sister department. The same committee will conduct Comprehensive for 50 marks).

MINOR

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx with Minor in yyy". The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by M slot courses.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

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(iv) There won't be any supplementary examination for the courses chosen for Minor. (v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded.

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for B.Tech Minor in MECHANICAL ENGINEERING Branch can opt to study the courses listed below:

BASKET I BASKET II BASKET III S

Semester	Course		H O U R S		No.	Name		C R E		H O U R S		No.	Name		C R E									
	No.	Name	Course	CRE		Course	CRE	Course	CRE	Course	CRE		Course	CRE										
S3	MET281	MECHANICS OF MATERIALS	4	4	MET283	FLUID MECHANICS & MACHINERY	4	4	MET285	MATERIAL SCIENCE & TECHNOLOGY	4	4	MET284	THERMODYNAMICS	4	4	MET286	MANUFACTURING TECHNOLOGY	4	4				
S4	MET282	THEORY OF MACHINES	4	4	MET282	THEORY OF MACHINES	4	4	MET381	DYNAMICS OF MACHINES	4	4	MET383	THERMAL SCIENCE AND ENGINEERING	4	4	MET385	MACHINE TOOLS ENGINEERING	4	4				
S5	MET381	DYNAMICS OF MACHINES	4	4	MET383	THERMAL SCIENCE AND ENGINEERING	4	4	MET385	MACHINE TOOLS ENGINEERING	4	4	MET382	MACHINE DESIGN	4	4	MET384	HEAT TRANSFER	4	4	MET386	INDUSTRIAL ENGINEERING	4	4
S6	MET382	MACHINE DESIGN	4	4	MET384	HEAT TRANSFER	4	4	MET386	INDUSTRIAL ENGINEERING	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4
S7	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4

HONOURS

Honours is an additional credential a student may earn if s/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of

engineering concerned. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx, with Honours.” The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all

MECHANICAL ENGINEERING

semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BOS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The honours courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20 credits from value added courses).
- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of ‘C’ or better for all courses under honours.
- (iv) There won't be any supplementary examination for the courses chosen for honours.
- (v) On successful accumulation of credits at the end of the programme, “Bachelor of Technology in xxx, with Honours” will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of ‘C’ or better for all courses chosen for honours and without any history of ‘F’ Grade.
- (vi) The registration for honours program will commence from semester 4 and the all academic units offering honours in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. In any case, they should carry out a mini project based on the chosen area in S8. Students who have registered for B.Tech Honours in MECHANICAL ENGINEERING can opt to study the courses listed below.

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Course No.	Course Name	Hours	Credits	Course No.	Course Name	Hours	Credits	Course No.	Course Name	Hours	Credits
S4	MET292 CONTINUUM MECHANICS	4	4	MET294 ADVANCED MECHANICS	4	4	MET296 MATERIALS IN MANUFACTURING	4	4		

S5	MET393	EXPERIMENTAL STRESS	4	4	MET395	ADVANCED THERMODYNAMICS	4	4	MET397	FLUID POWER	4	4
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Course No.	Course Name	Hours	Credits	Course No.	Course Name	Hours	Credits	Course No.	Course Name	Hours	Credits	
S6	MET394 ADVANCED DESIGN SYNTHESIS	4	4	MET497 COMPUTATIONAL METHODS IN FLUID FLOW & HEAT TRANSFER	4	4	MET499 CONTROLLED MACHINING	4	4	MICS AUTOMATION MACHINING	4	4
S7	MET495 ADVANCED THEORY OF VIBRATIONS	4	4	MET396 COMPRESSIBLE NUMERICAL	4	4	MET398 ADVANCED PRECISION	4	4			

S8	MED496	MINIPROJECT	4	4	MED496	MINIPROJECT	4	4	MED496	MINIPROJECT	4	4
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INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batchmates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- Values and Ethics: Focus on fostering a strong sense of ethical judgment and moral

fortitude.

- Creativity: Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- Leadership, Communication and Teamwork: Develop a culture of teamwork and group communication.
 - Social Awareness: Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.