CURRICULUM
B.TECH. MECHANICAL ENGINEERING
(In Association with *CADD CENTRE*)
CHOICE BASED CREDIT SYSTEM

STUDENTS LEARNING OUTCOMES

The curriculum and syllabi of B.Tech. Mechanical Engineering Program (2017-18) conform to Outcome Based Education (OBE) for a flexible and structured Choice Based Credit system (CBCS). In general, **TEN STUDENT OUTCOMES** (a-j) have been identified and the curriculum and syllabi have been chosen in such a way that each of the modules meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further, each module in the program spells out clear instructional objectives which are mapped to the student outcomes.

The Student Outcomes are:

(a) Ability to apply knowledge of Mathematics and science in Mechanical engineering solutions.
(b) Ability to understand the engineering concepts and their applications using the acquired broadbased knowledge.
(c) Ability to design, set up and conduct relevant experiments as well as to analyze and interpret data.
(d) Ability to use the techniques, skills, and modern engineering hardware and software tools necessary for engineering practice.
(e) Ability to identify, analyze and solve engineering problems in related multiple disciplines including thermal, manufacturing and industrial systems and formulate design requirements.
(f) Ability to design a system, component or process to meet desired needs within realistic constraints such as health & safety, economic, aesthetic, environmental, social, ethical and sustainability.
(g) Ability to function as consultant in mechanical design and production industries.
(h) An understanding of professional and ethical responsibility.
(i) Ability to communicate effectively in diverse groups and exhibit leadership qualities.
(j) To develop an understanding on global environment and its protection.

B.TECH. MECHANICAL ENGINEERING

SUMMARY OF PROGRAM CURRICULUM

Category		Sub-Category	Total Number of Credits (B.Tech)	Total Number of Credits (B.Tech-LEET)	Min Required Credits (B.Tech)	Min Required Credits (B.Tech-LEET)	Percentage of Total credits
G	General		**52**	**0**	**48**	**0**	26%
E	Engineering	Programme Core (PC)	73	73	73	73	
		Programme Elective (PE)	28	28	24	24	
		Generic Eletive (GE)	8	8	4	4	
		Project (PD)	20	20	20	20	
Total: Engineering			**129**	**129**	**121**	**121**	64%
M	Mangement		**7**	**7**	**7**	**7**	3%
P	Professional Enrichment	Ability enhaneent (AE)	8	8	7	7	
		Skill enhancement (SE)	4	4	4	4	
		Creativity & innoation (CI)	1	1	0	0	
		Co-Curriular Activity (CA)	1	1	0	0	
Total: Professional Enrichment			**14**	**14**	**11**	**11**	7%
Overall Total			202	150*	187	139*	100%

Note:

Students are to earn at least 187/139*credits out of 202/150* credits to become eligible for the award of B.Tech degree.

* FOR LATERAL ENTRY

PROGRAM SCHEME

SEMESTER - I

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
ENGL0101	G		ENGLISH	3	0	0	3	25	75	100
MATH0101	G		APPLIED MATHEMATICS - I	3	1	0	3.5	50	100	150
CHEM0101	G		INDUSTRIAL CHEMISTRY	3	0	0	3	25	75	100
CHEM0102	G		INDUSTRIAL CHEMISTRY LAB	0	0	2	1	25	25	50
PHYS0101	G		APPLIED PHYSICS – I	3	1	0	3.5	50	100	150
PHYS0102	G		APPLIED PHYSICS – I LAB	0	0	2	1	25	25	50
ECEN1101	G		ELECTRICAL TECHNOLOGY	2	0	0	2	25	50	75
ECEN1102	G		ELECTRICAL TECHNOLOGY LAB	0	0	2	1	25	25	50
CSEN1101	G		FUNDAMENTALS OF COMPUTERS AND PROGRAMMING (WITH C)	4	0	0	4	50	100	150
CSEN1102	G		FUNDAMENTALS OF COMPUTERS AND PROGRAMMING (WITH C) LAB	0	0	2	1	25	25	50
	G		FOREIGN LANGUAGE–PART-I[#]	2	0	0	2	25	50	75
TOTAL				**20**	**2**	**8**	**25**	**350**	**650**	**1000**

L = Lecture

T = Tutorial

C = Credit Point

 # FOREIGN LANGUAGE

One foreign language out of the following

MODULE COD	MODULE NAME
LANF0101	French
LANG0102	German
LANS0103	Spanish

SEMESTER - II

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
PHYS0103	G		APPLIED PHYSICS-II	3	1	0	3.5	50	100	150
PHYS0104	G		APPLIED PHYSICS-II LAB	0	0	2	1	25	25	50
ECEN0104	G		BASICS OF ELECTRONICS	2	0	0	2	25	50	75
ECEN0105	G		BASICS OF ELECTRONICS LAB	0	0	2	1	25	25	50
MECH1101	G		WORKSHOP TECHNOLOGY	3	0	0	3	25	75	100
MECH1102	G		WORKSHOP TECHNOLOGY LAB	0	0	2	1	25	25	50
CIVL0101	G		BASICS OF CIVIL ENGINEERING	2	0	0	2	25	50	75
CIVL0102	G		BASICS OF CIVIL ENGINEERING LAB	0	0	2	1	25	25	50
MATH0116	G		APPLIED MATHEMATICS-II	4	1	0	4.5	50	100	150
MATH0117	G		NUMERICAL METHODS	3	0	0	3	25	75	100
VALU0109	G		VALUE EDUCATION	2	0	0	2	25	50	75
CSEN1103	G		PC LAB	0	0	2	1	25	25	50
	G		FOREIGN LANGUAGE PART- II [#]	2	0	0	2	25	50	75
TOTAL				**21**	**2**	**10**	**27**	**375**	**675**	**1050**

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

[#] FOREIGN LANGUAGE

One foreign language out of the following

MODULE COD	MODULE NAME
LANF0104	French
LANG0105	German
LANS0106	Spanish

SEMESTER III

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH2101	E	PC	THERMODYNAMICS	3	0	0	3	25	75	100
MECH2102	E	PC	COMPUTER AIDED DESIGN & GRAPHICS	3	1	0	3.5	50	100	150
MECH2103	E	PC	COMPUTER AIDED DESIGN & GRAPHICS LAB	0	0	2	1	25	25	50
MECH2104	E	PC	ENGINEERING MECHANICS	3	1	0	3.5	50	100	150
MECH2105	E	PC	ENGINEERING MECHANICS LAB	0	0	2	1	25	25	50
MGMT0101	M		MANAGEMENT & PROFESSIONAL LEADERSHIP	3	0	0	3	25	75	100
VALU0119	P	AE	APTITUDE I	2	0	0	2	25	50	75
VALU0123	P	SE	PROFESSIONAL COMMUNICATION-I	2	0	0	2	25	50	75
ENGL0109	P	AE	ACADEMIC WRITING	0	0	2	1	25	25	50
	P	AE	YOGA/NCC/NSS*	0	0	2	1	25	25	50
	E	PE	ELECTIVE-I	3	0	0	3	25	75	100
	E	PE	ELECTIVE-I LAB	0	0	2	1	25	25	50
	E	PE	ELECTIVE-II	3	1	0	3.5	50	100	150
			TOTAL	22	3	10	28.5	**400**	**750**	**1150**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

MODULE CODE	MODULE NAME*
VALU0118	YOGA
VALU0121	NCC
VALU0122	NSS

ELECTIVES

MODULE CODE	ELECTIVE-I	MODULE CODE	ELECTIVE-II
MECH2206	MATERIAL SCIENCE	MECH2210	ENERGY MANAGEMENT PRINCIPLES
MECH2207	MATERIAL SCIENCE LAB	MECH2211	RAPID PROTOTYPING
MECH2208	METAL CUTTING & TOOL DESIGN		
MECH2209	METAL CUTTING & TOOL DESIGN LAB		

SEMESTER IV

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH2112	E	PC	FLUID MECHANICS	3	1	0	3.5	50	100	150
MECH2113	E	PC	FLUID MECHANICS LAB	0	0	2	1	25	25	50
MECH2114	E	PC	MANUFACTURING TECHNOLOGY	3	1	0	3.5	50	100	150
MECH2115	E	PC	MANUFACTURING TECHNOLOGY LAB	0	0	2	1	25	25	50
MECH2116	E	PC	STRENGTH OF MATERIALS-1	3	1	0	3.5	50	100	150
MECH2117	E	PC	STRENGTH OF MATERIALS-1 LAB	0	0	2	1	25	25	50
MECH2118	E	PC	KINEMATICS OF MACHINE	3	1	0	3.5	50	100	150
MECH2119	E	PC	KINEMATICS OF MACHINE LAB	0	0	2	1	25	25	50
MECH2120	E	PC	CREO	3	0	0	3	25	75	100
MECH2121	E	PC	CREO LAB	0	0	2	1	25	25	50
	E	PE	ELECTIVE- III	3	0	0	3	25	75	100
	E	PE	ELECTIVE- III LAB	0	0	2	1	25	25	50
	E	PE	ELECTIVE-IV	3	0	0	3	25	75	100
			TOTAL	21	4	12	29	**425**	**775**	**1200**

L = Lecture
T = Tutorial
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C = Credit Point

ELECTIVES

MODULE CODE	ELECTIVE-III	MODULE CODE	ELECTIVE-IV
MECH2222	STEAM & POWER GENERATION	MECH2228	QUALITY ENGINEERING
MECH2223	STEAM & POWER GENERATION LAB	MECH2229	COMPUTER INTEGRATED MANUFACTURING
MECH2224	RENEWABLE ENERGY RESOURCES		
MECH2225	RENEWABLE ENERGY RESOURCES LAB		
MECH2226	MANAGEMENT OF MANUFACTURING SYSTEM		
MECH2227	MANAGEMENT OF MANJUFACTURING SYSTEM LAB		

SEMESTER V

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH3101	E	PC	DYNAMICS OF MACHINES	3	1	0	3.5	50	100	150
MECH3102	E	PC	DYNAMICS OF MACHINES LAB	0	0	2	1	25	25	50
MECH3103	E	PC	FLUID MACHINE	3	1	0	3.5	50	100	150
MECH3104	E	PC	FLUID MACHINE LAB	0	0	2	1	25	25	50
MECH3105	E	PC	MECHANICAL MACHINE DESIGN-1	3	1	0	3.5	50	100	150
MECH3106	E	PD	SPECIALIZED MINOR PROJECT (GROUP) (ANSYS)LAB	0	0	4	2	50	50	100
MECH3107	E	PD	INDUSTRIAL TRAINING I (TO BE UNDERGONE AFTER IV SEMESTER)	0	0	0	1	50	0	50
VALU0136	P	AE	APTITUDE II	2	0	0	2	25	50	75
VALU0140	P	SE	PROFESSIONAL COMMUNICATION -II	2	0	0	2	25	50	75
	E	PE	ELECTIVE-V	3	0	0	3	25	75	100
	E	PE	ELECTIVE-VI	3	0	0	3	25	75	100
	E	PE	ELECTIVE-VI LAB	0	0	2	1	25	25	50
TOTAL				**19**	**3**	**10**	**26.5**	**400**	**650**	**1050**

L = Lecture
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P = Practical
C = Credit Point

ELECTIVES

MODULE CODE	ELECTIVE-V	MODULE CODE	ELECTIVE-VI
MECH3208	INDUSTRIAL ENGINEERING	MECH3210	MEASUREMENT & INSTRUMENTATION
MECH3209	FINITE ELEMENT METHODS	MECH3211	MEASUREMENT & INSTRUMENTATION LAB
		MECH3212	AUTOMOBILE ENGINEERING
		MECH3213	AUTOMOBILE ENGINEERING LAB

SEMESTER VI

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH3114	E	PC	INTERNAL COMBUSTION ENGINES & GAS TURBINES	3	0	0	3	25	75	100
MECH3115	E	PC	INTERNAL COMBUSTION ENGINES & GAS TURBINES LAB	0	0	2	1	25	25	50
MECH3116	E	PC	HEAT TRANSFER	3	0	0	3	25	75	100
MECH3117	E	PC	HEAT TRANSFER LAB	0	0	2	1	25	25	50
MECH3118	E	PC	MECHANICAL MACHINE DESIGN-2	3	1	0	3.5	50	100	150
MECH3119	E	PC	OPERATION RESEARCH	3	0	0	3	25	75	100
MECH3120	E	PD	SPECIALIZED MINOR PROJECT (INDIVIDUAL) (REVERSE ENGINEERING INCLUDING 3D SCANNING + 3D PRINTING	0	0	8	4	100	100	200
MECH3121	P	CI	CREATIVITY AND INNOVATION				1	25	25	50
	E	PE	ELECTIVE-VII	3	0	0	3	25	75	100
	E	GE	ELECTIVE-A**	4	0	0	4	50	100	150
TOTAL				**19**	**2**	**12**	**26.5**	**375**	**675**	**1050**

L = Lecture
T = Tutorial
P = Practical
C = Credit Point

ELECTIVES

MODULE CODE	ELECTIVE-VII
MECH3222	AUTOMATIC CONTROL
MECH3223	STATISTICAL QUALITY CONTROL & RELIABILITY

MODULE CODE	GENERIC ELECTIVE - A
SAPM0321	SAP (MM)$^{\psi}$
SAPS0322	SAP (SD)$^{\psi}$
SAPH0323	SAP (HCM)$^{\psi}$
	ONE / TWO MOOCS MODULE COMPRISING TOTAL OF 4 CREDIT POINTS.

ψ Additional fee, if any, shall be borne by the student.

SEMESTER VII

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH4101	E	PC	REFRIGERATION & AIR - CONDITIONING	3	1	0	3.5	50	100	150
MECH4102	E	PC	REFRIGERATION & AIR - CONDITIONING LAB	0	0	2	1	25	25	50
MECH4103	E	PC	STRENGTH OF MATERIAL-2	3	1	0	3.5	50	100	150
MECH4104	E	PC	MECHANICAL VIBRATIONS	4	0	0	4	50	100	150
MECH4105	E	PD	SPECIALIZED MAJOR PROJECT (GROUP)##	0	0	8	4	100	100	200
MECH4106			INDUSTRIAL TRAINING II (TO BE UNDERGONE AFTER VI SEMESTER)	0	0	0	1	50	0	50
CLUB0101	P	CA	*CO-CUURICULAR ACTIVITY*	0	0	0	1	25	0	25
	E	PE	ELECTIVE-VIII	3	1	0	3.5	50	100	150
	E	GE	ELECTIVE-B**	4	0	0	4	50	100	150
TOTAL				**17**	**3**	**10**	**25.5**	**450**	**625**	**1075**

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

ELECTIVES

COURSE CODE	ELECTIVE-VIII
MECH4207	POWER PLANT ENGINEERING
MECH4208	ROBOTICS

**** To be chosen from Generic Electives offered by departments other than the parent Department.**

Only advisory support shall be provided by the faculty.

SEMESTER VIII

MODULE CODE	CATEGORY	SUB-CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
ENVS0101	P	AE	ENVIRONMENTAL SCIENCES	2	0	0	2	25	50	75
MGMT0103	M		ENTRPRENURESHIP	4	0	0	4	50	100	150
MECH4109	E	PD	SPECIALIZED MAJOR PROJECT (INDIVIDUAL)##	0	0	16	8	200	200	400
TOTAL				**6**	**0**	**16**	**14**	**275**	**350**	**625**

L = Lecture

T = Tutorial

P = Practical

C = Credit Point

Only advisory support shall be provided by the faculty.