

# MECHANICAL ENGINEERING

## ***COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2007 BATCH***

<b>Semester I</b>							<b>Semester – II</b>						
<b>Course code</b>	<b>Course Name</b>	<b>Credit Structure</b>					<b>Course Code</b>	<b>Course Name</b>	<b>Credit Structure</b>				
		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>		MA 106 And MA 108	Linear Algebra and Ordinary Differential Equations I	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	
CH 103+	Chemistry	2	1	0	6				3	1	0	8	
CS 101	Computer Programming	2	0	2	6		CH 103+	Chemistry	2	1	0	6	
HS 101	Economics	3	0	0	6		PH 103*	Electricity and Magnetism	3	0	0	6	
MA 105	Calculus	3	1	0	8		PH 105*	Modern Physics	3	1	0	8	
PH 103*	Electricity and Magnetism	2	1	0	6		ME 152	Introduction to Mechanical Engg.	3	0	0	6	
PH 105*	Modern Physics	2	1	0	6		IC 102	Data Analysis and Interpretations	2	1	0	6	
CH 117+	Chemistry Lab	0	0	3	3		CH 117*	Chemistry Lab.	0	0	3	3	
ME 113*	Workshop Practice	0	1	3	5		ME 113+	Workshop Practice	0	1	3	5	
ME 119*	Engineering Graphics and Drawing	1	0	3	5		ME 119+	Engineering Graphics and Drawing	0	1	3	5	
PH 117+	Physics Lab	0	0	3	3		PH 117*	Physics Lab.	0	0	3	3	
NC 101#	National Cadet Corps (NCC)	0	0	0	P/NP		NC 102#	National Cadet Corps (NCC)	0	0	0	P/NP	
NO 101#	National Sports Organization (NSS)	0	0	0	P/NP		NO 102#	National Sports Organization (NSS)	0	0	0	P/NP	
NS 101#	National Service Scheme (NSS)	0	0	0	P/NP		NS 102#	National Service Scheme (NSS)	0	0	0	P/NP	
* Any one of these two courses and any one of these Lab courses only for <b>D3 D4</b> + Only for D1 D2 # Any one of these three P/NP courses							* Any one of these two courses and any one of these Lab courses only for <b>D1 D2</b> ** Engineering Mechanics offered by Civil Engineering Department is the DIC + Only for D3 D4 # Any one of these three P/NP courses						

**MECHANICAL ENGINEERING DEPARTMENT**  
**COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2007 BATCH**

Semester III							Semester – IV						
Course code	Course Name	Credit Structure					Course Code	Course Name	Credit Structure				
		L	T	P	C				L	T	P	C	
ME 201	Solid Mechanics	2	1	0	6		ME 202	Strength of Materials	2	1	0	6	
ME 209	Thermodynamics	2	1	0	6		ME 203	Fluid Mechanics	2	1	0	6	
EE 101	Electric Circuits	3	1	0	8		ME 206	Manufacturing Processes I	2	1	0	6	
MM 206	Engineering Metallurgy	2	1	0	6		MA 214	Numerical Analysis	3	1	0	8	
IC 211	Experimental Engineering Lab	0	0.5	3	4		ME 218	Solid Mechanics Lab	0	0	3	3	
							ME 213	Manufacturing Practice Lab.	0	1	3	5	
<b>Total</b>					<b>30</b>		<b>Total</b>					<b>34</b>	
COURSES FOR HONOR REQUIREMENT							COURSES FOR HONOR REQUIREMENT						
COURSES FOR MINOR REQUIREMENT							COURSES FOR MINOR REQUIREMENT						
ME 201	Solid Mechanics	2	1	0	6		ME 203	Fluid Mechanics	2	1	0	6	

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Semester V							Semester – VI						
Course code	Course Name	Credit Structure					Course Code	Course Name	Credit Structure				
		L	T	P	C				L	T	P	C	
ME 346	Heat Transfer	2	1	0	6		ME 306	Applied Thermodynamics	2	1	0	6	
ME 407	Industrial Engg. and Operations Research	2	1	0	6		ME 316	Kinematics and Dynamics of Machines	2	1	0	6	
ME 338	Manufacturing Processes II	2	1	0	6			Departmental Elective I	3	0	0	6	
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6		ES 200 And HS 200	Environmental Studies: Science and Engg And Environmental Studies	3	0	0	3	
ME 374	Manufacturing Processes Lab	0	0	3	3		ME 370	Kinematics and Dynamics of Machines Lab	0	0	3	3	
ME 214	Fluid Mechanics Lab	0	0	3	3		ME 372	Heat Transfer and Metrology Lab	0	0	3	3	
<b>Total</b>					<b>30</b>		<b>Total</b>					<b>30</b>	
COURSES FOR HONOR REQUIREMENT							COURSES FOR HONOR REQUIREMENT						
							ME	Course 1	3	0	0	6	
COURSES FOR MINOR REQUIREMENT							COURSES FOR MINOR REQUIREMENT						
ME	Thermodynamics	2	1	0	6		ME 333	Manufacturing Processes I	2	1	0	6	

COURSE CURRICULUM FOR THE NEW PROGRAMME (B.Tech.) w.e.f. 2007 BATCH											
Semester VII						Semester – VIII					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
ME 423	Machine Design	2	1	2	8		Departmental Elective III	3	0	0	6
ME 401	Microprocessors and Automatic Control	2	1	0	6		Departmental Elective IV	3	0	0	6
	Departmental Elective II	3	0	0	6		Departmental Elective V	3	0	0	6
	Institute Elective I	3	0	0	6		Departmental Elective VI	3	0	0	6
ME 441	Applied Thermodynamics Lab	0	0	3	3		Institute Elective II	3	0	0	6
ME 421	Microprocessors and Automatic Control Lab	0	0	3	3						
Total32						Total30					
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					
ME	Course 2	3	0	0	6	ME 496	Project (Stage 2)	0	0	0	12
ME 494	Project (Stage 1)	0	0	0	6						
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT					
ME 338	Manufacturing Processes II	2	1	0	6	ME 316	Kinematics and Dynamics of Machines	2	1	0	6

### Important Instructions and List of Electives for B.Tech.

- B.Tech. program consists of 255 credits including 36 credits (for 6 electives).
- Each student must select any 6 courses from the elective list I to IV given below.

- (iii) Honors can be earned by completing 2 electives (12 credits) and an 18-credit project. The project, guide and the electives must be decided by the end of semester V. The project should be taken up in the semesters VII and VIII. 2 electives must be slanted towards the project and decided in consultation with the project guide from the list of department electives I to VI given below.

### **Department Electives I to VI**

- 1) ME 340 Analytical Methods in Engineering
- 2) ME 348 Computer Aided Solution
- 3) ME 350 Refrigeration and Air-Conditioning
- 4) ME 356 Mechanization
- 5) ME 360 Power Plant Engineering
- 6) ME 366 Experimental Stress Analysis
- 7) ME 403 Internal Combustion Engines
- 8) ME 406 Steam and Gas Turbines
- 9) ME 408 Industrial Engineering and Operations Research II
- 10) ME 410/758 Microfluidics
- 11) ME 415 Computational Fluid Dynamics and Heat Transfer
- 12) ME 427 Design for Fatigue and Fracture
- 13) ME 440 Industrial Tribology
- 14) ME 445 Fuels and Combustion
- 15) ME 450 Vibration and Noise Control
- 16) ME 456 Automobile Engineering (Transmission)
- 17) ME 472 Non Linear Dynamics and Chaos
- 18) ME 477 Introduction to Optimization
- 19) ME 601 Stress Analysis

- 20) ME 602 Fatigue, Fracture and Failure Analysis \*
- 21) ME 603 Kinematics and Dynamics of Machinery
- 22) ME 604 Robotics
- 23) ME 606 Computer Aided Design of Machines
- 24) ME 607 Machine Design
- 25) ME 610 Applied Tribology
- 26) ME 613 Finite and Boundary Element Methods
- 27) ME 616 Fracture Mechanics \*
- 28) ME 617 Rapid Product Development
- 29) ME 618 Pressure Vessel Design
- 30) ME 621 Mathematical Methods for Applied Mechanics
- 31) ME 623 Cryogenics II
- 32) ME 639 Linear Systems Theory
- 33) ME 645 MEMS: Design, Fabrication and Characterization
- 34) ME 664 Advanced Finite and Boundary Element Methods
- 35) ME 662 Convective Heat and Mass Transfer
- 36) ME 663 Advanced Heat Transfer
- 37) ME 665 Conduction and Radiation Heat Transfer
- 38) ME 667 Industrial Noise Control
- 39) ME 669 Design for Manufacturing
- 40) ME 676 Collaborative Engineering
- 41) ME 678 Fundamentals of Gas Dynamics
- 42) ME 681 Thermal Environment Engineering
- 43) ME 683 Cryogenic I
- 44) ME 684 Air-Conditioning System Design

- 45) ME 704 Computational Methods in Thermal and Fluids Engineering
- 46) ME 714 Computer Integrated Manufacturing
- 47) ME 724 Essential of Turbulence
- 48) ME 730 Ultra Precision Machining
- 49) ME 732 Selected Application of AI & OR in Manufacturing Systems
- 50) ME 734 Vibro-Acoustics
- 51) ME 750 Sheet Metal Engineering
- 52) ME 754 Textile Machinery and Automation
- 53) ME 756 Numerical Modeling of Manufacturing Processes
- 54) ME 7XX Casting Design and Simulation
- 55) ME 7XX Science and Technology of Welding
- 56) ME 7XX Analysis of Metal Forming Processes
- 57) ME 7XX Advances in Material Removal Processes
- 58) EN 601 Non-Conventional Energy Sources
- 59) EN 604 Fuel Cells
- 60) EN 613 Nuclear Reactor Theory
- 61) EN 615 Wind Energy Conversion Systems
- 62) EN 616 Direct Energy Conversion
- 63) EN 618 Energy Systems Modeling & Analysis
- 64) EN 619 Solar Energy for Industrial Process Heat
- 65) EN 630 Utilization of Solar Energy
- 66) EN 634 Nuclear Reactor Thermal Hydraulics and Safety
- 67) EN 640 Solar Photovoltaic: Fundamentals, Technologies and Applications
- 68) EN 642 Power Generation and Systems Planning
- 69) IE 601 Deterministic Models of Optimization and Operations Research

- 70) IE 603 Discrete Event System Simulation
- 71) IE 611 Introduction to Stochastic Models
- 72) IE 612 Introduction to Financial Engineering
- 73) IE 642 Engineering Economic Analysis
- 74) IE 645 Industrial Scheduling
- 75) IE 646 Quality Engineering and Management Systems
- 76) IE 647 Applied Integer Programming
- 77) IE 651 Inventory Control and Management Systems
- 78) IE 604 System Dynamics Modeling and Analysis
- 79) IE 702 Neural Networks, Fuzzy Systems and Applications
- 80) IE 703 Introduction to Knowledge Based Systems and Applications
- 81) IE 704 Selected Applications of AI in Operations Research
- 82) IE 705 Quantitative Methods in Project Management
- 83) IE 706 Pricing and Revenue Management
- 84) IE 707 Multi-Player Decision Making Models
- 85) IE 708 Markov Decision Processes
- 86) IE 710 O.R. Applications in Infrastructure & Service Sectors
- 87) IE 712 Selected Applications of Stochastic Models
- 88) IE 714 Quantitative Models for Supply Chain Management

\* Students are permitted to register for only one of these two (ME 602 and 616) courses.

### **List of Courses for Minor in Mechanical Engineering**

A student can be awarded a minor in Mechanical Engineering provided he completes any five of the following courses.



- 1) Solid Mechanics (ME 201)
- 2) Thermodynamics (ME 209)
- 3) Fluid Mechanics (ME 203)
- 4) Kinematics and Dynamics of Machines (ME 418)
- 5) Manufacturing Processes I (ME 333)
- 6) Manufacturing Processes II (ME 338)