## SYLLABUS FOR CREDIT BASED CURRICULUM (For Students Admitted in 2013 – 2014)



# B. TECH. DEGREE MECHANICAL ENGINEERING



DEPARTMENT OF MECHANICAL ENGINEERING NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI - 620 015 INDIA

**JULY 2014** 

### DEPARTMENT OF MECHANICAL ENGINEERING B.Tech. SYLLABUS (Revised)

For the Students Joining III Semester in 2014

The total credits required for completing the B.Tech. Programme in Mechanical Engineering is 183.

#### **SEMESTER III**

CODE	COURSE OF STUDY	L	T	P	C		
MA211	Special Functions and Statistics	3	0	0	3		
EE223	Applied Electrical Engineering	2	0	2	3		
EC217	Applied Electronics Engineering	2	0	2	3		
PR221	Production Technology - I	3	0	0	3		
ME203	Engineering Thermodynamics	3	1	0	4		
ME205	Strength of Materials	3	0	0	3		
Practical							
ME211	Machine Drawing	0	0	6	2		
ME213	Strength of Materials Lab	0	0	2	1		
	Total	16	1	12	22		
	SEMESTER IV						
CODE	COURSE OF STUDY	L	T	P	C		
CODE MA208	Fourier Series and Partial Differential	<b>L</b> 3	<b>T</b> 0	<b>P</b> 0	<b>C</b> 3		
	Fourier Series and Partial Differential Equations	_					
MA208	Fourier Series and Partial Differential Equations Engineering Metallurgy	3	0	0	3		
MA208 MT252	Fourier Series and Partial Differential Equations	3	0	0	3		
MA208 MT252 PR222	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II	3 3 3	0 0 0	0 0 0	3 3 3		
MA208 MT252 PR222 ME202	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II Thermal Engineering	3 3 3 3	0 0 0 0	0 0 0 0	3 3 3 3		
MA208 MT252 PR222 ME202 ME204	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II Thermal Engineering Mechanics of Machines - I	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3 4		
MA208 MT252 PR222 ME202 ME204 ME206	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II Thermal Engineering Mechanics of Machines - I Fluid Mechanics Metallurgy Lab	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3 4		
MA208 MT252 PR222 ME202 ME204 ME206  Practical	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II Thermal Engineering Mechanics of Machines - I Fluid Mechanics  Metallurgy Lab Production Process Lab	3 3 3 3 3 3	0 0 0 0 1 1	0 0 0 0 0 0	3 3 3 4 4 1 2		
MA208 MT252 PR222 ME202 ME204 ME206  Practical MT262 PR232 ME208	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II Thermal Engineering Mechanics of Machines - I Fluid Mechanics  Metallurgy Lab Production Process Lab Thermal Engineering Lab - I	3 3 3 3 3 3	0 0 0 0 1 1 0 0	0 0 0 0 0 0	3 3 3 4 4 4		
MA208 MT252 PR222 ME202 ME204 ME206  Practical MT262 PR232	Fourier Series and Partial Differential Equations Engineering Metallurgy Production Technology - II Thermal Engineering Mechanics of Machines - I Fluid Mechanics  Metallurgy Lab Production Process Lab	3 3 3 3 3 3 0 0	0 0 0 0 1 1	0 0 0 0 0 0	3 3 3 4 4 1 2		

#### SEMESTER V

CODE	COURSE OF STUDY	L	T	P	C
MA301	Numerical Methods	3	0	0	3
ME 303	Heat and Mass Transfer	3	0	0	3
ME 305	Mechanics of Machines - II	3	1	0	4
ME 307	Analysis and Design of Machine Components	3	0	0	3
ME 309	Mechatronics	3	0	0	3
ME 3E1	Elective – I	3	0	0	3
<b>Practical</b>					
ME 311	Mechatronics Lab	0	0	2	1
ME 313	Dynamics Lab	0	0	3	2
ME 315	Production Drawing and Cost Estimation	1	0	2	2
	Total	19	1	7	24
	SEMESTER VI				
CODE	COURSE OF STUDY	L	T	P	C
ME302	Turbomachines	3	0	0	3
ME304	Automobile Engineering	3	0	0	3
ME306	Design of Mechanical Drives	3	0	0	3
ME308	Computer Aided Design and Drafting	3	0	0	3
ME3E2	Elective – II	3	0	0	3
ME3E3	Elective – III	3	0	0	3
	Industrial Lectures				1
	Internship/Ind. Training/Academic Attachment				2
Practical					
ME312	Thermal Engineering Lab II	0	0	3	2
ME314	Automobile Engineering Lab	0	0	3	2
	Computer Aided Design and Drafting	_			
ME316	Practice	0	0	2	1
	Total	18	0	8	26

#### SEMESTER VII

CODE	COURSE OF STUDY	L	T	P	C
HM401	Industrial Economics	3	0	0	3
ME403	Power Plant Engineering	3	0	0	3
ME405	Metrology and Quality Control	3	0	0	3
ME407	Finite Element Method	3	0	0	3
ME4E4	Elective – IV	3	0	0	3
ME4E5	Elective – V	3	0	0	3
Practical					
ME409	Metrology Lab	0	0	2	1
ME411	Comprehensive Viva-voce	0	3	0	3
ME413	Project Work Phase – I	0	1	0	0
	Total	18	4	2	22
	SEMESTER VIII				
CODE	COURSE OF STUDY	L	T	P	C
HM402	Management Principles and Concepts	3	0	0	3
ME4E6	Elective – VI	3	0	0	3
ME4E7	Elective – VII	3	0	0	3
ME4E8	Elective – VIII	3	0	0	3
ME410	Project Work Phase – II	0	0	15	6
	Total	12	0	15	18
Credits for I	Year			- 45	5
Credits for N	Mechanical Engineering (III to VIII Semester)			- 138	3
Total Credit				- 183	

#### **LIST OF ELECTIVES**

#### **ELECTIVE STREAM 1: THERMAL ENGINEERING**

CODE	COURSE OF STUDY	${f L}$	T	P	C
ME001	Compressible Flow and Jet Propulsion	3	0	0	3
ME002	Computational Fluid Dynamics	3	0	0	3
ME003	Advanced IC Engines	3	0	0	3
ME004	Combustion Engineering	3	0	0	3
ME005	Renewable Energy	3	0	0	3
ME006	Biofuels	3	0	0	3
ME007	Fundamentals of HVAC Systems	3	0	0	3
ME008	Cryogenic Engineering	3	0	0	3
ME009	Nanotechnology	3	0	0	3
ME010	Vehicle Dynamics	3	0	0	3

#### **ELECTIVE STREAM 2: ENGINEERING DESIGN**

CODE	COURSE OF STUDY	L	T	P	C
ME021	Computer Applications in Design	3	0	0	3
ME022	Advanced Tool Design	3	0	0	3
ME023	Finite Element Method	3	0	0	3
ME024	Design of Gears and Cams	3	0	0	3
ME025	Optimization in Engineering Design	3	0	0	3
ME026	Dynamics of Machinery	3	0	0	3
ME027	MEMS Devices – Design and Fabrication	3	0	0	3
ME028	Composite Materials	3	0	0	3
ME029	Advanced Engineering Materials	3	0	0	3
ME030	Vibration Analysis and Control	3	0	0	3

#### **ELECTIVE STREAM 3: MANUFACTURING**

CODE	COURSE OF STUDY	L	T	P	C
ME041	Tool Engineering and Design	3	0	0	3
ME042	Advances in Welding Technology	3	0	0	3
ME043	Advanced Metal Forming Techniques	3	0	0	3
ME044	Lean Manufacturing and Six Sigma	3	0	0	3

ME045	Rapid Manufacturing Processes	3	0	0	3
ME046	Advanced Materials Technology	3	0	0	3
ME047	Advanced Machining Processes	3	0	0	3
ME048	Industrial Safety	3	0	0	3
ME049	Oil Hydraulics and Pneumatics	3	0	0	3
ME050	Industrial Robotics	3	0	0	3
ME051	Mechatronics and Instrumentation	3	0	0	3
ME052	Advances in Manufacturing Technology	3	0	0	3

#### LIST OF B.TECH. HONOURS ELECTIVES

CODE	COURSE OF STUDY	L	T	P	C
ME091	Advanced Thermodynamics	3	0	0	3
ME092	Advanced Heat Transfer	3	0	0	3
ME093	Advanced Fluid Mechanics	3	0	0	3
ME094	Advanced Finite Element Analysis	3	0	0	3
ME095	Advanced Optimization Techniques	3	0	0	3
ME096	Simulation of IC Engines	3	0	0	3
ME097	Design and Analysis of Turbo Machines	3	0	0	3
ME098	Advanced Mechanics of Materials	3	0	0	3
ME099	Advanced Metrology and Computer Aided Inspection	3	0	0	3
ME100	Fuzzy Logic and Neural Networks	3	0	0	3

#### SUBJECTS OFFERED TO OTHER DEPARTMENTS

CODE	COURSE OF STUDY	L	T	P	C
CE282	Fluid Mechanics and Machinery	3	0	0	3
ME325	Thermal Engineering	3	0	0	3
ME 331	Fluid Machinery and Thermal Engg. Lab	0	0	3	2
ME471	Automobile Engineering	3	0	0	3
ME 231	Thermal Engineering	3	0	0	3
CE285	Thermodynamics & Fluid Mechanics Lab	0	0	3	2
ME297	Mechanical Technology	3	0	0	3