

13. Courses of Study and Scheme of Assessment

BE MECHANICAL ENGINEERING (SANDWICH)

(2015 REGULATIONS)
(Minimum credits to be earned: 185)

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER I									
15M101	Calculus and its Applications	3	2	0	4	50	50	100	BS
15M102	Physics	3	0	0	3	50	50	100	BS
15M103	Chemistry	3	0	0	3	50	50	100	BS
15M104	English Language Proficiency	2	2	0	3	50	50	100	HS
15M106	Concepts of Engineering Design & Environmental Issues	3	0	0	3	50	50	100	ES
15M110	Engineering Graphics I	1	0	4	3	100	-	100	ES
15M111	Physics Laboratory I	0	0	2	1	100	-	100	BS
15M112	Chemistry Laboratory I	0	0	2	1	100	-	100	BS
15M100	Industrial Training I	0	0	10	5%	100*	-	100	PC
15M214	Personality and Character Development	0	0		Refer sem 2 and footnote				MC
Total 27 hrs		15	4	8+10	21+5%	500	200	700	
SEMESTER II									
15M105	Problem Solving and C Programming	2	2	0	3	50	50	100	ES
15M201	Complex Variables and Transforms	3	2	0	4	50	50	100	BS
15M204	Material Science	3	0	0	3	50	50	100	BS
15M205	Chemistry of Engineering Materials	3	0	0	3	50	50	100	BS
15M210	Engineering Graphics II	1	0	4	3	100	-	100	ES
15M211	Physics Laboratory II	0	0	2	1	100	-	100	BS
15M212	Chemistry Laboratory II	0	0	2	1	100	-	100	BS
15M200	Industrial Training II	0	0	10	5%	100*	-	100	PC
15M214	Personality and Character Development	0	0	**	Grade	-	-	-	MC
Total 24 hrs		12	4	8+10	18+5%	600	200	800	

** - Total 40 hrs in I & II semesters put together. Grade: Completed / Not Completed

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SEMESTER II – Summer Term[€]									
15M215	Professional Skills	6	0	9	2	100 [€]	-	100	EEC
15M216	In-Plant Training and Technical Seminar	6	0	9	2	100 [€]	-	100	EEC
Total 30 hrs		12	0	18	4	200	-	200	

CA - Continuous Assessment

FE - Final Examination

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€ - These courses will be conducted prior to the commencement of the third semester for a period of 4 weeks during summer term.

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SEMESTER III									
15M202	Engineering Mechanics	3	2	0	4	50	50	100	ES
15M203	Industrial Psychology, Sociology and Work Ethics	2	0	0	2	50	50	100	HS
15M301	Numerical Methods	2	2	0	3	50	50	100	BS
15M304	Manufacturing Processes I	3	0	0	3	50	50	100	PC
15__	Language Elective	3	0	0	3	50	50	100	HS
15M410	Machine Drawing	0	0	4	2	100	-	100	PC
15M113	Engineering Practices	0	0	2	1	100	-	100	ES
15M300	Industrial Training III	0	0	10	5%	100*	-	100	PC
Total 23 hrs		13	4	6+10	18+5%	550	250	800	

SEMESTER IV									
15M302	Fluid Mechanics	2	2	0	3	50	50	100	ES
15M303	Mechanics of Materials	2	2	0	3	50	50	100	ES
15M402	Basics of Electrical and Electronics Engineering	3	0	0	3	50	50	100	ES
15M403	Manufacturing Processes II	3	0	0	3	50	50	100	PC
15M504	Industrial Metallurgy	3	0	0	3	50	50	100	ES
15M310	Manufacturing Process Laboratory	0	0	4	2	100	-	100	PC
15M311	Fluid Machinery Laboratory	0	0	4	2	100	-	100	PC
15M411	Electrical and Electronics Engineering Laboratory	0	0	2	1	100	-	100	ES
15M400	Industrial Training IV	0	0	10	5%	100*	-	100	PC
Total 27 hrs		13	4	10+10	20+5%	650	250	900	

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Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER V									
15M305	Kinematics of Machinery	3	2	0	4	50	50	100	PC
15M306	Engineering Thermodynamics	3	2	0	4	50	50	100	PC
15M401	Probability and Statistics	2	2	0	3	50	50	100	BS
15M505	Turbomachinery	2	2	0	3	50	50	100	PC
15_____	Open Elective I*	3	0	0	3	50	50	100	OE
15M510	Material Science and Mechanics of Materials Laboratory	0	0	4	2	100	-	100	ES
15M213	In-Plant Training	0	0	2	1	100	-	100	EEC
15M500	Industrial Training V	0	0	10	5 [%]	100 ⁺	-	100	PC
Total 27 hrs		13	8	6+10	20+5 [%]	550	250	800	
SEMESTER VI									
15M404	Dynamics of Machinery	3	2	0	4	50	50	100	PC
15M501	Metrology and Instrumentation	3	0	0	3	50	50	100	PC
15M503	Thermal Engineering I	2	2	0	3	50	50	100	PC
15_____	Open Elective II*	3	0	0	3	50	50	100	OE
15M511	Thermal Engineering Laboratory	0	0	4	2	100	-	100	PC
15M610	Metrology and Dynamics Laboratory	0	0	4	2	100	-	100	PC
15M612	Innovation Practices	0	0	4	2	100	-	100	EEC
15M600	Industrial Training VI	0	0	10	5 [%]	100 ⁺	-	100	PC
Total 27 hrs		11	4	12+10	19+5 [%]	600	200	800	

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* – LTPC for open electives can be either 3 0 0 3 or 2 2 0 3.

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Code No.	Course	Hours / week				Maximum marks			
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SEMESTER VII									
15M405	Thermal Engineering II	2	2	0	3	50	50	100	PC
15M502	Design of Machine Elements	2	2	0	3	50	50	100	PC
15M703	Tool Design	2	2	0	3	50	50	100	PC
15_____	Open Elective III*	3	0	0	3	50	50	100	OE
15M710	Computer Aided Engineering Laboratory	0	0	4	2	100	-	100	PC
15M711	Pneumatic automation and Sensorics Laboratory	0	0	4	2	100	-	100	PC
15M700	Industrial Training VII***	0	0	10	5%	100*	-	100	PC
Total 23 hrs		9	6	8+10	16+5%	500	200	700	

SEMESTER VIII

15M601	Design of Transmission Systems	2	2	0	3	50	50	100	PC
15M602	Heat and Mass Transfer	2	2	0	3	50	50	100	PC
15M603	Design for Manufacture and Assembly	2	2	0	3	50	50	100	PC
15M604	Operations Research	2	2	0	3	50	50	100	PC
15M____	Professional Elective I	3	0	0	3	50	50	100	PE
15M611	Heat Transfer Laboratory	0	0	4	2	100	-	100	PC
15M800	Industrial Training VIII	0	0	10	5%	100*	-	100	PC
Total 23 hrs		11	8	4+10	17+5%	450	250	700	

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*** - Students will undergo the course work and /or training in an industry immediately after the 6th semester examinations for a period of 3 months and study the remaining courses of the VII Semester after completing these components.

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SEMESTER IX									
15M701	Computer Numerical Control and Robotics	3	2	0	4	50	50	100	EEC
15M702	Power Plant Engineering	3	0	0	3	50	50	100	PC
15M___	Professional Elective II	3	0	0	3	50	50	100	PE
15M___	Professional Elective III	3	0	0	3	50	50	100	PE
15M___	Professional Elective IV	3	0	0	3	50	50	100	PE
15M900	Industrial Training IX	0	0	10	5 [%]	100 [*]	-	100	PC
15M720	Project Work I	0	0	4	2	100	-	100	EEC
Total 21 hrs		15	2	4+10	18+5 [%]	450	250	700	

SEMESTER X

15M___	Professional Elective V	3	0	0	3	50	50	100	PE
15M___	Professional Elective VI	3	0	0	3	50	50	100	PE
15M820	Project Work II	0	0	16	8	50	50	100	EEC
Total 22 hrs		6	0	16	14	150	150	300	

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LANGUAGE ELECTIVES

15M080	Communication Skills for Engineers
15M081	Basic German
15M082	Basic French
15M083	Basic Japanese

OPEN ELECTIVES

(Students can opt for all open electives from single stream or several streams)

MATHEMATICS

15OH01	Advanced Linear Algebra
15OH02	Algebraic Structures
15OH03	Calculus of Variations and Tensor Analysis
15OH04	Graph Theory and its Applications
15OH05	Mathematical Finance
15OH06	Mathematical Modeling and Simulation
15OH07	Number Theory for Computing
15OH09	Reliability and Quality Control
15OH10	Soft Computing
15OH11	Stochastic Models

PHYSICS

15OH20	Analytical Techniques for Materials Characterization
15OH21	Laser Technology
15OH22	Micro Electromechanical Systems
15OH23	Nanomaterials and Applications
15OH24	Physics for Solar PV Systems and Solid-State Lighting Systems
15OH25	Sensors for Engineering Applications
15OH26	Thin Film Technology
15OH27	Nonlinear Science and Engineering Applications
15OH28	Nonlinear Fiber Optics
15OH29	Chaotronics

CHEMISTRY

15OH36	Corrosion Science and Engineering
15OH37	Energy Storing Devices and Fuel Cells
15OH41	Polymer Science and Technology

COMPUTER APPLICATIONS

15OH46	Computer Graphics and Virtual Reality
15OH47	Data and File Structures
15OH48	Database Management System
15OH49	High Performance Computing
15OH50	Mainframe Systems
15OH51	Mobile Application Development
15OH52	Multicore Programming
15OH53	Object Oriented Programming
15OH54	Programming in Python
15OH55	Responsive Web Design
15OH56	Social Web Mining
15OH57	Software Engineering
15OH58	Java Programming
15OH59	Geographic Information System
15OH60	Programming for Robotics

HUMANITIES

15OH61	An Introduction to Indian Constitution
15OH62	Entrepreneurship
15OH63	Human Resource Management
15OH64	Industrial Psychology
15OH65	Principles of Management

15OH66	Business Statistics
15OH67	Disaster Management
15OH68	Financial and Managerial Accounting
15OH69	Marketing Management
15OH70	Defence Practices and Disaster Management

ENGLISH

15OH75	English and Soft Skills for Employability
15OH76	English for Competitive Examinations
15OH77	German Language – International Level A1.1
15OH78	German Language – International Level A1.2

APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES

15OH81	Data Structures and Algorithms
15OH82	Optimization Techniques
15OH83	Data Science
15OH84	Data Visualization
15OH85	Artificial Intelligence
15OH86	Pervasive Computing
15OH87	Parallel and Distributed Computing
15OH88	Cyber Security
15OH89	Randomized Algorithms
15OH90	Approximation Algorithms

OPEN ELECTIVES OFFERED BY ENGINEERING DEPARTMENTS

15AH01	Automotive Infotronics	(Dept. of Automobile Engineering)
15AH03	Electric and Hybrid Vehicles	(Dept. of Automobile Engineering)
15PH08	Foundation Skills in Integrated Product Development	(Dept. of Production Engineering)
15TH02	Sound and Thermal Isolation Products and Characterization	(Dept. of Textile Technology)

PROFESSIONAL ELECTIVES OFFERED BY THE DEPARTMENT

DESIGN STREAM

15M001	Computer Aided Design
15M002	Advanced Strength of Materials
15M003	Finite Element Analysis
15M004	Failure Analysis and Design
15M005	Vibration and Noise Engineering
15M006	Design of Rotating Equipments
15M007	Theory of Elasticity and Plasticity
15M008	Mechanics of Composite Materials
15M009	Introduction to Aircraft Industry and Aircraft Systems
15M010	Design of Aircraft Systems
15M011	System Modeling and Control
15M012	Precision Machine Design
15M013	Biomechanics

MANUFACTURING STREAM

15M020	Computer Integrated Manufacturing
15M021	Manufacture and Inspection of Gears
15M022	Hydraulic and Pneumatic Systems
15M023	Non- Traditional Machining
15M024	Rapid Prototyping
15M025	Flexible Manufacturing Systems
15M026	Design and Analysis of Automated Systems
15M053	Solid State Joining Processes

THERMAL AND FLUID STREAM

15M030	Computational Fluid Dynamics
15M031	IC Engine Design
15M032	Refrigeration and Air-conditioning
15M033	Biogas Engineering
15M034	Automobile Engineering
15M035	Automotive Electronics
15M036	Advanced Fluid Dynamics
15M037	Renewable Energy
15M038	Solar Energy Conversion Systems and Design
15M039	Energy Conservation and Management
15M051	Advanced Heat and Mass Transfer
15M054	Energy and Climate Change

INDUSTRIAL ENGINEERING STREAM

15M040	Lean Manufacturing
15M041	Value Analysis and Value Engineering
15M042	Supply Chain Management
15M043	Industrial Design and Applied Ergonomics
15M044	Optimization Techniques for Engineering Systems
15M045	Quality Engineering
15M046	Managerial Finance
15M047	Engineering Economic Analysis
15M048	Industrial Management
15M049	Enterprise Resource Planning
15M050	Six Sigma in Manufacture and Service
15M052	Quality Management

ONE CREDIT COURSES

OFFERED BY THE DEPARTMENT

15MF01	Process Engineering and Costing
15MF02	Strategic and Human Resources Management
15MF03	Measurement of Vibration and Sound
15MF04	Challenges in Implementing Lean Manufacturing
15MF05	Computational Fluid Flow and Heat Transfer Analysis of Mechanical Systems
15MF06	Thermal Analysis of Mechanical Systems using Finite Element Method
15MF07	Creative and Innovative Methods for Design and Development
15MF08	Concepts of Product Design
15MF09	Cooling of Electronic Equipment
15MF10	Value Analysis and Value Engineering
15MF11	Air Conditioning System
15MF12	Skills Development for Creativity and Innovation
15MF13	Corrosion Science and Engineering
15MF14	Simulators for Integrated Products
15MF15	Overview of Digital Manufacturing

OFFERED BY HUMANITIES

15OF01	Export – Import Management
15OF02	Insurance & Risk Management
15OF03	Values and Ethics at Work Place
15OF04	Development of Industrialisation
15OF05	Creativity and Social Enterprise
15OF06	Social and Psychological Well Being
15OF13	Security Analysis and Portfolio Management
15OF14	Implementation of Quality Management System
15OF15	Financial Management
15OF16	Personality Development Through Transactional Analysis

OFFERED BY THE DEPARTMENT OF ENGLISH

15OF10 Corporate Communication
 15OF11 Interpersonal and Organizational Communication
 15OF12 Human Values Through Literature

OFFERED BY THE DEPARTMENT OF MATHEMATICS

15OF21 Principles of Business Analytics

B.E MECHANICAL ENGINEERING (SW)														
S. No.	Course Work subject Area	Credits Per Semester										Total Credit	Credit Range	
		I	II	III	IV	V	VI	VII	VIII	IX	X		Min	Max
1	HS	3	0	5	0	0	0	0	0	0	0	8	9	18
2	BS	12	12	3	0	3	0	0	0	0	0	30	27	36
3	ES	6	6	5	13	2	0	0	0	0	0	32	27	36
4	PC	0+5%	0+5%	5+5%	7+5%	11+5%	14+5%	13+5%	14+5%	3+5%	0	67	54	72
5	PE	0	0	0	0	0	0	0	3	9	6	18	18	27
6	OE	0	0	0	0	3	3	3	0	0	0	9	9	18
7	EEC	0	0+4*	0	0	1	2	0	0	6	8	17+4*	18	27
	Total	21+5%	18+4*+5%	18+5%	20+5%	20+5%	19+5%	16+5%	17+5%	18+5%	14	181+4*		

* Summer Term

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