



SCHEME OF STUDIES & EXAMINATIONS
Department: Mechanical Engineering – 6th Semester

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	ME 302B	DYNAMICS OF MACHINES	3	1		25	75	-	100	4	3
2	ME 304B	MACHINE DESIGN-II	3	2		25	75	-	100	5	3
3	ME 306B	HEAT TRANSFER (ME, AER)	4	1		25	75	-	100	5	3
4	ME 308B	AUTOMATIC CONTROL	3	1		25	75	-	100	4	3
5	ME 310B	MEASUREMENTS & INSTRUMENTATION	3	1		25	75	-	100	4	3
6	ME 312B	INDUSTRIAL ENGINEERING (ME, AER)	3	1		25	75	-	100	4	3
7	ME 314B	DYNAMICS OF MACHINES LAB	-	-	2	20		30	50	1	3
8	ME 316B	HEAT TRANSFER LAB (ME, AER)	-	-	2	20		30	50	1	3
9	ME 318B	MEASUREMENT & INSTRUMENTATION LAB	-	-	2	20		30	50	1	3
10	HUM 302 B	Report Writing SKILLS (Common for all branches)	1	-	-	25	50		75	1	2
11	HUM 304 B	ORAL PRESENTATION SKILLS (Common for all branches)	-	-	2	20	-	30	50	1	2
12	GPME 302B	GENERAL PROFICIENCY & ETHICS	1	-	-	-	-	75	75	2	-
Total			21	7	8	255	500	195	950	33	

Note:

- Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Sports is given in General Proficiency Syllabus.
- The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
- Electronics gadgets including Cellular phones are not allowed in the examination
- Each students has to undergo Professional Training of at least 4 weeks from the industry, institute, research lab, training center etc during summer vacation and its evaluation shall be carries out in the VII semester



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Dynamics Of Machines(Theory)

Subject Code: ME 302B

Detailed Contents

UNIT I Static And Dynamic Force Analysis, Turning Moment And Flywheel

- Topic no 1: Static force analysis in four-bar mechanism and slider crank mechanism
- Topic no 2: Internal force analysis, Inertia force in four-bar mechanism
- Topic no 3: Combined static and dynamics force analysis in slider-crank mechanism, Problem
- Topic no 4: Turning moment on crankshaft,
- Topic no 5: Turning moment diagrams-single cylinder double acting steam engine,
- Topic no 6: four stroke IC engine and multi-cylinder steam engine,
- Topic no 7: Fluctuation of energy, Flywheel, Problems.

UNIT II Balancing Of Rotating Components, Balancing Of Reciprocating Parts

- Topic no 8: Static balance, Dynamic balance, Balancing of rotating masses
- Topic no 9: Two plane balancing, Graphical and analytical methods
- Topic no 10: Balancing machines-static balancing and dynamic balancing machines, Field balancing, Problems
- Topic no 11: Primary and secondary forces and couples
- Topic no 12: Partial balancing, Effects of partial balancing
- Topic no 13: Balancing of single cylinder engine, balancing of multi cylinder; inline; radial engines, firing order

UNIT III Governors,Gyroscope

- Topic no 14: Terminology, Centrifugal governors-Watt governor, Dead weight governors-Porter & Proell governor
- Topic no 15: Spring controlled governor-Hartnell governor, Sensitivity, Stability, Hunting
- Topic no 16: Isochronism, Effort and Power of governor
- Topic no 17: Controlling force diagrams for Porter governor and Spring controlled governors
- Topic no 18: Precession angular motion and gyroscopic couple and their effects on aeroplane, ship during steering
- Topic no 19: rolling and pitching, Stability of two wheel and four wheel vehicles moving on curved paths, Problems.

UNIT IV Brake And Dynamometers, Inertia Forces In Reciprocating Parts

- Topic no 20: Types of brakes- external shoe brakes, band brakes, band and block brakes
- Topic no 21: Braking of vehicle, Types of dynamometers-Prony brake, rope brake dynamometers
- Topic no 22: Belt transmission dynamometer, torsion dynamometer, Problems
- Topic no 23: Forces on reciprocating parts of an engine neglecting the weight of connecting rod, Crankshaft torque
- Topic no 24: Dynamically equivalent system-analytical and graphical method, Correction couple, Problems

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

Text Books:

1. Theory of Mechanisms and Machines: Amitabha Ghosh and Ashok kumar Mallik, Third Edition Affiliated East-West Press.
2. Theory of Machines and Mechanisms: Joseph Edward Shigley and John Joseph Uicker, Jr. Second Edition, MGH, New York.

Reference Books:

1. Mechanism and Machine Theory: J.S. Rao and R.V. Dukkupati Second Edition New age International
2. Theory of Machines: Thomas Beven.
3. Theory and Machines: S.S. Rattan, Tata McGraw Hill.



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Machine Design –II (Theory)

Subject Code: ME 304B

Detailed Content

UNIT I Design Aspects, Variable Loading

- Topic no 1: Ergonomic and value engineering
- Topic no 2: Considerations in design, design for manufacturability
- Topic no 3: Assembly, interchangeability
- Topic no 4: Statistical consideration in design
- Topic no 5: Considerations for casting, forging and machining
- Topic no 6: Different types of fluctuating/ variable stresses,
- Topic no 7: Fatigue strength considering stress concentration factor, surface factor, size factor, reliability factor etc.
- Topic no 8: Fatigue design for finite and infinite life Goodman and Soderberg's Criterion
- Topic no 9: Fatigue design using Miner's equation, Problems

UNIT II Shafts, Springs

- Topic no 10: Detailed design of shafts for static and dynamic loading
- Topic no 11: Rigidity and deflection consideration
- Topic no 12: Types of Springs
- Topic no 13: Design for helical springs against tension and their uses, compression and fluctuating loads
- Topic no 14: Design of leaf springs, Surging in springs, Design Problem

UNIT III Bearings

- Topic no 15: Classification, Design of pivot and collar bearing
- Topic no 16: Selection of ball and roller bearing based on static and dynamic load carrying capacity, load-life relationship
- Topic no 17: Selection of Bearings from manufacturer's catalogue
- Topic no 18: Lubricants and their properties, Selection of lubricants
- Topic no 19: Types of lubrication – Boundary, mixed and hydrodynamic lubrication
- Topic no 20: Design of journal bearings using Raimondi and Boyd's Charts
- Topic no 21: Design Problems

UNIT IV Gears

- Topic no 22: Classification, Selection of gears
- Topic no 23: Terminology of gears, Force analysis
- Topic no 24: Selection of material for gears, Beam & wear strength of gear tooth
- Topic no 25: Form or Lewis factor for gear tooth
- Topic no 26: Dynamic load on gear teeth -Barth equation and Buckingham equation and their comparison
- Topic no.27 Design of spur, helical, bevel & worm gear including the Consideration for maximum power transmitting capacity Gear Lubrication, Design Problems

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

Text Books :

1. Mechanical Engg. Design, Joseph Edward Shigley, McGraw Hill Book Co.
2. Design of Machine Elements, V.B. Bhandari, Tata McGraw Hill, New Delhi.
3. Engineering design – George Dieter, McGraw Hill, New York.
4. Product Design and Manufacturing, A.K.Chitale and R.C.Gupta, PHI, New Delhi.
5. Machine Design An Integrated Approach: Robert L.Norton, Addison Wisley Longman
6. Design of machine elements-C S Sharma, Kamlesh Purohit, PHI.
7. PSG design data book



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Heat Transfer (Theory)

Subject Code ME306B

Detailed Content

Unit No.1 Basics Concepts, Steady State Heat Conduction

- Topic No.1: Thermodynamics Vs Heat transfer
- Topic No.2: Define Heat Transfer, thermal conductivity Vs diffusivity
- Topic No.3: Basic modes of heat transfer
- Topic No.4: Combined heat transfer
- Topic No.5: Introduction, 1-D heat conduction through a plane wall
- Topic No.6: Long hollow cylinder
- Topic No.7: Hollow sphere
- Topic No.8: Conduction equation in Cartesian co-ordinate systems
- Topic No.9: Conduction equation in Polar co-ordinate systems
- Topic No.10: Conduction equation in spherical co-ordinate systems

Unit No.2 Steady State Conduction With Heat Generation, Transient Heat Conduction (1-D):

- Topic No.11: Introduction, 1-D heat conduction with heat sources
- Topic No.12: Extended surfaces (fins)
- Topic No.13: Fins with uniform cross-sectional area
- Topic No.14: Fin effectiveness
- Topic No.15: Brief introduction of 2-D heat conduction
- Topic No.16: Lumped capacitance
- Topic No.17: Semi-infinite and infinite solid conduction modes for walls
- Topic No.18: Cylinders, spheres
- Topic No.19: Chart solution, Relaxation Method, Numericals

Unit No.3 Convection, Thermal Radiation

- Topic No.20: Forced convection
- Topic No.21: Thermal and hydro-dynamic boundary layers
- Topic No.22: Equation of continuity
- Topic No.23: Momentum and Energy equation
- Topic no.24: Internal flow through circular tube
- Topic No.25: External flow over a flat plate
- Topic No.26: Fluid friction and heat transfer (Colburn analogy
- Topic NO.27: Free convection from a vertical flat plate
- Topic No.28: Empirical relations for free convection from vertical and horizontal planes & cylinders, Numericals
- Topic No.29: Basic laws, Black body radiation
- Topic No.30: intensity and emissive power, diffuse and gray surfaces
- Topic No.31: Shape factors and network analogy
- Topic No.32: Radiation shields, applications to two and three surfaces

Unit No.4 Heat Exchangers, Heat Transfer With Change Of Phase

- Topic No.33: Classification, Performance variables
- Topic No.34: Analysis of a parallel/counter flow heat exchange
- Topic No.35: Heat exchanger effectiveness, pressure drop
- Topic No.36: Laminar film condensation on a vertical plate
- Topic No.37: Drop-wise condensation, Pool boiling regimes
- Topic No.38: Nucleate boiling and critical heat flux
- Topic No.39: Film boiling and minimum heat flux, Flow boiling



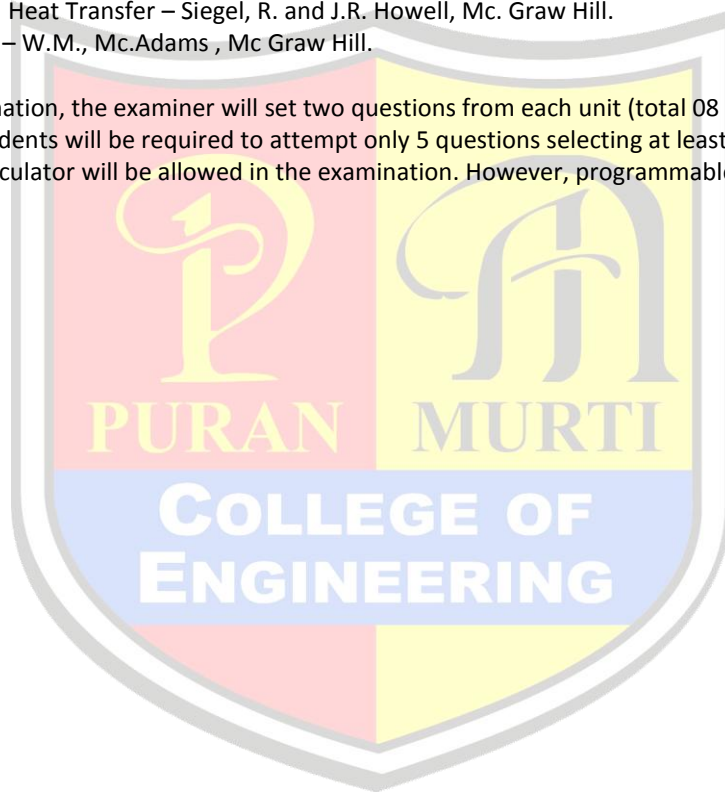
Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

Reference Books :

1. Heat Transfer – A. Bejan, John Wiley & Sons, Inc.
2. Conduction of Heat in Solids – Carslow, H.S. and J.C. Jaeger – Oxford Univ. Press.
3. Conduction Heat Transfer – Arpasi, V.S. – Addison – Wesley.
4. Compact Heat Exchangers – W.M. Keys & A.L. Landon, Mc. Graw Hill.
5. Thermal Radiation Heat Transfer – Siegel, R. and J.R. Howell, Mc. Graw Hill.
6. Heat Transmission – W.M., Mc.Adams, Mc Graw Hill.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.





SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Automatic Controls(Theory)

Subject Code: ME 308B

Detailed Content

UNIT-1 Introduction, Types Of Controllers

- Topic no 1 Types of control systems
- Topic no 2 Typical Block Diagram : Performance Analysis
- Topic no 3 Representation of Processes & Control Elements – Mathematical Modeling. Block Diagram Representation
- Topic no 4 Representation of Systems or Processes, Comparison Elements; Representation of Feedback Control systems – Block Diagram & Transfer Function Representation
- Topic no 5 Representation of a Temperature, Control System, Signal Flow Graphs, Mason’s Formula, Problems
- Topic no 6 Controllers; Pneumatic Types of Control Action; Proportional Controller
- Topic no 7 Integral Controller, Derivative Controller
- Topic no 8 On-off controller, PD, PID Controller
- Topic no 9 Hydraulic Controllers; Electronic Controllers; Problem

UNIT -II Transient And Steady State Response, Frequency Response Analysis

- Topic no 10 First order system; Unit Step, Unit Ramp and Unit Impulse Response of First Order system, Second Order System
- Topic no 11 Step Response of Second Order System, Delay Time, Rise Time, Peak Time, Settling Time
- Topic no 12 Introduction; Closed and Open Loop Transfer Function
- Topic no 13 Bode Diagram; Polar Plots; Rectangular Plots; Nichols Plots

UNIT-III Stability Of Control Systems:

- Topic no 14 Characteristic Equation; Routh’s Criterion; Nyquists Criterion, Problems
- Topic no 15 Root Locus Method : Introduction; Root Loci of a Second Order System
- Topic no 16 General Case; Rules for Drawing Forms of Root Loci
- Topic no 17 Relation between Root Locus Locations and Transient Response; Parametric Variation; Problems

UNIT-IV State Space Analysis Of Control Systems, Control Application

- Topic no 18 Introduction
- Topic no 19 Generalized State Equation; Techniques for Deriving System State – Space Equations
- Topic no 20 Transfer Function from State Equations; Solution of State Vector Differential Equations
- Topic no 21 Discrete Systems; Problems
- Topic no 22 Machine Tool Control
- Topic no 23 Hydraulic Control, NC/DNC/CNC Control system, Engine Governing
- Topic no 24 Mechanical Governors, Hydraulic Governors, Pneumatic Governors, Electronic Governors
- Topic no 25 Diesel Fuel Ignition Control

Study Scheme				Evaluation Scheme			Total Marks
L	T	P	Credits	Internal Assessment	External Assessment (Examination)		
				Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

- Theory & Applications of Automatic Controls by B.C. Nakra, Published by New Age International Pvt. Ltd. Publishers, New Delhi.
- Modern Control Engg. by Ugata, Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

- Automatic Control Systems by Kuo’ Published by Prentice Hall of India, New Delhi.
- Control System Engineering, I. J. Nagrath and M. Gopal, New Age , New Delhi.



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Measurements And Instrumentation (Theory)

Subject Code: ME 310B

Detailed Content

UNIT I Instruments And Their Representation, Basic Statistical Concepts

- Topic no 1: Introduction, Typical Applications of Instrument Systems
- Topic no 2: Functional Elements of a Measurement System
- Topic no 3: Classification of Instruments, Standards and Calibration
- Topic no 4: Types of Measured Quantities (Discrete and Continuous)
- Topic no 5: Central Tendency of Data, Mode, Median, Arithmetic Mean, Best Estimate of true Value of Data
- Topic no 6: Measures of Dispersion, Range, Mean Deviation, Variance, Standard Deviation, Normal Distribution, Central Limit Theorem, Significance Test
- Topic no 7: Method of Least Squares, Graphical Representation and Curve Fitting of Data

UNIT II Static And Dynamic Characteristics Of Instruments

- Topic no 8: Introduction, Accuracy, Precision, Resolution, Threshold, Sensitivity, Linearity, Hysteresis
- Topic no 9: Dead Band, Backlash, Drift, Formulation of Differential Equations for Dynamic Performance- Zero Order, First Order and Second order systems
- Topic no 10: Response of First and Second Order Systems to Step, Ramp, Impulse and Harmonic Functions

UNIT III Transducer, Intermediate And Recording Elements

- Topic no 11: Introduction, Types and Classification of Transducers, Selection of Transducers
- Topic no 12: Strain Gauges and Rosettes, Linear Variable Differential Transformer
- Topic no 13: Rotary Variable Differential Transformer; Piezo-electric Transducers
- Topic no 14: Optical Transducers and Opto-electric Transducers, Mechanical
- Topic no 15: Hydraulic and Pneumatic Amplifying elements, Compensators
- Topic no 16: Data Transmission Elements, Data Acquisition Systems, Data Display and Storage

UNIT IV Measurement Of Mechanical Quantities

- Topic no 17: Force Measurement: Hydraulic Load Cell, Pneumatic Load Cell
- Topic no 18: Elastic Force Devices, Separation of Force Components
- Topic no 19: Torque Measurement: Torque Reaction Methods and Torque Measurement Methods using Sensors
- Topic no 20: Pressure Measurement: Introductory Review of Moderate Pressure Measurement using Manometers and Elastic Elements; Vacuum Measurement using
- Topic no 21: McLeod, Pirani, Ionisation and Knudsen Gauges, High Pressure Measurement, Pressure Calibration
- Topic no 22: Flow Measurement: Drag Force Flow Meter, Turbine Flow Meter, Electronic Flow Meter
- Topic no 23: Electro Magnetic Flow meter. Hot-Wire Anemometer. Temperature Measurement: Electrical, Non-electrical and Radiation Methods

Study Scheme				Evaluation Scheme			Total Marks
L	T	P	Credits	Internal Assessment	External Assessment (Examination)		
Max. Marks	Max. Marks	Exam Duration					
3	1	-	4	25	75	3 hours	100

Text Books:

1. Measurement systems Application and Design. Ernest O. Doebelin, Tata McGraw Hill Edition (Fourth Edition) 2002.
2. Measurement and Instrumentation in Engineering, Francis S. Tse and Ivan E. Morse, Marcel Dekker.

Reference Books:

1. Principles of Measurement and Instrumentation – Alan S. Morris Prentice Hall of India.
2. Mechanical Measurements : T.G. Beckwith, W.L. Buck and R.D. Marangoni Addison Wesley.
3. Instrumentation, Measurement and Analysis – B.C. Nakra and K.K. Chaudhary, TMH.
4. Mechanical Measurements by D. S. Kumar, Kataria & Sons.



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering– 6th Semester

Subject: Industrial Engg. (Theory)

Subject Code: ME 312B

Detailed Contents

Unit No. 1_Introduction, Production System And Productivity, Workforce Management, Work Study

- Topic No.1: Definition and brief history of industrial engineering
- Topic No.2: Objectives and relevance of industrial engineering for achieving excellence in industry
- Topic No.3: Decisions in industrial engineering
- Topic No.4: Value addition, products and services
- Topic No.5: Conversion process
- Topic No.6: Production system
- Topic No.7: Types of production system
- Topic No.8: Productivity and its measurement
- Topic No.9: Factors effecting productivity and strategies for improving productivity
- Topic No.10: Teams, employee empowerment
- Topic No.11: Quality circles
- Topic No.12: Incentive plans
- Topic No.13: Job design, job specialization, job enlargement, job rotation, job enrichment
- Topic No.14: Method study, Principles of motion economy
- Topic No.15: Techniques of method study- various charts, therbligs
- Topic No.16: Work measurement- various methods
- Topic No.17: Time study
- Topic No.18: PMTS, determining time, work sampling, numericals

Unit No. 2.Manufacturing Cost Analysis, Materials Management

- Topic No.19: Elements of cost, overheads estimation
- Topic No.20: Types of cost, cost variance analysis, fixed & variable costs
- Topic No.21: Break even analysis, numericals
- Topic No.22: Strategic importance of materials in industries
- Topic No.23: Pressure for high and low inventory, relevant costs
- Topic No.24: Basic inventory control models-EOQ, EBQ with and without shortage, purchase discounts
- Topic No.25: Sensitivity analysis, inventory control systems- P, Q, systems, service level, stockout risk
- Topic No.26: Determination of order point and safety stock
- Topic No.27: Selective inventory control-ABC, FSN, SDE, VED. numericals

Unit No.3: Production Planning And Control(PPC)

- Topic No.28: Introduction to forecasting- Simple and weighted moving average methods
- Topic No.29: Objectives and variables of PPC
- Topic No.30: Aggregate planning- basic concept and its relation with other decision areas
- Topic No.31: Master Production Schedule
- Topic No.32: Scheduling operations, various methods for line and intermittent production systems
- Topic No.33: Gantt chart, Sequencing- Johnson algorithm for n jobs and 2 machines, n jobs & 3 machines, 2 jobs & n Machines, n jobs & m machines
- Topic No.34: Various means of measuring effectiveness of PPC

Unit No.4.Product Design And Development, Manufacturing Strategies

- Topic No.35: Various approaches
- Topic No.36: Product life cycle
- Topic No.37: Role of 3S's –Standardization, Simplification,Specialization
- Topic No.38: Introduction to value engineering
- Topic No.39: Role of ergonomics in product design
- Topic No.40: Intoduction to JIT
- Topic No.41: TPM, fundamentals of quality & TQM



PM

COLLEGE OF ENGINEERING

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to Deenbandhu Chhotu Ram University of Science & Technology

- Topic No.42: Kaizan- elements, benefits and implementation aspects
Topic No.43: Supply Chain Management
Topic No.44: Management Information system (MIS) and its role in decision making

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	

Text Books

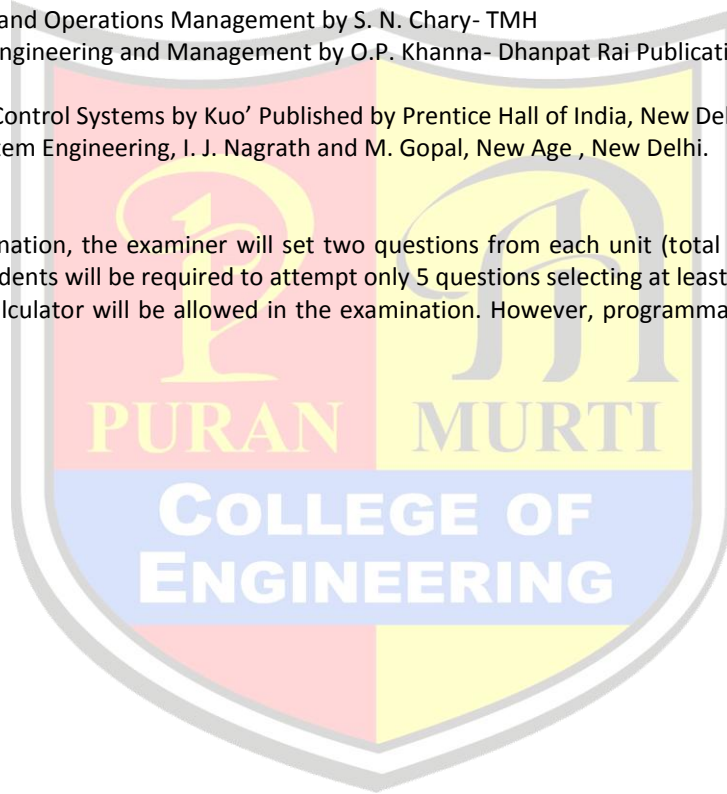
1. Production and Operations Management by S. N. Chary- TMH
2. Industrial Engineering and Management by O.P. Khanna- Dhanpat Rai Publications

REFERENCE BOOKS:

1. Automatic Control Systems by Kuo' Published by Prentice Hall of India, New Delhi.
2. Control System Engineering, I. J. Nagrath and M. Gopal, New Age , New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.





SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Dynamics Of Machines Lab

Subject Code: ME 314B

Detailed Content

List of Experiments:

1. To perform experiment on Watt Governors to prepare performance characteristic curves.
2. To perform experiment on Porter Governors to prepare performance characteristic curves.
3. To perform experiment on Proell Governor to prepare performance characteristic curves.
4. To perform experiment on Hartnell Governor to prepare performance characteristic curves.
5. To study the different types of Brakes and Dynamometers.
6. To study gyroscopic effects on Aeroplane and Naval ship
7. To find experimentally the Gyroscopic couple on motorized gyroscope and compare with applied couple.
8. To perform the experiment for static balancing on Static Balancing Machine.
9. To perform the experiment for dynamic balancing on Dynamic Balancing machine.
10. Determine the turning moment on crank shaft neglecting weight of the connecting rod in the reciprocating parts of an engine.
11. To perform the experiment of balancing of rotating parts and finds the unbalanced couple and forces
12. To determine experimentally the unbalance forces and couples of reciprocating parts.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		Internal Assessment	External Assessment (Examination)		Exam Duration		
L	T	P	Credits	Max. Marks		Max. Marks	Exam Duration
		2	1	20	30	3 hours	50

Note:

1. Ten experiments are to be performed in the Semester.
2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus (ME302B).



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Heat Transfer Lab

Subject Code: ME316B

Detailed Content

List of Experiments:

1. To determine the thermal conductivity of a metallic rod.
2. To determine the thermal conductivity of an insulating power.
3. To determine the thermal conductivity of a solid by the guarded hot plate method.
4. To find the effectiveness of a pin fin in a rectangular duct natural convective condition and plot temperature distribution along its length.
5. To find the effectiveness of a pin fin in a rectangular duct under forced convective and plot temperature distribution along its length.
6. To determine the surface heat transfer coefficient for a heated vertical tube under natural convection and plot the variation of local heat transfer coefficient along the length of the tube. Also compare the results with those of the correlation.
7. To determine average heat transfer coefficient for a externally heated horizontal pipe under forced convection & plot Reynolds and Nusselt numbers along the length of pipe. Also compare the results with those of the correlations.
8. To measure the emissivity of the gray body (plate) at different temperature and plot the variation of emissivity with surface temperature.
9. To find overall heat transfer coefficient and effectiveness of a heat exchange under parallel and counter flow conditions. Also plot the temperature distribution in both the cases along the length of heat of heat exchanger.
10. To verify the Stefan-Boltzmann constant for thermal radiation.
11. To demonstrate the super thermal conducting heat pipe and compare its working with that of the best conductor i.e. copper pipe. Also plot temperature variation along the length with time or three pipes.
12. To determine the critical heat flux using two phase heat transfer apparatus.
13. To determine the water side overall heat transfer coefficient on a U-tube heat exchanger.
14. Design of Heat exchanger using CAD and verification using thermal analysis package eg. ANSYS software etc.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

Note:

1. Ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the department as per the scope of the syllabus (ME306B).



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering – 6th Semester

Subject: Measurement And Instrumentation Lab

Subject Code: ME 318B

Detailed Content

List of Experiments:

- To Study various Temperature Measuring Instruments and to Estimate their Response times.
 - Mercury – in glass thermometer
 - Thermocouple
 - Electrical resistance thermometer
 - Bio-metallic strip
- To study the working of Bourdon Pressure Gauge and to check the calibration of the gauge in a dead-weight pressure gauge calibration set up.
- To study a Linear Variable Differential Transformer (LVDT) and use it in a simple experimental set up to measure a small displacement.
- To study the characteristics of a pneumatic displacement gauge.
- To measure load (tensile/compressive) using load cell on a tutor.
- To measure torque of a rotating shaft using torsion meter/strain gauge torque transducer.
- To measure the speed of a motor shaft with the help of non-contact type pick-ups (magnetic or photoelectric).
- To measure the stress & strain using strain gauges mounted on simply supported beam/cantilever beam.
- To measure static/dynamic pressure of fluid in pipe/tube using pressure transducer/pressure cell.
- To test experimental data for Normal Distribution using Chi Square test.
- To learn the methodology of pictorial representation of experimental data and subsequent calculations for obtaining various measures of true value and the precision of measurement using Data acquisition system/ calculator.
- Vibration measurement by Dual Trace Digital storage Oscilloscope.
- To find out transmission losses by a given transmission line by applying capacitive /inductive load.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

Note:

- At least ten experiments are to be performed in the Semester.
- At least seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the department as per the scope of the Syllabus (ME310B).



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering– 6th Semester

Subject: Report Writing Skills

Subject Code: HUM 302 B

Detailed Content

UNIT NO.1 Report Writing

- Topic No.1 Reports: meaning I
- Topic No.2 Importance and types
- Topic No.3 Structure of reports
- Topic No.4 Formats of reports
- Topic No.5 Use of illustrations

UNIT NO.2 Writing Of Business & Technical Reports

- Topic No.6 Preliminary steps and procedure of writing report
- Topic No.7 Writing various types of reports on technical, business related topics

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

RECOMMENDED READING:

1. Borowick, Jerome. N. *Technical Communication and its Applications*. New Delhi: PHI, 2000
2. Guffey, Mary Ellen. *Business Communication: Process & Product*. USA: South western College Publishing, 2000.
3. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST) AND INSTRUCTIONS FOR THE EXAMINER:

1. The duration of the exam will be 2 hours.
2. The Question Paper for this theory course shall have three questions in all covering both the units. All will be compulsory with internal choice.
3. Question no. 1 will be of 10 marks. The question may have two/three parts with enough internal choice, covering various components of both the Units.
4. Question no 2 with internal choice will be of 10 marks covering contents of the Unit I. It will be theoretical in nature.
5. Question no 3 will have two parts of 15 marks each. The student will be asked to write reports on business and technical subject/ issue covering contents of Unit II. The emphasis would be on testing the actual report writing on a given business and technical situation/ subject in letter format.



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering– 6th Semester

Subject: Oral Presentation Skills

Subject Code: HUM- 304 B

Detailed Content

OBJECTIVE

To enable students to develop their speaking skills with professional proficiency

COURSE CONTENT

Oral Presentations:
Group Discussion; Mock interviews

Note for the Teacher:

The teacher concerned, by devising her/his method, must preview and review the student's spoken proficiency at the beginning and end of the semester respectively to find the efficacy of the course and degree of improvement in the student.

RECOMMENDED READING

1. Konar, Nira. *English Language Laboratories: A Comprehensive Manual*. Delhi: PHI, 2011
2. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

Scheme of End Semester Examination (Practical)

An external Practical exam of 30 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the competent authority of the University's.

NOTE:

Students will be tested for their oral communication competence making them participate in Group discussion, mock situations for interview. Students may also be evaluated through a viva conducted by an external examiner.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	2	1	20	30	2Hrs	50



SYLLABUS: B Tech (ME)

Department: Mechanical Engineering– 6th Semester

Subject: General Fitness For The Profession

Subject Code: GPME- 302B

Detailed Content

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

- I. Academic Performance **(8 Marks)**
- II. Extra Curricular Activities / Community Service, Hostel Activities **(8 Marks)**
- III Technical Activities / Industrial, Educational tour **(14 Marks)**
- IV Sports/games **(15 Marks)**
- V Moral values & Ethics

NOTE: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/her achievement and verbal & communicative skill through presentation before the committee. **(30 Marks)**

C. Moral values & Ethics

Syllabus - A few topics from the below mentioned books

1. R.R.Gaur, R. Sangal and G.P. Bagaria, “ Bagaria, “ A foundation course in Human Values and Professional Ethics”, Pub: Excel Books, New Delhi-110028.
2. M. Govindrajan, S Natrajan & V.S. Senthil Kumar, “ Engineering Ethics (including Human Values)” Eastern Economy Edition, Prentics Hall of India Ltd.

A minor test/Quiz will be conducted during the semester and it will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

- | | | |
|---|-------------------------------|----------|
| 1 | Chairperson of the Department | Chairman |
| 2 | Senior Most Faculty Counselor | Member |
| 3 | Vice- Chancellor’s Nominee | Member |

Affiliated Colleges:

- | | |
|---|----------|
| Director/Principal | Chairman |
| Head of the Department/Sr. Faculty | Member |
| External Examiner to be appointed by the University | Member |

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	-	2	75	-	-	75