HU-301
Principles of Management
B.Tech Semester V/ VI

L	T	P		
3	1	0	Credits	3.5
			Theory	60
			Sessionals	40
			Duration of Exam : 3 hours	

Objective: Objective of this course is to understand the concepts and techniques of management and to equip the students with managerial skill that are essential to take effective decisions.

Unit-1

Personnel Management: Meaning and Functions of Personnel Management. Job Analysis: process, Job Description and Job Specification. Recruitment & Selection. Training- Meaning, objectives and Methods of training. Performance Appraisal-Meaning and Methods of performance appraisal.

Unit-2

Financial management- meaning and objectives of financial management; Status and duties of financial manager. Capital structure decisions: Features of appropriate capital structure. Sources of finance. Working capital- Meaning , Factors affecting requirements of working capital.

Unit-3

Production Management: Definition and Objectives. Production control: Meaning and Importance of Production control and steps involved in Production control. Plant location: Factors affecting Plant location Plant Layout : Factors affecting Plant Layout; Brief introduction to the concept of material management; Inventory control techniques.

Unit-4

Marketing Management-. Meaning ,Functions and importance of marketing Management. Marketing Mix, Role of computers in marketing management. Marketing Information system. Marketing and Society: Social Responsibility and marketing Ethics.

Note: - Eight questions are to be set taking at least one from each unit. The students are required to attempt five questions in all taking at least one from each unit.

References:

1. R.S.Gupta, B.D. Sharma, N.S. Bhalla, "Principle and practices of Management" Kalyani Publishers.
2. T.N. Chhabra, Dhanpat Rai & Co." Principles and Practices of management "
3. R.D. Aggarwal, Tata McGraw Hill "Organization and Management"
4. M.C. Shukla " Business organization and Management"
5. Drucker, Pater F., New York, " The Practice of Management".
6. Edwin B. Flippo : Principles of Personnel Management (McGraw Hill)
7. Michael J. Lucius : Personnel Management, (Richard D Irwin Homewood).
8. R.C. Saxena : Labour Problems and Social Welfare (K. Nath & Co. Meerut).
9. Kotler, Philip and Graw Armstrong "Principle of Marketing". (New Delhi: Prentice Hall of India)
10. I.M.Pandey, "Financial Management" (Vikas Publishing House Pvt. Ltd.)

M.M.UNIVERSITY,MULLANA 2008

HU-301 Principles of Management B.Tech Semester V/ VI L T P Credits 3.5 3 1 0 Theory 60 Sessionals 40 Duration of Exam : 3 hours Objective: Objective of this course is to understand the concepts and techniques of management and to equip the students with managerial skill that are essential to take effective decisions. Unit-1 Personnel Management: Meaning and Functions of Personnel Management. Job Analysis: process, Job Description and Job Specification. Recruitment & Selection. Training- Meaning, objectives and Methods of training. Performance Appraisal-Meaning and Methods of performance appraisal. Unit-2 Financial management- meaning and objectives of financial management; Status and duties of financial manager. Capital structure decisions: Features of appropriate capital structure. Sources of finance. Working capital- Meaning , Factors affecting requirements of working capital. Unit-3 Production Management: Definition and Objectives. Production control: Meaning and Importance of Production control and steps involved in Production control. Plant location: Factors affecting Plant location Plant Layout : Factors affecting Plant Layout; Brief introduction to the concept of material management; Inventory control techniques. Unit-4 Marketing Management-. Meaning ,Functions and importance of marketing Management. Marketing Mix, Role of computers in marketing management. Marketing Information system. Marketing and Society: Social Responsibility and marketing Ethics.

Note: - Eight questions are to be set taking at least one from each unit. The students are required to attempt five questions in all taking at least one from each unit. References:

1. R.S.Gupta, B.D. Sharma, N.S. Bhalla, “Principle and practices of Management” Kalyani Publishers. 2. T.N. Chhabra, Dhanpat Rai & Co.” Principles and Practices of management ” 3. R.D. Aggarwal, Tata McGraw Hill “Organization and Management” 4. M.C. Shukla “ Business organization and Management” 5. Drucker, Pater F., New York, “ The Practice of Management”. 6. Edwin B. Flippo : Principles of Personnel Management (McGraw Hill) 7. Michael J. Lucius : Personnel Management, (Richard D Irwin Homewood). 8. R.C. Saxena : Labour Problems and Social Welfare (K. Nath & Co. Meerut). 9. Kotler, Philip and Graw Armstrong “Principle of Marketing”.

(New Delhi: Prentice Hall of India) 10. I.M.Pandey, “Financial Management” (Vikas Publishing House Pvt. Ltd.)

B.Tech. (Sixth semester) Mechanical engineering

ME 302 Refrigeration and Air-Conditioning

L	T	P		
3	1	0	**Theory:**	**60**
			Continuous Evaluation:	**40**
			Time:	**3 Hours**
			Credit:	**3.5**

Unit-1: Basics of Refrigeration

Basics of heat pump & refrigerator; Carnot's refrigeration and heat pump; Units of refrigeration; COP of refrigerator and heat pump; Carnot's COP; ICE refrigeration; evaporative refrigeration; refrigeration by expansion of air; refrigeration by throttling of gas; Vapor refrigeration system; steam jet refrigeration; thermoelectric cooling; adiabatic demagnetization.

Basic principles of operation of air refrigeration system, Bell-Coleman air refrigerator; advantages of using air-refrigeration in aircrafts; disadvantages of air refrigeration in comparison to other cold producing methods; simple air refrigeration in air craft; simple evaporative type air refrigeration in aircraft; necessity of cooling the aircraft.

Unit-2: Classification of Refrigeration Systems

Simple Vapor Compression Refrigeration System; different compression processes(wet compression, dry or dry and saturated compression, superheated compression); Limitations of vapour compression refrigeration system if used on reverse Carnot cycle; representation of theoretical and actual cycle on T-S and P-H charts; effects of operating conditions on the performance of the system; advantages of vapour compression system over air refrigeration system.

Methods of improving COP; flash chamber; flash inter cooler; optimum interstate pressure for two stage refrigeration system; single expansion and multi expansion processes; basic introduction of single load and multi load systems; Cascade systems.

Basic absorption system; COP and Maximum COP of the absorption system; actual NH_3 absorption system; functions of various components; Li-Br absorption system; selection of refrigerant and absorbent pair in vapour absorption system; Electro refrigerator; Comparison of Compression and Absorption refrigeration systems; nomenclature of refrigerants; desirable properties of refrigerants; cold storage and ice-plants.

Unit-3: Air-Conditioning and Psycometry

Difference in refrigeration and air conditioning; Psychometric properties of moist air (wet bulb, dry bulb, dew point temperature, relative and specific humidity of moist air, temperature of adiabatic saturation); empirical relation to calculate P_v in moist air.

Psychometric chart, construction and use, mixing of two air streams; sensible heating and cooling; latent heating and cooling; humidification and dehumidification; cooling with dehumidification; cooling with adiabatic humidification; heating and humidification; by-pass factor of coil; sensible heat factor; ADP of cooing coil; Air washer.

Unit-4: Classification of Air-Conditioning Systems and Design Consideration

Classification; factors affecting air conditioning systems; comfort air-conditioning system; winter air conditioning system; summer air-conditioning system; year round air conditioning. unitary air-conditioning system; central air conditioning system; room sensible heat factor; Grand sensible heat factor; effective room sensible heat factor.

Inside design conditions; comfort conditions; components of cooling loads; internal heat gains from (occupancy, lighting, appliances, product and processes); system heat gain (supply air duct, A.C. fan, return air duct); external heat gain (heat gain through building, solar heat gains through outside walls and roofs); solar air temperature; solar heat gain through glass areas; heat gain due to ventilation and infiltration. Transport air conditioning; evaporative condensers, cooling towers; heat pumps.

Recommended Books:

1. Refrigeration and air-conditioning by C.P arora
2. Basic Refrigeration and air-conditioning by Annanthana and Rayanan, TMG
3. Refrigeration and air-conditioning BY Arora and Domkundwar, Dhanpat rai

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B.Tech. (Sixth semester) Mechanical engineering

ME 302 Refrigeration and Air-Conditioning

L T P Theory: 60 3 1 0 Continuous Evaluation: 40

Time: 3 Hours Credit: 3.5 Unit-1: Basics of Refrigeration Basics of heat pump & refrigerator; Carnot's refrigeration and heat pump; Units of refrigeration; COP of refrigerator and heat pump; Carnot's COP; ICE refrigeration; evaporative refrigeration; refrigeration by expansion of air; refrigeration by throttling of gas; Vapor refrigeration system; steam jet refrigeration; thermoelectric cooling; adiabatic demagnetization. Basic principles of operation of air refrigeration system, Bell-Coleman air refrigerator; advantages of using air-refrigeration in aircrafts; disadvantages of air refrigeration in comparison to other cold producing methods; simple air refrigeration in air craft; simple evaporative type air refrigeration in aircraft; necessity of cooling the aircraft. Unit-2: Classification of Refrigeration Systems Simple Vapor Compression Refrigeration System; different compression processes(wet compression, dry or dry and saturated compression, superheated compression); Limitations of vapour compression refrigeration system if used on reverse Carnot cycle; representation of theoretical and actual cycle on T-S and P-H charts; effects of operating conditions on the performance of the system; advantages of vapour compression system over air refrigeration system. Methods of improving COP; flash chamber; flash inter cooler; optimum interstate pressure for two stage refrigeration system; single expansion and multi expansion processes; basic introduction of single load and multi load systems; Cascade systems. Basic absorption system; COP and Maximum COP of the absorption system; actual NH

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tion system; functions of various components; Li-Br absorption system; selection of refrigerant and absorbent pair in vapour absorption system; Electro refrigerator; Comparison of Compression and Absorption refrigeration systems; nomenclature of refrigerants; desirable properties of refrigerants; cold storage and ice-plants. Unit-3: Air-Conditioning and Psycometry Difference in refrigeration and air conditioning; Psychometric properties of moist air (wet bulb, dry bulb, dew point temperature, relative and specific humidity of moist air, temperature of adiabatic saturation); empirical relation to calculate P

v

in moist air. Psychometric chart, construction and use, mixing of two air streams; sensible heating and cooling; latent heating and cooling; humidification and dehumidification; cooling with dehumidification; cooling with adiabatic humidification; heating and humidification; by-pass factor of coil; sensible heat factor; ADP of cooing coil; Air washer. Unit-4: Classification of Air-Conditioning Systems and Design Consideration Classification; factors affecting air conditioning systems; comfort air-conditioning system; winter air conditioning system; summer air-conditioning system; year round air conditioning. unitary air-conditioning system; central air conditioning system; room sensible heat factor; Grand

sensible heat factor; effective room sensible heat factor. Inside design conditions; comfort conditions; components of cooling loads; internal heat gains from (occupancy, lighting, appliances, product and processes); system heat gain (supply air duct, A.C. fan, return air duct); external heat gain (heat gain through building, solar heat gains through outside walls and roofs); solar air temperature; solar heat gain through glass areas; heat gain due to ventilation and infiltration. Transport air conditioning; evaporative condensers, cooling towers; heat pumps.
Recommended Books:

1. Refrigeration and air-conditioning by C.P arora 2. Basic Refrigeration and air-conditioning by Annanthana and Rayanan, TMG 3. Refrigeration and air-conditioning BY Arora and Domkundwar, Dhanpat rai

B.Tech. (Sixth semester) Mechanical engineering
ME 304 Tribology

L	T	P		
3	1	0	Theory:	60
			Continuous Evaluation:	40
			Time:	3 Hours
			Credit:	3.5

Unit-1: Surface Texture and Friction

Introduction to tribological systems and their characteristic features; analysis and assessment of surface; topography; deterministic and stochastic tribo-models for asperity contacts; techniques of surface examination; technological properties of surfaces. Quantitative laws of sliding friction, causes of friction, adhesion theory, laws of rolling friction, measurement of friction.

Unit-2: Wear

Introduction, mechanism of wear, types of wear, quantitative laws of wear, measurement of wear, wears resistance materials

Unit-3: Lubrication

Introduction, dry friction, boundary lubrication, hydrodynamic, hydrostatic and elasto-hydrodynamic lubrication, functions of lubricants, types and properties, lubricant additives. Principles, application to rolling contact bearings, cams, Gears

Unit-4: Bearings

Reynolds Equation of Lubrication in Two and Three Dimensional Geometry and pressure equation of journal bearing, hydrostatic bearings, thrust bearings, porous bearings and hydrodynamic gas bearings. Journal bearings with specialized applications. General requirements and different types of bearing materials. Introduction to Nano-Tribology.

Recommended Books:

1. Tribology in Indertrion- By Sushil Kumar Srivastava
2. Introduction to Tribology of Bearings- By B.C. Majumdar ; A.H.Wheeler
3. Principles of Tribology – By J. Halling, Macmillan
4. Mechanics and Chemistry in Lubrication- By Dorinson and Ludema , Elsevier
5. Friction and wear of Materials- By E. Robinowicz, Johan Wiley
6. Principles of Lubrication-By A. Cameron, Longmans

NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

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B.Tech. (Sixth semester) Mechanical engineering ME 304 Tribology

L T P Theory: 60 3 1 0 Continuous Evaluation: 40

Time: 3 Hours Credit: 3.5 Unit-1: Surface Texture and Friction Introduction to tribological systems and their characteristic features; analysis and assessment of surface; topography; deterministic and stochastic tribo-models for asperity contacts; techniques of surface examination; technological properties of surfaces. Quantitative laws of sliding friction, causes of friction, adhesion theory, laws of rolling friction, measurement of friction.

Unit-2: Wear Introduction, mechanism of wear, types of wear, quantitative laws of wear, measurement of wear, wears resistance materials

Unit-3: Lubrication

Introduction, dry friction, boundary lubrication, hydrodynamic, hydrostatic and elasto-hydrodynamic lubrication, functions of lubricants, types and properties, lubricant additives. Principles, application to rolling contact bearings, cams, Gears

Unit-4: Bearings Reynolds Equation of Lubrication in Two and Three Dimensional Geometry and pressure equation of journal bearing, hydrostatic bearings, thrust bearings, porous bearings and hydrodynamic gas bearings. Journal bearings with specialized applications. General requirements and different types of bearing materials. Introduction to Nano-Tribology.

Recommended Books:

1. Tribology in Indertrion- By Sushil Kumar Srivastava 2. Introduction to Tribology of Bearings- By B.C. Majumdar ; A.H.Wheeler 3. Principles of Tribology – By J. Halling, Macmillan 4. Mechanics and Chemistry in Lubrication- By Dorinson and Ludema , Elsevier 5. Friction and wear of Materials- By E. Robinowicz, Johan Wiley 6. Principles of Lubrication-By A. Cameron, Longmans NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

B.Tech. (Sixth semester) Mechanical engineering
ME-306 Mechanical Vibration

L	T	P
3	1	0

Theory: 60
Continuous Evaluation: 40
Time: 3 Hours
Credit: 3.5

Unit-1: Fundamentals of vibrations

Kinematics of simple vibrating motion, Simple harmonic motions, complex method of representing harmonic vibrations. Vectorial representation of harmonic motion. Degree of freedom, Equations of motions of different un-damped single degree of freedom system.

Unit-2: Damped free vibrations, forced vibrations

Damped free vibration, undamped and damped forced vibrations, Vibrating isolation, Vibrating instruments.

Unit-3: Two and multi degree of freedom systems

Principal modes of vibration. Other cases of two degree of freedoms systems. Influence coefficients, Dunkerleys equation, Matrix iteration, Holzer method, Rayleigh method.

Unit-4: Transverse and torsional vibration. Transient vibrations

Transverse vibration of strings, Longitudinal vibrations of bars, Lateral vibration of beams, Torsional vibration of circular shafts, Whirling of shafts.
Introduction, Method of Laplace transformation and response to an impulsive output, response to step-input, pulse-input, and phase plane method.

Reference Books:

1. Mechanical vibration - By G.K. Grover; Nemchand Chand and Sons
2. Mechanical Vibration – By Thomson; Prentice Hall
3. Mechanical Vibration - By Den Hartog; Mc Graw Hill
4. Introductory course to mechanical vibrations – By Rao and Gupta; Wiley Eastern

NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

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B.Tech. (Sixth semester) Mechanical engineering ME-306 Mechanical Vibration L T P Theory: 60 3 1 0 Continuous Evaluation: 40

Time: 3 Hours Credit: 3.5

Unit-1: Fundamentals of vibrations Kinematics of simple vibrating motion, Simple harmonic motions, complex method of representing harmonic vibrations. Vectorial representation of harmonic motion. Degree of freedom, Equations of motions of different un-damped single degree of freedom system.

Unit-2: Damped free vibrations, forced vibrations Damped free vibration, undamped and damped forced vibrations, Vibrating isolation, Vibrating instruments.

Unit-3: Two and multi degree of freedom systems Principal modes of vibration. Other cases of two degree of freedoms systems. Influence coefficients, Dunkerleys equation, Matrix iteration, Holzer method, Rayleigh method.

Unit-4: Transverse and torsional vibration. Transient vibrations Transverse vibration of strings, Longitudinal vibrations of bars, Lateral vibration of beams, Torsional vibration of circular shafts, Whirling of shafts. Introduction, Method of Laplace transformation and response to an impulsive output, response to step-input, pulse-input, and phase plane method.

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1. Mechanical vibration - By G.K. Grover; Nemchand Chand and Sons 2. Mechanical Vibration – By Thomson; Prentice Hall 3. Mechanical Vibration - By Den Hartog; Mc Graw Hill 4. Introductory course to mechanical vibrations – By Rao and Gupta; Wiley Eastern

NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

B.Tech. (Sixth semester) Mechanical engineering

ME 308 Computer Aided Design and Manufacturing

L	T	P		
3	1	0	**Theory:**	**60**
			Continuous Evaluation:	**40**
			Time:	**3 Hours**
			Credit:	**3.5**

Unit-1: Basics of Geometric Modelling & Group technology

Introduction to CAD/CAM, Historical Development, Industrial look at CAD/CAM, Introduction to CIM Basic of Geometric & Solid modeling, Coordinate systems, Explict, Implict, Intrinsic and parametric equation,Part families, Part classification and coding, Machine cell Design, Advantages of GT

Unit-2: Representation of Curves and Geometric transformations

Introduction, Transformation of points & line, 2-D rotation, Reflection, Scaling and combined transformation, Homogeneous coordinates, 3-D scaling, shearing, rotation, reflection and translation, combined transformations, Orthographic and perspective projections, Algebraic and geometric forms, tangent & normal blending functions, Re-parametrization, Straight line, conics, cubic splines, bezier curves and B-spline curves

Unit-3: Representation of surfaces and solids

Algebraic and geometric forms, tangent & twist vectors, normal blending function, reparametrization, , Plane surface, ruled surface,Surface of revolution, tabulated cylinder Bi-cubic surface, bezier surface, B-spline surface,Solid models and representation scheme B-rep & CSG, sweep representation ,Cell decomposition

Unit-4: Numeric control and flexible manufacturing systems

Introduction, fixed programmable and flexible automation, Types of NC systems, MCU & other components, Co-ordinate system, NC manual part programming, G & M codes, part program for simple parts, Introduction, FMS component, Types of FMS, FMS layout, Planning for FMS, advantage and applications Introduction, conventional process planning, Steps in variant process planning, types of CAPP, planning for CAPP

Recommended Books:

1. CAD/CAM theory & practice by Ibrahim Zeid,T.M.H,India
2. CAD/CAM by Groover & Zimmer, P.H.I,India
3. Numerical control and computer aided manufacturing by RAO and Tiwari, T.M.H.

NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

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B.Tech. (Sixth semester) Mechanical engineering

ME 308 Computer Aided Design and Manufacturing

L T P Theory: 60 3 1 0 Continuous Evaluation: 40

Time: 3 Hours Credit: 3.5 Unit-1: Basics of Geometric Modelling & Group technology Introduction to CAD/CAM, Historical Development, Industrial look at CAD/CAM, Introduction to CIM Basic of Geometric & Solid modeling, Coordinate systems, Explict, Implict, Intrinsic and parametric equation,Part families, Part classification and coding, Machine cell Design, Advantages of GT

Unit-2: Representation of Curves and Geometric transformations

Introduction, Transformation of points & line, 2-D rotation, Reflection, Scaling and combined transformation, Homogeneous coordinates, 3-D scaling, shearing, rotation, reflection and translation, combined transformations, Orthographic and perspective projections, Algebraic and geometric forms, tangent & normal blending functions, Re-parametrization, Straight line, conics, cubic splines, bezier curves and B- spline curves Unit-3: Representation of surfaces and solids Algebraic and geometric forms, tangent & twist vectors, normal blending function, reparametrization, , Plane surface, ruled surface,Surface of revolution, tabulated cylinder Bi-cubic surface, bezier surface, B-spline surface,Solid models and representation scheme B-rep & CSG, sweep representation ,Cell decomposition Unit-4: Numeric control and flexible manufacturing systems

Introduction, fixed programmable and flexible automation, Types of NC systems, MCU & other components, Co-ordinate system, NC manual part programming, G & M codes, part program for simple parts, Introduction, FMS component, Types of FMS, FMS layout, Planning for FMS, advantage and applications Introduction, conventional process planning, Steps in variant process planning, types of CAPP, planning for CAPP

Recommended Books:

1. CAD/CAM theory & practice by Ibrahim Zeid,T.M.H,India 2. CAD/CAM by Groover & Zimmer, P.H.I,India 3. Numerical control and computer aided manufacturing by RAO and Tiwari, T.M.H. NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

B.Tech. (Sixth semester) Mechanical engineering

ME 310 Machine Design- II

L	T	P
2	0	6

Theory: 60
Continuous Evaluation: 40
Time: 4 Hours
Credit: 5.0

Unit-1: Gears

Classification of Gears; Selection of type; Law of Gearing, Standard system of Gear tooth, Various Failure modes, Interference, undercutting & minimum no. Of teeth

Spur gear: Force Analysis ,Beam strength of Gear tooth, Effective load on tooth, Estimation of module based on beam strength and wear strength, Gear lubrication, materials; Design Procedure,

Helical gear: Terminology, Force Analysis, Virtual no. of teeth, Beam strength, Effective load, Wear strength

Bevel gear: Terminology, force analysis, beam strength & wear strength, effective load on gear tooth

Worm& worm wheel: Terminology, properties, force analysis, friction, material selection

Unit-2: Belts and Clutches

Design of flat belts &Pulleys, Design /selection of V belts &Pulleys, Design/selection of wire ropes, Design/selection of chains,Single &multiple Plate clutch, Cone clutch

Unit-3: Springs and Bearings

Coil Springs, Leaf Springs, Hydro-dynamically lubricated bearings (journal bearing), Selection of ball bearings, Selection of roller bearings, Selection of taper roller bearings

Unit-4: I.C Engine Parts

Design of Cylinder, Design of Piston, Design of Crank shaft, Design of connecting rod, Design of Crane Hook, Design of Flywheels

Recommended Books:

1. Design of Machine Elements by Bhandari, TMH
2. Machine Design by Sharma Aggarwal, Katson Publishers
3. PSG Design Data Book by PSG College of Engg PSG Publication
4. Machine Design an integrated Approch Robert I Norton, prentice hall
5. Fundamental of machine component design R.C Juvinnal, Johan wiley& sons

NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

M.M.UNIVERSITY,MULLANA 2008

B.Tech. (Sixth semester) Mechanical engineering

ME 310 Machine Design- II

L T P Theory: 60 2 0 6 Continuous Evaluation: 40

Time: 4 Hours Credit: 5.0

Unit-1: Gears Classification of Gears; Selection of type; Law of Gearing, Standard system of Gear tooth, Various Failure modes, Interference, undercutting & minimum no. Of teeth Spur gear: Force Analysis ,Beam strength of Gear tooth, Effective load on tooth, Estimation of module based on beam strength and wear strength, Gear lubrication, materials; Design Procedure,

Helical gear: Terminology, Force Analysis, Virtual no. of teeth, Beam strength, Effective load, Wear strength Bevel gear: Terminology, force analysis, beam strength & wear strength, effective load on gear tooth Worm& worm wheel: Terminology, properties, force analysis, friction, material selection

Unit-2: Belts and Clutches Design of flat belts &Pulleys, Design /selection of V belts &Pulleys, Design/selection of wire ropes, Design/selection of chains,Single &multiple Plate clutch, Cone clutch

Unit-3: Springs and Bearings Coil Springs, Leaf Springs, Hydro-dynamically lubricated bearings (journal bearing), Selection of ball bearings, Selection of roller bearings, Selection of taper roller bearings

Unit-4: I.C Engine Parts Design of Cylinder, Design of Piston, Design of Crank shaft, Design of connecting rod, Design of Crane Hook, Design of Flywheels Recommended Books:

1. Design of Machine Elements by Bhandari, TMH 2. Machine Design by Sharma Aggarwal, Katson Publishers 3. PSG Design Data Book by PSG College of Engg PSG Publication 4. Machine Design an integrated Approch Robert l Norton, prentice hall 5. Fundamental of machine component design R.C Juvinnal, Johan wiley& sons NOTE: In the semester examination, the examiner will set 8 questions in all, at least two question from each unit, and students will be required to attempt only 5 questions, at least one from each unit.

B.Tech. (Sixth semester) Mechanical engineering
ME 312 Refrigeration and Air Conditioning Lab

L	T	P		
0	0	2	**Practical:**	**20**
			Continuous Evaluation:	**30**
			Credit:	**1.0**

List of Experiments

1. Study & Performance of basic vapour compression Refrigeration Cycle.
2. To find COP of water cooler.
3. To study the walk in cooler.
4. To study and perform experiment on vapour absorption apparatus.
5. Perform the experiment & calculate various. Performance parameters on a blower apparatus.
6. To find the performance parameter of cooling tower.
7. To study various components in room air conditioner.
8. To find RH of atmosphere air by using slings Psychometric and Psychometric.
9. To find performance of a refrigeration test rig system by using different expansion devices.
10. To study different control devices of a refrigeration system.
11. To study various compressor.
12. To find the performance parameters of Ice Plant.

Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.

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B.Tech. (Sixth semester) Mechanical engineering ME 312 Refrigeration and Air Conditioning Lab

L T P Practical: 20 0 0 2 Continuous Evaluation: 30

Credit: 1.0 List of Experiments

1. Study & Performance of basic vapour compression Refrigeration Cycle. 2. To find COP of water cooler. 3. To study the walk in cooler. 4. To study and perform experiment on vapour absorption apparatus. 5. Perform the experiment & calculate various. Performance parameters on a blower apparatus. 6. To find the performance parameter of cooling tower. 7. To study various components in room air conditioner. 8. To find RH of atmosphere air by using slings Psychometric and Psychometric. 9. To find performance of a refrigeration test rig system by using different expansion devices. 10. To study different control devices of a refrigeration system. 11. To study various compressor. 12. To find the performance parameters of Ice Plant. Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.

B.Tech. (Sixth semester) Mechanical engineering

ME 314 Tribology & Mechanical Vibration Lab

L	T	P		
0	0	2	Practical:	20
			Continuous Evaluation:	30
			Credit:	1.0

List of Experiment

1. To study undamped free vibrations of equivalent spring mass system and determine the natural frequency of vibrations
2. To study the free vibration of system for different damper settings. Draw decay curve and determine the log decrement and damping factor. Find also the natural frequency
3. To study the torsional vibration of a single rotor shaft system and to determine the natural frequency.
4. To determine the radius of gyration of given bar using bifilar suspension.
5. To verify the dunker ley's rule
6. To study the forced vibration of system with damping. Load magnification factor vs. Frequency and phase angle vs frequency curves. Also determine the damping factor.
7. To study the pressure distribution of a journal bearing using a journal bearing apparatus.
8. To determine the rate of wear of a metallic pin from the plot of displacement vs time curves by using friction and wear monitor apparatus.
9. To determine abrasion index of a material with the help of dry abrasion test rig.
10. To evaluate the load wear index and the weld point of a lubricant with the help of a four ball stream pressure tester.
11. To determine the two frequencies of torsional spring type double pendulum & compare them with theoretical values.
12. To determine the radius of gyration of a compound pendulum.
13. To determine the radius of gyration of disc using trifilar suspension.

Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.

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B.Tech. (Sixth semester) Mechanical engineering ME 314 Tribology & Mechanical Vibration Lab L T P Practical: 20 0 0 2 Continuous Evaluation: 30

Credit: 1.0 List of Experiment 1. To study undamped free vibrations of equivalent spring mass system and determine the natural

frequency of vibrations 2. To study the free vibration of system for different damper settings. Draw decay curve and determine

the log decrement and damping factor. Find also the natural frequency 3. To study the torsional vibration of a single rotor shaft system and to determine the natural frequency. 4. To determine the radius of gyration of given bar using bifilar suspension. 5. To verify the dunker ley's rule 6. To study the forced vibration of system with damping. Load magnification factor vs. Frequency and

phase angle vs frequency curves. Also determine the damping factor. 7. To study the pressure distribution of a journal bearing using a journal bearing apparatus. 8. To determine the rate of wear of a metallic pin from the plot of displacement vs time curves by using

friction and wear monitor apparatus. 9. To determine abrasion index of a material with the help of dry abrasion test rig. 10. To evaluate the load wear index and the weld point of a lubricant with the help of a four ball stream

pressure tester. 11. To determine the two frequencies of torsional spring type double pendulum & compare them with

theoretical values. 12. To determine the radius of gyration of a compound pendulum. 13. To determine the radius of gyration of disc using trifilar suspension. Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.

B.Tech. (Sixth semester) Mechanical engineering

ME 316 CAD/CAM Lab

L	T	P		
0	0	3	Practical:	20
			Continuous Evaluation:	30
			Credit:	1.5

List of Experiments:

1. Introduction to Pro-Engineer.
2. To study the hardware and software of CAD System.
3. Explain in detail Commands to be used in the sketcher mode.
4. Stepwise building of a CAD M model in the sketcher mode.
5. Explain in detail Commands to be used in the PART mode.
6. Stepwise building of a CAD M model in the PART mode
7. Building an assembly of different components.
8. Introduction to commands required for generation of drawings
9. To study the different elements of FMS system, take a case study of automotive component industry.

Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.

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B.Tech. (Sixth semester) Mechanical engineering ME 316 CAD/CAM Lab L T P
Practical: 20 0 0 3 Continuous Evaluation: 30

Credit: 1.5 List of Experiments:

1. Introduction to Pro-Engineer. 2. To study the hardware and software of CAD System. 3. Explain in detail Commands to be used in the sketcher mode. 4. Stepwise building of a CAD M model in the sketcher mode. 5. Explain in detail Commands to be used in the PART mode. 6. Stepwise building of a CAD M model in the PART mode 7. Building an assembly of different components. 8. Introduction to commands required for generation of drawings 9. To study the different elements of FMS system, take a case study of automotive component

industry. Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.

HU-301
Principles of Management
B.Tech Semester V/ VI

L T P
3 1 0

Credits 3.5
Theory 60
Sessionals 40
Duration of Exam : 3 hours

Objective: Objective of this course is to understand the concepts and techniques of management and to equip the students with managerial skill that are essential to take effective decisions.

Unit-1
Personnel Management: Meaning and Functions of Personnel Management.
Job Analysis: process, Job Description and Job Specification. Recruitment & Selection.
Training- Meaning, objectives and Methods of training.
Performance Appraisal-Meaning and Methods of performance appraisal.

Unit-2
Financial management- meaning and objectives of financial management;Status and duties of financial manager.
Capital structure decisions: Features of appropriate capital structure. Sources of finance.
Working capital- Meaning , Factors affecting requirements of working capital.

Unit-3
Production Management: Definition and Objectives.
Production control: Meaning and Importance of Production control and steps involved in Production control.
Plant location: Factors affecting Plant location
Plant Layout : Factors affecting Plant Layout; Brief introduction to the concept of material management; Inventory control techniques.

Unit-4
Marketing Management-. Meaning ,Functions and importance of marketing Management.
Marketing Mix, Role of computers in marketing management. Marketing Information system.
Marketing and Society: Social Responsibility and marketing Ethics.

Note: - Eight questions are to be set taking at least one from each unit. The students are required to attempt five questions in all taking at least one from each unit.
References:

11. R.S.Gupta, B.D. Sharma, N.S. Bhalla, "Principle and practices of Management" Kalyani Publishers.
12. T.N. Chhabra, Dhanpat Rai & Co." Principles and Practices of management "
13. R.D. Aggarwal, Tata McGraw Hill "Organization and Management"
14. M.C. Shukla " Business organization and Management"
15. Drucker, Pater F., New York, " The Practice of Management".
16. Edwin B. Flippo : Principles of Personnel Management (McGraw Hill)
17. Michael J. Lucius : Personnel Management, (Richard D Irwin Homewood).
18. R.C. Saxena : Labour Problems and Social Welfare (K. Nath & Co. Meerut).
19. Kotler, Philip and Graw Armstrong "Principle of Marketing". (New Delhi: Prentice Hall of India)
20. I.M.Pandey, "Financial Management" (Vikas Publishing House Pvt. Ltd.)

M.M.UNIVERSITY,MULLANA 2008

HU-301 Principles of Management B.Tech Semester V/ VI L T P Credits 3.5 3 1 0 Theory 60 Sessionals 40 Duration of Exam : 3 hours Objective: Objective of this course is to understand the concepts and techniques of management and to equip the students with managerial skill that are essential to take effective decisions.

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Unit-2 Financial management- meaning and objectives of financial management;Status and duties of financial manager. Capital structure decisions: Features of appropriate capital structure. Sources of finance. Working capital- Meaning , Factors affecting requirements of working capital.

Unit-3 Production Management: Definition and Objectives. Production control: Meaning and Importance of Production control and steps involved in Production control. Plant location: Factors affecting Plant location Plant Layout : Factors affecting Plant Layout; Brief introduction to the concept of material management; Inventory control techniques.

Unit-4 Marketing Management-. Meaning ,Functions and importance of marketing Management. Marketing Mix, Role of computers in marketing management. Marketing Information system. Marketing and Society: Social Responsibility and marketing Ethics.

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11. R.S.Gupta, B.D. Sharma, N.S. Bhalla, “Principle and practices of Management” Kalyani Publishers. 12. T.N. Chhabra, Dhanpat Rai & Co.” Principles and Practices of management ” 13. R.D. Aggarwal, Tata McGraw Hill “Organization and Management” 14. M.C. Shukla “ Business organization and Management” 15. Drucker, Pater F., New York, “ The Practice of Management”. 16. Edwin B. Flippo : Principles of Personnel Management (McGraw Hill) 17. Michael J. Lucius : Personnel Management, (Richard D Irwin Homewood). 18. R.C. Saxena : Labour Problems and Social Welfare (K. Nath & Co. Meerut). 19. Kotler, Philip and Graw Armstrong “Principle of Marketing”.

(New Delhi: Prentice Hall of India) 20. I.M.Pandey, “Financial Management” (Vikas Publishing House Pvt. Ltd.)