Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat) SCHEME OF STUDIES & EXAMINATIONS B.Tech. 3rd YEAR (SEMESTER – VI) MECHANICAL ENGINEERING Credit Based Scheme w.e.f. 2014-15

S. No.	Course No.	Course Title	Teaching Schedule L	T	P	Marks of Class work	Examination Marks Theory	Practical	Total	Credit	Duration of Exam
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:

23. 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.

24. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.

25. Electronics gadgets including Cellular phones are not allowed in the examination

26. 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

ME 302B   DYNAMICS OF MACHINES

B. Tech. Semester – VI (Mechanical Engineering)

L	T	P	Credits		Class Work	:	25 Marks
3	1	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT I

STATIC AN D D YN AMIC FORCE AN ALYSIS: Static force analysis in fou r-bar m echanism and slid er crank m echanism , Internal force analysis, Inertia force in fou r-bar m echanism , Com bined static and d ynam ics force analysis in slider-crank mechanism, Problem

TURN IN G MOMEN T AN D FLYWHEEL: Tu rning m om ent on crankshaft, Tu rning m om ent d iagram s-single cylind er d ou ble acting steam engine, fou r stroke IC engine and m u lti-cylind er steam engine, Flu ctu ation of energy, Flywheel, Problems.

UNIT II

BALAN CIN G OF ROTATIN G COMPON EN TS: Static balance, Dynamic balance, Balancing of rotating m asses, Tw o p lane balancing, Grap hical and analytical m ethod s, Balancing machines-static balancing and d ynam ic balancing machines, Field balancing, Problems.

BALAN CIN G OF RECIPROCATIN G PARTS: Primary and second ary forces and cou p les, Partial balancing, Effects of partial balancing, Balancing of single cylind er engine, balancing of m u lti cylind er; inline; rad ial engines, firing order.

UNIT III

GOVERNORS: Term inology, Centrifu gal governors-Watt governor, Dead w eight governors-Porter & Proell governor, Spring controlled governor-H artnell governor, Sensitivity, Stability, H u nting, Isochronism , Effort and Power of governor, Controlling force diagrams for Porter governor and Spring controlled governors

GYROSCOPE: Precession angu lar m otion and gyroscop ic cou ple and their effects on aerop lane, ship d u ring steering, rolling and pitching, Stability of two wheel and four wheel vehicles moving on curved paths, Problems.

UNIT IV

BRAKE AN D D YN AMOMETERS: Typ es of brakes- external shoe brakes, band brakes, band and block brakes, Braking of vehicle, Types of d ynam om eters-Prony brake, rop e brake d ynam om eters, Belt transm ission dynamometer, torsion dynamometer, Problems.

IN ERTIA FORCES IN RECIPROCATIN G PARTS: Forces on recip rocating p arts of an engine neglecting the w eight of connecting rod , Crankshaft torqu e, Dynam ically equ ivalent system -analytical and grap hical m ethod , Correction couple, Problems.

Text Books:

Theory of Mechanism s and Machines: Am itabha Ghosh and Ashok ku mar Mallik, Third Ed ition Affiliated East-West Press.

Theory of Machines and Mechanism s: Josep h Ed w ard Shigley and John Joseph Uicker, Jr. Second Ed ition, MGH, New York.

Reference Books:

Mechanism and Machine Theory: J.S. Rao and R.V. Dukkipati Second Edition New age International

Theory of Machines: Thomas Beven.

Theory and Machines: S.S. Rattan, Tata McGraw Hill.

Kinematics of Machines-Dr. Sadhu singh, Pearson Education

Note:

In the sem ester exam ination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram m able calcu lator and cellu lar phone will not be allowed.

ME 304B MACHINE DESIGN –II							
B. Tech. Semester – VI (Mechanical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	2	--	5		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

DESIGN ASPECTS: Ergonomic and value engineering considerations in design, design for manufacturability, assembly, interchangeability, Statistical consideration in design, considerations for casting, forging and machining

VARIABLE LOADING: Different types of fluctuating/ variable stresses, Fatigue strength considering stress concentration factor, surface factor, size factor, reliability factor etc., Fatigue design for finite and infinite life Goodman and Soderberg's Criterion, Fatigue design using Miner's equation, Problems.

UNIT II

SHAFTS: Detailed design of shafts for static and dynamic loading, Rigidity and deflection consideration.

SPRINGS : Types of Springs, Design for helical springs against tension and their uses, compression and fluctuating loads, Design of leaf springs, Surging in springs, Design Problem.

UNIT III

BEARINGS: Classification, Design of pivot   and collar   bearing, Selection of ball and roller bearing based on static and   d ynam ic load carrying cap acity, load -life relationship , Selection of Bearings from manu factu rer's catalogu e, Lu bricants and their   p rop erties, Selection of lu bricants, Typ es of lu brication – Bou nd ary, m ixed and hyd rod ynamic lubrication, Design of journal bearings using Raimondi and Boyd's Charts, , Design Problems.

UNIT IV

GEARS: Classification, Selection of gears, Terminology of gears, Force analysis, Selection of m aterial   for gears, Beam & w ear strength of gear tooth, Form   or Lew is factor for gear tooth, Dynam ic load on gear   teeth -Barth equ ation and Bu ckingham equ ation and their com p arison, Design of sp u r, helical, bevel & w orm gear inclu d ing the Consideration for maximum power transmitting capacity, Gear Lubrication, Design Problems.

Text Books :

Mechanical Engg. Design, Joseph Edward Shigley, McGraw Hill Book Co.
Design of Machine Elements, V.B. Bhandari ,Tata McGraw Hill, New Delhi.
Engineering design – George Dieter, McGraw Hill, New York.
Product Design and Manufacturing , A.K.Chitale and R.C.Gupta, PHI, New Delhi.
Machine Design An Integrated Approach: Robert L.Norton, Addison Wisley Longman
Analysis and Design of Machine Elements, V K Jadon, S Verma, I K International
Machine Design, S.G. Kulkarni, TMH , New Delhi.
Design of machine elements-C S Sharma, Kamlesh Purohit, PHI.
PSG design data book
Machine Design Data book by I K International Publication
Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

The Pap er **setter w ill be required to mention in the note in the question paper that the use of only *PSG Design Data book / Machine Design Data book* by I. K. International Publication, New Delhi is permitted.**

ME306B					HEAT TRANSFER		
B. Tech. Semester – VI (Mechanical & Aeronautical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**1**	**--**	**5**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

BASICS CONCEPTS: Thermodynamics Vs Heat transfer, Define Heat Transfer, thermal conductivity Vs diffusivity, basic modes of heat transfer, Combined heat transfer.

STEAD Y STATE HEAT CON D UCTION : Introd u ction, I-D heat cond u ction throu gh a p lane w all, long hollow cylinder, hollow sphere, Conduction equation in Cartesian, polar and spherical co-ordinate systems, Numericals.

UNIT II

STEAD Y STATE CON D UCTION WITH HEAT GEN ERATION : Introd u ction, 1-D heat cond u ction w ith heat sou rces, Extend ed su rfaces (fins)- Fins w ith u niform cross-sectional area, Fin effectiveness, Brief introd u ction of 2-D heat conduction, Numericals.

TRAN SIEN T HEAT CON D UCTION (1-D): Lu m p ed cap acitance, sem i-infinite and infinite solid cond u ction modes for walls, cylinders, spheres; Chart solution, Relaxation Method, Numericals.

UNIT III

CONVECTION: Forced convection -Therm al and hyd ro-d ynam ic bou nd ary layers, Equ ation of continu ity, Mom entu m and Energy equ ations, Internal flow throu gh circu lar tu be and external flow over a flat p late, Flu id friction and heat transfer (Colbu rn analogy), Free convection from a vertical flat p late, Em p irical relations for free convection from vertical and horizontal planes & cylinders, Numericals.

THERMAL RAD IATION : Basic law s, Black bod y rad iation, intensity and em issive p ow er, d iffu se and gray su rfaces, Shap e factors and netw ork analogy, Rad iation shield s, ap p lications to tw o and three su rface enclosu res, introduction to participating media, Numericals.

UNIT IV

HEAT EXCHAN GERS: Classification, Performance variables, Analysis of a p arallel/ cou nter flow heat exchanger, Heat exchanger effectiveness, pressure drop, Numericals.

HEAT TRAN SFER WITH CHAN GE OF PHASE: Lam inar film cond ensation on a vertical p late, Drop -wise cond ensation, Pool boiling regim es, N u cleate boiling and critical heat flu x, film boiling and m inim u m heat flu x, Flow boiling.

Text Books :

Heat Transfer – J.P. Holman, John Wiley & Sons, New York.
Fundamentals of Heat & Mass Transfer–Incropera, F.P. & Dewill, D.P –John Willey New York.
Heat transfer –P.K. Nag, McGraw Hill
Reference Books :
Heat Transfer – A. Bejan, John Wiley & Sons, Inc.
Conduction of Heat in Solids – Carslow, H.S. and J.C. Jaeger – Oxford Univ. Press.
Conduction Heat Transfer – Arpasi, V.S. – Addison – Wesley.
Compact Heat Exchangers – W.M. Keys & A.L. Landon, Mc. Graw Hill.
Thermal Radiation Heat Transfer – Siegel, R. and J.R. Howell, Mc. Graw Hill.
Heat Transmission – W.M., Mc.Adams , Mc Graw Hill.
Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.
The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.
 The paper setter will be required to mention in the note of question paper that the use of Steam tables, Charts, Graphical plots is permitted.

ME 308B	AUTOMATIC CONTROLS					
B. Tech. Semester – VI (Mechanical Engineering)						
L	**T**	**P**	**Credits**		**Class Work**	**: 25 Marks**

3	1	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT-1

INTRODUCTION: Types of control systems ; Typical Block Diagram : Performance Analysis; Representation of Processes & Control Elements – Mathematical Modeling. Block Diagram Representation, Representation of Systems or Processes, Comparison Elements; Representation of Feedback Control systems – Block Diagram & Transfer Function Representation, Representation of a Temperature, Control System, Signal Flow Graphs, Mason's Formula, Problems.

TYPES OF CONTROLLERS: Types of Control Action; Proportional Controller, Integral Controller, Derivative Controller, On-off controller, PD, PID Controller, Hydraulic Controllers; Electronic Controllers; Pneumatic Controllers; Problems

UNIT-II

TRANSIENT AND STEADY STATE RESPONSE: First order system ; Unit Step , Unit Ramp and Unit Impulse Response of First Order system , Second Order System ; Step Response of Second Order System , Delay Time, Rise Time, Peak Time, Settling Time.

FREQUENCY RESPONSE ANALYSIS: Introduction; Closed and Open Loop Transfer Function; Bode Diagram ; Polar Plots; Rectangular Plots; Nichols Plots

UNIT-III

STABILITY OF CONTROL SYSTEMS: Characteristic Equation; Routh's Criterion; Nyquists Criterion, Problems.
ROOT LOCUS METHOD : Introduction; Root Loci of a Second Order System; General Case; Rules for Drawing Forms of Root Loci; Relation between Root Locus Locations and Transient Response; Parametric Variation; Problems.

UNIT-IV

STATE SPACE ANALYSIS OF CONTROL SYSTEMS: Introduction; Generalized State Equation; Techniques for Deriving System State – Space Equations; Transfer Function from State Equations; Solution of State Vector Differential Equations; Discrete Systems; Problems.

CONTROL APPLICATION : Machine Tool Control; Hydraulic Control, NC/ DNC/ CNC Control system , Engine Governing; Mechanical Governors, Hydraulic Governors, Pneumatic Governors, Electronic Governors, Diesel Fuel Ignition Control.

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.

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

ME 310B	MEASUREMENTS AND INSTRUMENTATION		
B. Tech. Semester – VI (Mechanical Engineering)			

L	T	P	Credits		Class Work	:	25 Marks
3	1	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT I

IN STRUMEN TS AN D THEIR REPRESEN TATION : Introd u ction, Typ ical Ap p lications of Instru m ent System s, Fu nctional Elements of a Measurement System, Classification of Instruments, Standards and Calibration.

BASIC STATISTICAL CON CEPTS : Typ es of Measu red Qu antities (Discrete and Continu ou s), Central Tend ency of Data, Mod e, Med ian, Arithm etic Mean, Best Estim ate of tru e Valu e of Data, Measu res of Disp ersion, Range, Mean Deviation, Variance, Stand ard Deviation, N orm al Distribu tion, Central Lim it Theorem , Significance Test, Method of Least Squ ares, Grap hical Representation and Curve Fitting of Data.

UNIT II

STATIC AN D D YN AMIC CHARACTERISTICS OF IN STRUMEN TS: Introd u ction, Accu racy, Precision, Resolu tion, Threshold , Sensitivity, Linearity, H ysteresis, Dead Band , Backlash, Drift, Form u lation of Differential Equ ations for Dynam ic Performance- Zero Ord er, First Ord er and Second ord er system s, Resp onse of First and Second Ord er System s to Step , Ram p, Impulse and Harmonic Functions.

UNIT III

TRAN SD UCER, IN TERMED IATE AN D RECORD IN G ELEMEN TS: Introd u ction, Typ es and Classification of Transd u cers, Selection of Transd u cers, Strain Gau ges and Rosettes, Linear Variable Differential Transform er, Rotary Variable Differential Transform er; Peizo-electric Transd u cers, Op tical Transd u cers and Op to-electric Transd u cers, Mechanical, H yd rau lic and Pneu m atic Am p lifying elem ents, Com p ensators, Data Transm ission Elem ents, Data Acqu isition System s, Data Disp lay and Storage.

UNIT IV

MEASUREMEN T OF MECHAN ICAL QUAN TITIES: Force Measu rem ent: H yd rau lic Load Cell, Pneum atic Load Cell, Elastic Force Devices, Sep aration of Force Com p onents. Torqu e Measu rem ent: Torqu e Reaction Method s and Torqu e Measu rem ent Methods using Sensors. Pressure Measurement: Introductory Review of Moderate Pressure Measurement using Manometers and Elastic Elem ents; Vacu u m Measu rem ent u sing Mcleod , Pirani, Ionisation and Knu d sen Gau ges, H igh Pressu re Measu rem ent, Pressu re Calibration . Flow Measu rem ent: Drag Force Flow Meter, Tu rbine Flow Meter, Electronic Flow Meter, Electro Magnetic Flow meter. Hot-Wire Anemometer. Temperature Measurement: Electrical, Non-electrical and Radiation Methods.

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:

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

Note:

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.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

ME 312B	INDUSTRIAL ENGINEERING						
B. Tech. Semester – VI (Mechanical & Aeronautical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	:	**25 Marks**
3	1	--	4		**Examination**	:	**75 Marks**
					Total	:	**100 Marks**
					Duration of Examination	:	**3 Hours**

UNIT – I

INTRODUCTION: Definition and brief history of industrial engineering, objectives and relevance of industrial engineering for achieving excellence in industry, decisions in industrial engineering.

PRODUCTION SYSTEM AND PRODUCTIVITY: Value addition, products and services, **conversion** process, production system, types of production system, productivity and its measurement, factors effecting productivity and strategies for improving productivity.

WORKFORCE MANAGEMENT: Teams, employee empowerment, quality circles, incentive plans, job design, job specialization, job enlargement, job rotation, job enrichment.

WORK STUDY: Method study, Principles of motion economy, Techniques of method study- various charts, therbligs, Work measurement- various methods, time study, PMTS, determining time, work sampling, numericals.

UNIT II

MANUFACTURING COST ANALYSIS: Elements of cost, overheads estimation, types of cost, cost variance analysis, fixed & variable costs, break even analysis, numericals.

MATERIALS MANAGEMENT: Strategic importance of materials in industries, pressure for high and low inventory, relevant costs, basic inventory control models-EOQ, EBQ with and without shortage, purchase discounts, sensitivity analysis, inventory control systems- P, Q, Ss systems, service level, stockout risk, determination of order point and safety stock, selective inventory control-ABC, FSN, SDE, VED., numericals.

UNIT III

PROD UCTION PLAN N IN G AN D CON TROL(PPC): Introd u ction to forecasting- Sim p le and w eighted m oving average m ethod s, objectives and variables of PPC, Aggregate p lanning- basic concep t and its relation w ith other d ecision areas, Master Prod u ction Sched u le, Sched u ling op erations, variou s m ethod s for line and interm ittent p rod u ction system s, Gantt chart, Sequ encing- Johnson algorithm for n jobs and 2 machines, n jobs & 3 machines, 2 jobs & n machines, n jobs & m machines, Various means of measuring effectiveness of PPC, numericals.

UNIT IV

PRODUCT DESIGN AND DEVELOPMENT: Variou s approaches, Product life cycle, Role of 3S's –Standardization, Simplification, Specialization, Introduction to value engineering, role of ergonomics in product design.

MANUFACTURING STRATEGIES

Intod u ction to JIT, TPM, fu nd am entals of qu ality & TQM, Kaizan- elem ents, benefits and im p lem entation asp ects. Overview of Supply Chain Management, Management Information system (MIS) and its role in decision making.

Text Books

Production and Operations Management by S. N. Chary- TMH

 0 Industrial Engineering and Management by O.P. Khanna- Dhanpat Rai Publications

Reference Books:

1**.** Modern Production Management- S.S. Buffa- John Wiley

 2. Operations Management for comeptitive advantage by Chase-Jacob-Aquilino- TMH

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

HUM- 302 B REPORT WRITING SKILLS							
B. Tech. Semester – VI (Common for all branches)							
L	T	P	Credit		Class Work	:	25 Marks
1	-	--	1		Examination	:	50 Marks
					Total	:	75 Marks
					Duration of Examination	:	2 Hours

OBJECTIVE

The course aims at developing competence for report writing with a focus on its complex writing techniques and procedures.

COURSE CONTENT

UNIT I

Report Writing

Reports: meaning, their importance and types, Structure of reports, Formats of reports, Use of illustrations

UNIT II

Writing of Business and Technical Reports:

Preliminary steps and procedure of writing report, writing various types of reports on technical, business related topics

RECOMMENDED READING

Borowick, Jerome. N. *Technical Communication and its Applications*. New Delhi: PHI, 2000
Gu ffey, Mary Ellen. *Business Communication: Process & Product*. USA: Sou th w estern College Pu blishing, 2000.

Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

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

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.

Qu estion no. 1 w ill be of 10 m arks. The qu estion m ay have tw o/ three p arts w ith enou gh internal choice, covering various components of both the Units.

Qu estion no 2 w ith internal choice w ill be of 10 m arks covering contents of the Unit I. It w ill be theoretical in nature.

Qu estion no 3 w ill have tw o p arts of 15 marks each. The stu d ent w ill be asked to w rite rep orts on bu siness and technical su bject/ issu e covering contents of Unit II. The em p hasis w ou ld be on testing the actual report writing on a given business and technical situation/ subject in letter format.

HUM- 304 B ORAL PRESENTATION SKILLS							
B. Tech. Semester – VI (Common for all branches)							
L	T	P	Credits		Class Work	:	20 Marks
--	--	2	1		Examination	:	30 Marks
					Total	:	50 Marks
					Duration of Examination	:	2 Hours

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 d evising her/ his m ethod , m u st p review and review the stu d ent's sp oken p roficiency at the beginning and end of the sem ester resp ectively to find the efficacy of the cou rse and degree of improvement in the student.

RECOMMENDED READING

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

SCHEME OF END SEMESTER EXAMINATION (Practical)

An external Practical exam of 30 m arks of 2 hou r d u ration for the cou rse w ill be cond u cted by an external examiner appointed by the competent authority of the University's.

NOTE: **Students w ill 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.**

ME 314B	DYNAMICS OF MACHINES LAB					
B. Tech. Semester – VI (Mechanical Engineering)						
L	**T**	**P**	**Credits**		**Class Work**	: 20 Marks
--	--	2	1		**Examination**	: 30 Marks
					Total	: 50 Marks
					Duration of Examination	: 3 Hours

LIST OF EXPERIMENTS:

To perform experiment on Watt Governors to prepare performance characteristic curves.

To perform experiment on Porter Governors to prepare performance characteristic curves.

To perform experiment on Proell Governor to prepare performance characteristic curves.

To perform experiment on Hartnell Governor to prepare performance characteristic curves.

To study the different types of Brakes and Dynamometers.

To study gyroscopic effects on Aeroplane and Naval ship

To find experimentally the Gyroscopic couple on motorized gyroscope and compare with applied couple.

To perform the experiment for static balancing on Static Balancing Machine.

To perform the experiment for dynamic balancing on Dynamic Balancing machine.

Determ ine the tu rning m om ent on crank shaft neglecting w eight of the connecting rod in the recip rocating parts of an engine.

To perform the experiment of balancing of rotating parts and finds the unbalanced couple and forces

To determine experimentally the unbalance forces and couples of reciprocating parts.

Note: 1. **Ten experiments are to be performed in the Semester.**

    At least eight experiments should be performed from the above list. Remaining tw o experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus (ME302B).

ME316B					HEAT TRANSFER LAB		
B. Tech. Semester – VI (Mechanical & Aeronautical Engineering)							
L	T	P	Credits		Class Work	:	20 Marks
--	--	2	1		Examination	:	30 Marks
					Total	:	50 Marks
					Duration of Examination	:	3 Hours

LIST OF EXPERIMENTS:

To determine the thermal conductivity of a metallic rod.

To determine the thermal conductivity of an insulating power.

To determine the thermal conductivity of a solid by the guarded hot plate method.

To find the effectiveness of a pin fin in a rectangular duct natural convective condition and plot temperature distribution along its length.

To find the effectiveness of a pin fin in a rectangular duct under forced convective and plot temperature distribution along its length.

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.

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.

To measure the emissivity of the gray body (plate) at different temperature and plot the variation of emissivity with surface temperature.

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.

To verify the Stefan-Boltzmann constant for thermal radiation.

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.

To determine the critical heat flux using two phase heat transfer apparatus.

To determine the water side overall heat transfer coefficient on a U-tube heat exchanger.

Design of Heat exchanger using CAD and verification using thermal analysis package eg. ANSYS software etc.

Note: **1.**   **Ten experiments are to be performed in the Semester.**

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).

ME 318B			MEASUREMENT AND INSTRUMENTATION LAB				
B. Tech. Semester – VI (Mechanical Engineering)							
L	T	P	Credits		Class Work	:	20 Marks
--	--	2	1		Examination	:	30 Marks
					Total	:	50 Marks
					Duration of Examination	:	3 Hours

LIST OF EXPERIMENTS:

To Study various Temperature Measuring Instruments and to Estimate their Response times.

  0   Mercury – in glass thermometer

  1   Thermocouple

  2   Electrical resistance thermometer

  3   Bio-metallic strip

To stu d y the w orking of Bou rd on Pressu re Gau ge and to check the calibration of the gau ge in a d ead -weight pressure gauge calibration set up.

To stu d y a Linear Variable Differential Transform er (LVDT) and u se it in a sim p le exp erim ental set u p 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 m ethod ology of p ictorial rep resentation of exp erim ental d ata and su bsequ ent calcu lations for obtaining variou s m easu res of tru e valu e and the p recision of m easu rem ent u sing Data acqu isition 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.

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).

GPME 302B			GENERAL PROFICIENCY & ETHICS				
B. Tech. Semester – VI (Mechanical Engineering)							
L	T	P	Credits		Examination	:	75Marks
1	--	--	2		Total	:	75 Marks

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.

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.

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

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

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

Moral values & Ethics

Syllabus - A few topics from the below mentioned books

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.

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:

7	Director/Principal	Chairman
8	Head of the Department/Sr. Faculty	Member
9	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).