INSTITUTE OF TECHNOLOGY
GURU GHASIDAS VISHWAVIDHALAYA
(A CENTRAL UNIVERSITY ESTABLISHED BY THE CENTRAL UNIVERSITY
ORDINANCE 2009, NO:3 OF 2009)
DEPARTMENT OF INDUSTRIAL & PRODUCTION ENGINEERING
STUDY & EVALUATION SCHEME
W.E.F. SESSION 2010-2011

Year: B.Tech. II year
SEMESTER: IV

S.N.	Course	SUBJECT	PERIODS			EVALUATION SCHEME			Credits
			L	T	P	INTERNAL ASSESSMENT	ESE	SUB TOTAL	
(THEORY)									
1.	IPE-241	Material Removal Process	4	0	-	40	60	100	4
2.	IPE-242	Industrial Engineering	4	0	-	40	60	100	4
3.	IPE-243	Machine Drawing	4	0	-	40	60	100	4
4.	IPE-244	Fluid Mechanics	3	1	-	40	60	100	4
5.	IPE -245	Statistical Methods	3	1	-	40	60	100	4
		Total	18	02		200	300	500	20
(PRACATICALS)									
6.	IPE-246	Machine Drawing Lab	-	-	6	45	30	75	3
7.	IPE- 247	Fluid Mechanics Lab	-	-	6	45	30	75	3
		Total			12	90	60	150	06

Total Credits: 26

Total Contact Hour: 32

Total Marks: 650

INTERNALASSESSMENT-(MSE-Mid Semester Examination of 20 Marks, Class   Test/Assignment/Quizzes/Group Discussion etc.)

L-LECTURE, T-TUTORIAL, P-PRACTICAL, CT-CLASS TEST, E.S.E – END SEMESTER EXAMINATION.

Category of Course	Course Code	Course Title	Periods/Week				Theory Paper
			L	T	P	C	
Industrial & Production Engg. B. TECH IV Sem	IPE-241	Material removal process	3	1	-	4	Max Marks-60 Min Marks- Duration-3Hrs

IPE-241   Material removal process

Unit-I

LATHE: lathe design and terminology Specification, types of Lathe: center lathe, capstan and turret lathe, various operations performed on lathe, operating conditions calculation of material removal rate.

DRILLING: fundamental of drilling process, types of drilling machine, types of drills, geometry of twist drill, various operations performed on drilling machine.

BORING; introduction to boring, reaming, tapping and taps, other hole making operations.

Unit-II

MILLING**:** milling machine, milling cutters, milling process: up milling ,down milling, different type of milling operation: end milling ,plain milling ,side and face milling, work holding devices for milling, indexing and types, operating condition, calculation of material removal rate.

BROACHING: introduction to broaching, fundamental of broaching, broaching machine.

SAWING: introduction sawing, sawing blades, types of sawing machine.

Unit-III

SHAPING: introduction to shaping, shaping operation, types of shaping machine, mechanism of quick return motion ,operating conductions, calculation of material removal rate.

PLANNING: Introduction to planning, planning operation, types of planning machine, operating conditions, calculation of material removal rate.

FILING: filling, types of files, filing machine.

Unit-IV

THREAD MANUFACTURING: introduction to thread cutting, production of screw thread by machining, rolling, milling, grinding etc.

GEAR MANUFACTURING: introduction to gear cutting, gear types ,gear manufacturing processes: gear forming, gear shaping ,gear planning, gear hobbling etc, gear finishing ,gear inspection.

Unit-V

WORK HOLDING DEVICES

Introduction to jigs and fixtures, conventional fixtures design ,criteria for work holding ,design steps, clamping consideration, chip disposal, unloading and unloading time, setup and changeover, types of jigs ,clamps, modular fix turning ,group jig and fixture, economic justification of jigs and fixtures.

Recommended books

1. Degarmo etal,Material and process in manufacturing. PHI.
  2.Ghose and mallick,manufacturing science,east west press
3. Jain.R.K. Manufacturing technology
4. P. N. Rao ,manufacturing technology ,metal cutting and machine tools,TMGH
5. R.K.Mittal et al Element of manufacturing process,PHI

Category of Course	Course Code	Course Title	Periods/Week				Theory Paper
			L	T	P	C	
Industrial & Production Engg. B. TECH IVSem	IPE-242	INDUSTRIAL ENGINEERING	3	1	-	4	Max Marks-60 Min Marks- Duration-3Hrs

IPE-242 INDUSTRIAL ENGINEERING

Unit-I Introduction
History & Development of industrial engineering. Productivity definition; means of increasing productivity; work study definition; productivity and work study; Human factor in the fabrication. Work of F.W. Taylor; Frank and Lillian Gilberth and their contribution.

Unit-II Method Study
Definition & basic procedure, selection of jobs, recording technique; micro motion, study; Therbligs; cyclograph and Chronocyclo-graph; principle of motion economy: design of work place layout; analysis in the form of chart; operation chart; flow process chart; flow diagram; string diagram; man machine chart; two hand chart; Simo chart.

Unit-III Work Measurement
Definition, objectives, application, number of cycle to be timed, time study equipment; performance rating; allowances; number of cycle to be studied; determination of standard time; predetermined motion time systems. Conducting work sampling study & establishing standard time.

Unit-IV Wages & Incentives
Characteristics of a good wage or incentive system, method of wage payment. Concept of wage incentive schemes; financial and non financial; Taylor differential piece rate, Halsey premium plane; Merric's multiple piece rate system. Group incentive scheme.

Ergonomics, work space dimension, design of work place, environmental stresses & impacts on human work.

Unit-V
Industrial safety, analysis of cost of accident, horzards in various fields like fire, electrical shocks, chemical, organization for safety, plant safety, govt. legistion for safety, safety rules.

Recommended Text Books:
1. I.L.O., "Introduction to work study", Oxford Press.
2. Mundel, "Motion and time study", Prentices Hall India, 1995
3. Ralph M. Barnes, "Motion and Time Study", John wiley and sons, 1990
4. Industrial Engineering by M.I.Khan, New Age International Publication

Category of Course	Course Code	Course Title	Periods/Week				Theory Paper
			L	T	P	C	
Industrial & Production Engg. B. TECH IVSem	IPE-243	MACHINE DRAWING	3	1	-	4	Max Marks-60 Min Marks- Duration-4Hrs

IPE-243 MACHINE DRAWING

UNIT-I
Machining symbol, surface roughness grades, materials symbols, welding joints & symbols, screw threads & screw fastening, different types of thread profile & nuts, bolts, rivet & riveted joints, laps & butt, joint with single & double straps.

UNIT-II
Sectional views: keys, cotter joints, knuckle joints, shaft coupling, flanged coupling, different types of shaft coupling, shaft bearing, bushed bearing, plumber block, foot step bearing.
Pulleys: fast & loose pulleys, stepped pulley's belt pulley, rope pulley.
Spur gearing, drawing of teeth profile of spur gear, rake & pinion, gear in mesh, cycloidal tooth profile.

UNIT-III
Assembly drawing of Engine parts like piston, stuffing box, cross-heads, eccentrics, connecting rod: Assembly drawing of stop valve, feed check valve, safely valve, blow off cock.
Assembly drawing of lathe tail stock post.

Text Books and References Books:

1. Bhatt.N.D. Machine Drawing, Charotar Publication House
2. Gill.P.C. Machine Drawing, Kataria & Sons
3. Dhawan RK. Machine Drawing

Category of Course	Course Code	Course Title	Periods/Week				Theory Paper
			L	T	P	C	
Industrial & Production Engg. B. TECH IVSem	IPE-244	FLUID MECHANICS	3	1	-	4	Max Marks-60 Min Marks- Duration-3Hrs

IPE-244 FLUID MECHANICS

UNIT – I Properties of Fluid

Fluid ideal and real fluid, properties of fluid, mass density, weight density, specific volume, specific gravity, viscosity, surface tension, capillarity, vapour pressure, compressibility and bulk modules, Newtonian and non-Newtonian fluids.

Fluid Statics

Pressure, Pascal's law, Hydrostatic law, Pressure measurement, Hydrostatic force on submerged surface and curved surface, law of buoyancy and flotation.

UNIT – II Fluid Kinematics

Description of fluid motion, Langragian and Eulerian approach, types of fluid flow, types of flow lines-path line, streak line, stream line, stream tube acceleration of a fluid particle, rotational flow, rotation and vorticity, circulation, velocity function, stream and potential function, flow net, its characteristics and utilities. Control volume and surface concept.

UNIT – III Fluid Dynamics

Conservation of Mass: Continuity equation, conservation of momentum, momentum theorem, Euler's equation, Bernoulli's equation and its practical application, Venturimeter, Orifice meter, Nozzle, Pitot tube, Rotameter, notches and weirs.

UNIT – IV

Turbulence: basics of Turbulence, Reynolds stresses, Prandtt's mixing length hypothesis, friction velocity, laws of walls.

Dimensional Analysis and Similitude: methods of dimensional analysis, Rayleigh's method, Buckingham's theorem, dimensional number and their significance, concept and types of physical similarity, dynamic similarity, applications of dynamic similarity.

UNIT – V Viscous Flow

Flow through circular pipes, flow between two parallel plates, loss of head due to friction in viscous flow. Kinetic energy corrections & momentum correction factors.

Flow Through pipe: major & minor loss in pipe, Hydraulic gradient and total energy line, pipe in series and parallel, equivalent pipe, power transmission through pipe, water hammer in pipes.

Text Books and References Books:

    1. Streeter & Wyils,McGrawHill Fluid Mechanics

    2. S.K. Som, C.Biswas,PHI Publications Fluid Mechanics & Machines

    3. I.Shames, PHI Publications Fluid Mechanics.

    4.Fluid Mechanics & Machines by Bansal, Dhanpat Rai Publications

Category of Course	Course Code	Course Title	Periods/Week				Theory Paper
			L	T	P	C	
Industrial & Production Engg. B. TECH IVSem	IPE-245	STATISTICAL METHODS	3	1	-	4	Max Marks-60 Min Marks- Duration-3Hrs

IPE-245   STATISTICAL METHODS

Unit I ---Introduction to statistics , mathematical statistics , variable , frequency distribution , exclusive and inclusive class intervals type of series graphical representation histogram frequency polygon Ogive measure of central tendency variation type of average, Mean median mode for grouped and un grouped data , geometric mean , harmonic mean , measure of description Skewness and Kurtosis.

Unit II -- curve fitting and Method of least square – straight line parabola correlation – scatter cliagrem's Karl Pearson's coefficient of correlation. Limits for correlation coefficient. Coefficient of correlation for bivariate frequency distribution, rank correction. Regression linear regression, Equation to the line of Regression. Regression coefficient, Angle between two lines of Regression

Unit III --   Theory of Probability – Mathematical and statistical definition of probability Sample space finite sample space sample point, Events Theorem of total probability. Sample and compound event. Conditional probability. Theorem of compound probability. Boy's theorem. Use of binomial theorem.

Unit IV Theoretically Distribution – Binomial Distribution Mean, Standard deviation and Pearson's β and γ coefficient. Poisson distribution, mean, variance normal Distribution.

Unit V Random and simple sampling – mean and standard deviation in simple sampling of attribute test of significance for large sample test of significance based on Chi square, T, F, and Z Distribution Degree of freedom, condition for applying

Reference book:

1. Mathematical Statistics by M. Ray

2. S. C. Gupta and Kapoor – Fundamental of Mathematical Statistic

3. A.A. AFFI – Statistic Analysis

4. Goon –Gupta - Mathematical Statistics

5. Probability & Statistics by Biswal, PHI Publications