Table of Content

PROGRAMME TITLE: Diploma in CE/CO/EC/IF/IS/EE/LG/LT

Course Code	Course Title	C/O	Pre-requisite	Credits				Examination Scheme					
				TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
HU 11 102	Communication Practice	C	Nil	-	2	-	2	--	--	--	-- 50-		50

1. The assessment of practical, oral, term work is internal except mark (*).
2. (*) The assessment is internal .
3. C = Compulsory, O = Optional

Rationale:

The medium of instruction in the technological field is English, so it is necessary for the students of Engineering and Technology to learn and express through English language. These students are the future technicians, must be able to face the interview, handle the questions and present them in a proper way, acquire confidence to participate in the group discussion., introduced with the modern communication technology and be able to use these medias for effective communication. Besides ,the students should have the basic knowledge of phonetics and its correct use in the communication practice.

Objectives:

The students will be able to : 1) Acquire the practical knowledge of interview.

2) Speak in English with confidence.

3) Handle the new techniques of communication.

4) Participate in group discussion.

5) Learn phonetics, tone and intonation.

Topic No	Contents
1	**Interview Skills and Group Discussion :** 1.1. Introduction 1.2. Types of Interview 1.3. Preparing for an Interview 1.4. Mock Interview 1.5. Interview questions and handling technique
2	**Group Discussion** 2.1 Aspects of body language (Kinesics) 2.2 Preparing for group discussion 2.3 General Knowledge 2.4 Leadership qualities 2.5 Practice Session

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3	**Role of Oral Presentation in the Career of an Engineer** 3.1 Use of facial expressions 3.2 Use of eye contact 3.3 Means to overcome stage fear 3.4 Preparing a speech 3.5 Pace, tone and intonation
4	**Introduction to Modern Communication :** 4.1 Technology based communication 4.2 Telephone / Mobile and Voicemail 4.3 Computers and Internet 4.4 Positive and negative impact of technology enabled communication 4.5 Selection of appropriate communication technique
5	**Phonetics** 5.1 Speech organs and their functions 5.2 Basic Sounds of English 5.3 Vowels and Consonants 5.4 Intonation 5.5 Word Stress and Word Accent

Reference Books:

Sr.No.	Author	Title	Publication
1	Wendy Carter	Communication Skills	Hardridge Consulting Groups Ltd.
2	Barun K Mitra	Effective Technical Communication	Himalaya Publication House.
3	Meenakshi Raman Sangita Sharma	Communication Skills—Mumbai University	Oxford Higher Education

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Programme Code : CE / ME											
Course Code : SC 11 107					Course Title : ENGG PHYSICS						
Prerequisite : Nil					C / O : Compulsory						
Credits				Duration of Written Examination		Examination Scheme					
TH	TU	PR	TOTAL	TH	TS	TH	TS	PR	OR	TW	TOTAL
04	-	02	06	3 hrs	2 Tests of 1 Hour each	80	20	-	-	50	150

1. Theory paper duration 3 hrs.
2. Theory paper assessment is internal and external.
3. The assessment of practical, oral, term, work is internal except mark (*).
4. (*) The assessment is internal and external.
5. C = Compulsory, O = Optional

RATIONALE:-

The subject is included under the category of Engineering sciences. The role is to understand the fundamental concept and facts about infrastructures of physical matters and their inter relationships. This will provide input for better understanding of other foundation and technology subjects.

Every unit is presented in a simple language taking into consideration the technical & scientific need The emphasis is to understand all concepts & facts used to develop different aspects as per the need in society. Engineering, being the science of measurement and design, has been offspring of physics that plays the primary role in all professional disciplines of Engineering. The different topics of physics like measurement, vectors & scalars types of motion , gravitation, viscosity, elasticity, surface tension, sound & acoustics, optics, photoelectricity, LASER, etc provides fundamental facts, principles laws & proper sequence of events to streamline Engineering knowledge

OBJECTIVES: - Students will be able to

1. derive the unit of physical quantity .
2. understand the physical properties of various materials.
3. understand the laws of vectors.
4. apply the knowledge of wave motion in acoustical planning.
5. adopt the methods of preventions with justification.
6. understand basic concepts of physics viz. surface tension, gravitation , gas laws & specific heats, viscosity , thermal conductivity, elasticity and apply them in elementary engineering application
7. understand basic concept in photoelectricity, LASER, refraction, reflection
8. develop laboratory skills of investigation for use in production system

Section I
(40 marks)

Table of Contents:

Unit	Theory	Hrs.	Marks
1	**Physical measurement**	04	05
	1.1 Fundamental Physical quantities, examples. 1.2 Derived physical quantities, examples. 1.3 System of units, C. G. S., M. K. S., S. I. system. 1.4 Rules and conventions. 1.5 Errors in Measurements, types of errors. Minimization of errors.		
2	**Vectors and Scalars**	05	06
	2.1 definition of Vectors, scalars 2.2 resultant vectors 2.3 Unit vectors, resolution of vector. 2.4 triangle law of vectors 2.5 parallelogram law of vectors, 2.6 scalar product and vector product		
3	**Circular Motion**	05	06
	3.1 Uniform circular motion. 3.2 Relation between linear and angular Velocity. 3.3 Radial acceleration 3.4 Centripetal and Centrifugal force , examples. 3.5 Banking of Roads.		
4	**Simple Harmonic Motion**	04	05

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	4.1 S. H. M. as projection of circular Motion. 4.2 Definition and unit of parameters related to S. H. M. ;oscillation, phase, amplitude, period, frequency 4.3 Velocity and acceleration in SHM.		
5	**Gravitation**	04	06
	5.1 Newton's law of gravitation. 5.2 Acceleration due to gravity. 5.3 Critical velocity and escape velocity. 5.4 Period of artificial satellite. 5.5 Communication Satellite. 5.6 weightlessness in satellite		
6	**Viscosity**	06	06
	6.1 Concept and Definition of viscosity. 6.2 Newton's law of viscosity, Co-efficient of viscosity 6.3 Stoke's law, terminal velocity 6.4 Derivation of viscosity of liquid by stokes method. 6.5 Streamline flow, turbulent flow, critical velocity 6.6 Reynolds number 6.7 Applications		
7	**Surface Tension**	04	06

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	7.1 Concept of surface tension. 7.2 Adhesive and cohesive forces. 7.3 Angle of contact. 7.4 Rise of liquid in capillary tube. 7.5 Effect of impurity and temperature 7.6 Applications	

Section II

(40 marks)

Table of Contents:

8	**Elasticity**	04	06
	8.1 Definition of elasticity, stress, strain, 8.2 Types of deformation. 8.3 Hooke's Law and elastic limit. 8.4 Definition and explanation of bulk modulus, young's modulus and modulus of rigidity. 8.5 Behaviour of wire under continuously increasing load, yield point, breaking point. 8.6 Factor of safety		
9	**Heat Transfer and thermal conductivity**	04	06
	9.1 Modes of transfer of heat ; conduction , convection, radiation. 9.2 Conduction of heat along a bar, steady state of temperature. 9.3 Cooefficient of thermal conductivity		
10	**Gas laws and specific heats**	04	06

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	10.1 Concept of Heat and temperature . 10.2 Boyle's law, Charle's Law , Gay Lussac's law. 10.3 Concept of absolute zero temperature, Kelvin scale of temperature. 10.4 Ideal & general gas equation, Universal gas constant. 10.5 Work done in expanding gas at constant pressure. 10.6 Specific heats of gases (C_p, C_v). Relation between specific heats. (Mayer's relation)		
11	**Sound and Acoustics**	06	06
	11.1 Introduction 11.2 Equation of progressive wave 11.3 Newton's formula for velocity of sound 11.4 Effect of temperature , pressure & humidity on velocity of sound 11.5 Acoustics definition 11.6 Sabine's formula 11.7 Acoustical planning of building		
12	**Optics**	04	06
	12.1 Reflection and refraction of light through glass prism. 12.2 Angle of prism, angle of incidence, angle of emergence 12.3 Angle of deviation - Definition and its dependence on angle of incidence.		

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	12.4 Angle of minimum deviation : $A+\delta m = i + e$ Derivation of Prism formula $\mu = \frac{\sin\{(A+\delta m)/2\}}{\sin(A/2)}$		
13	**Photoelectric effect**	**06**	**06**
	13.1 Concept of quantum theory of light. 13.2 Einstein's photoelectric equation. 13.3 Characteristics of photoelectric effect. 13.4 Construction of photoelectric cell.		
14	**LASER**	**04**	**04**
	14.1 LASER introduction 14.2 Properties of laser. 14.3 Spontaneous and stimulated emission. 14.4 Population inversion. 14.5 Pumping method. 14.6 He-Ne Laser, construction and working		

Numerical problems are integral part of syllabus

List Of Practicals:-

Exp.1) To use vernier caliper for measurement of length & diameter of given object.

Exp.2) To use Micrometer Screw gauge for measurement of diameter & thickness of given small objects

Expt.3) Determination of acceleration due to gravity (g) by simple pendulum.

Expt.4) Determination of coefficient of viscosity of oil by Stoke's method.

Expt.5) Determination of surface tension by capillary rise method using travelling microscope.

Expt. 6) Determination of Young's modulus by Searle's method.

Expt.7)To verify Boyle's law

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Expt.8) To calculate coefficient of absorption for acoustical material.

Expt.9) Determination of refractive index of prism by pin method.

Expt.10) Plot characteristics of photoelectric cell.(Photoelectric current /Intensity of light & voltage applied)

Expt.11) To verify properties of LASER.

Sr.No.	Author	Title	Publication
1	Prakash Manikpure	Applied Physics	S.Chand
2	A. S. Vasudeva	A Textbook of Engineering physics	McGraw Hill
3	R.K.Gaur & S.L.Gupta	Engg.Physics	Dhanpat Rai & Sons
4	M. N. Avadhanulu	Basic Engineering Physics	McGraw Hill
5	Gaikwad, Bhangale, Narkhede, Morankar	Basic Physics	S. Chand
6	C. L. Arora	A Textbook of Modern Physics	McGraw Hill
7	Physics – 11th & 12th std - science textbook		

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Programme Code : CE/ME											
Course Code : SC 11 117						Course Title : Engineering Mathematics					
Prerequisite : SC 11 116						C / O : **Compulsory**					
Credits				Duration of Written Examination		Examination Scheme					
TH	TU	PR	TOTAL	TH	TS	TH	TS	PR	OR	TW	TOTAL
3	1	-	4	3 hrs	2 Tests of 1 Hour each	80*	20	-	-	-	100
(*) indicates assessment by Internal and External examiners											

Rationale: The subject is intends to teach students basic facts, concepts, principle &procedure of mathematic as a tool to analyze

Engineering problems & as such lays down foundation for understanding the engineering & core technology

subjects

Objectives:

The Students will be able to ,

1. Understand basic facts of mathematics about the field analysis of any Engineering Problem.
2. Know the standard ways in which the problem can be approached.
3. Apply basic concepts to engineering problem.

Section –I (Marks 40)		
Contents :-	**Hrs.**	**Marks**
1. Function 1.1 Concept of function, domain and range, type of functions (Only definitions). 1.2 Even & Odd functions. 1.3 Value of the function	**04**	**06**
2. Limit 2.1 Concept of limit 2.2 Limit of functions- i) Algebraic, ii) Trigonometric, iii) Logarithmic and iv) Exponential.	**08**	**10**

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3. Derivatives 3.1 Definition of the derivative, 3.2 Derivatives of standard function. (No proof by first principle) 3.3 Differentiation of sum, difference, product and quotient of two or more functions 3.4 Differentiation of composite, inverse, implicit, parametric, exponential and logarithmic functions, 3.5 Second order derivative.	13	16
4. APPLICATION OF DERIVATIVES **4.1** Geometrical meaning of derivative **4.2** Tangents & Normals to the curve, 4.3 Maxima & minima of the functions 4.4 Velocity & acceleration 4.5 Radius of Curvature.	07	08

Section –II (**Marks 40**)		
Contents :-	Hrs.	Marks
5. STATISTICS 5.1 Basic definitions-raw data, variate,frequency,cumulative frequency 5.2 Classification of data, class interval, mid value, length of the interval 5.3 Measure of central tendency – mean, median & mode 5.4 Mean deviation, Standard deviation, Coefficient of variance	13	16
6. Complex number 6.1 Definition & Algebra of complex numbers Geometrical representation of complex number, Modulus & amplitude of complex number, Polar form of complex number 6.2 De moivre's theorem (no proof) , roots of complex nos. Exponential form of complex number, Circular & Hyperbolic functions of complex numbers, relation between Circular & Hyperbolic functions, real & imaginary parts of Circular & Hyperbolic functions	11	12
7. VECTOR 7.1 Defination of vector, position of vector, unit vector, Algebra of vector (Equality,addition,subtraction and scalar multiplication), Dot (scalar) product & vector (cross) product with properties, projection of vector. Application of vectors: Work done & momentum of force about point & line.	08	12

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References:

Sr.No.	Author	Title	Publication
1	Shri. S. P. Deshpande,	Mathematic for Polytechnic Students	Pune Vidyarthi Griha
2	H. K. Dass.	Mathematic for Engineers (Vol.-I)	S. Chand
3	Shri Shantinarayan	Engg: Maths Vol I & II	S. Chand and Comp
4	B.S.Grewal	Higher Engineering Mathematics.	Khanna Publication

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Programme Title: **Mechanical Engineering**											
Course Code : **WS 11 201**						Course Title : **Workshop Practice**					
Prerequisite : **Nil**						C / O : **Compulsory**					
Credits				Duration of Written Examination		Examination Scheme					
TH	TU	PR	TOTAL	TH	TS	TH	TS	PR	OR	TW	TOTAL
-	-	4	4	-	-	-	-	-	-	50	50
(*) indicates assessment by Internal and External examiners.											

Rationale:

It is one of the important foundation courses. It describes facts, concepts and techniques of production. It gives knowledge about the various manufacturing processes such as smithy, forging, turning, carpentry, fitting, plumbing, sheet metal and joining. The demonstration of CNC machine will give fill of advancement in the industry. There is improvement of various skills while working on different machines. The understanding of these processes and skill is helpful to almost all the branches of Engineering.

Objectives:

The students will be able to

1. Know the working of various tools used in Carpentry, Smithy, Fitting, plumbing, welding and sheet metal work section.
2. Use the various tools used in the various sections.
3. Use these techniques in manufacturing various articles.

Term Work:

At the beginning of the term respective instructors should show working of all the tools and equipments used in their section. Student should draw the sketches of all the tools used in the workshop in their journal and would write the description and applications of them. Journal should be submitted along with the other jobs for the final assessment at the end of the term.

Topic No	Contents	Hours
1	**SMITHY AND FORGING (Any One Job)** 1. One job involving bending and setting down operation. 2. One job consisting of three operations bending, setting down, and upsetting. E.g. Pegs (Square, Round) Hook, Hammer tongue etc. 3. One job consisting of above operations useful for the department or institute.	12
2	**CARPENTRY SECTION. (Any one Job)** 1. One job involving two types of joints such as Tenon and Lap joint. 2. One job on wood turning. E.g. Duster, square tool, Tee-poy, Chourang, Tray, Switch board, Pen stand etc. 3. One job consisting of above operations useful for the department or institute like desks, dies, black board, window, doors, stool tops etc.	12
3	**WELDING SECTION (Any One Job)** 1. One job on Electric Arc Welding consisting of Lap joint and Butt joint. 2. One job on pipe joint. 3. One job consisting of above operations useful for the department or institute like Chairs, Table, garden racks, Window grills, tree guards, stools, containers etc	10
4	**FITTING SECTION (Any One Job)** 1. Any one job consisting of drilling and tapping operation. 2. One job involving male and female joint. 3. One job consisting of above operations useful for the department or institute. like paper weight, hand vice, grills fork spanner ,etc.	14

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5	**PLUMBING AND SHEET METAL WORKING (Any one Job)** 1. One job involving pipe threading. 2. One job involving coupling and elbow. 3. One job involving sheet cutting and sheet bending operations. E.g. Tray, cover of small electronic devices etc. 4. One job consisting of above operations useful for the department or institute.	10
6	**TURNING SECTION (DEMONSTRATION ONLY)** Demonstration of working of Lathe Machine (Group Demonstration) **Term work-** Student shall visit the turning section and see the working of Lathe Machine, and explain the working of Lathe Machine with simple diagram in Journal.	03
7	**CNC SECTION (DEMONSTRATION ONLY)** Demonstration of working of CNC Lathe or CNC Milling machine (Group Demonstration) **Term work-** Student shall visit the CNC Lab and see the working of CNC lathe or CNC milling machine, and explain the working of CNC machine with simple block diagram in Journal.	03

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PROGRAMME TITLE: CE/ME/EE

Course Code	Course Title	C/O	Pre-requisite	Credits				Examination Scheme					
				TH	TU	PR	Total	TH	TS	PR	OR	TW	Total
AM 11 201	Engineering Mechanics	**Compulsory**	**Nil**	4	-	2	6	80	20 (2 Tests of 1 Hour each)-	--	--	50	150

1. Theory paper duration 3 hrs.
2. Theory paper assessment is internal and external.
3. The assessment of practical, oral, term, work is internal except mark (*).
4. (*) The assessment is internal and external.
5. C = Compulsory, O = Optional

Rationale:

The branch of Applied science that deals with state of rest or the state of motion is termed as Mechanics. Starting from the analysis of rigid bodies under gravitational force and simple applied forces the mechanics has grown to the analysis of robotics, aircrafts, spacecrafts under dynamic force, atmospheric forces, temperatures forces etc.

The mechanics can be grouped as

i) Classical mechanics / Newtonian Mechanics
ii) Relativistic mechanics
iii) Quantum Mechanics/ Wave Mechanics

The principal of mechanics developed around state of rest and state of motion of the bodies by sir Issac Newton which is termed as three laws of motion and the laws of gravitation. The mechanics based on these laws is called classical mechanics or Newtonian mechanics. Albert Einstein proved that Newtonian mechanics fails to explain the behavior of high speed (speed of light) bodies. He put forth the theory of Relativistic mechanic Schrodinger(1887-1961) and Broglie (1892-1965) showed that Newtonian mechanics fails to explain the behavior of particles when atomic distances are concerned. They put forth the theory of Quantum Mechanics.

Engineers are keen to use laws of mechanics to actual field problems. Application of laws of mechanics to field problems is termed as Engineering mechanics. Here the students will learn the laws and principals of mechanics along with their applications to engineering problems. As a matter of fact knowledge Engineering mechanics is very essential for an engineer in planning, designing and construction of his various types of structures and machines, so that the design is safe and economical. .

Objectives: The student will be able to

1. Understand concepts of mechanics involving force & its effects on objects, motion of bodies, and friction with applications.
2. Apply the principles to Engineering problems
3. Understand principles of simple machines

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Section –I
(40 Marks)

Topic No	Contents	Hrs.	Marks
1	**Introduction** Basic terms/ concepts as given below 1.1 Scalar and vector 1.2 Body and rigid body 1.3 Statics , dynamics, kinetics , kinematics and Newton's Law of motion 1.4 Forces and systems of forces – coplanar, non coplanar, concurrent, non-concurrent, parallel, co- linear, like parallel & unlike parallel. 1.5 Effects of force on a body. 1.6 Characteristics of forces.	03	02
2	**Force** 2.1 Principle of transmissibility of forces, 2.2 Representation of force, Composition and resolution of forces Resultant of Force, analytical methods for resultant force, 2.3 Law of triangle of forces, parallelogram law of forces, Polygon law of forces 2.4 Compositions of coplanar , concurrent , non-concurrent, parallel forces by analytical method. 2.5 Moment of forces, Varignon's theorem of moments, couple and properties of couple.	09	12
3	**Equilibrium** 3.1 Concept and definition of equilibrium , equilibrant force and conditions of equilibrium (Analytical method only) 3.2 Lami's theorem and its application , numerical problems based on lami`s theorem. 3.3 Type of Supports 1. Simple 2. Roller 3. Hing 4.Fixed 3.4 Beam reaction subjected to concentrated loads and U.D.L and beam supported on above four type of supports only.	10	14
4	**Friction** 4.1 Concept of friction , types of friction, laws of friction, coefficient of friction , angle of friction, static and dynamic friction. 4.2 Body resting on horizontal plane. 4.3 Inclined planes , body resting on inclined plane and forces acting on the body in any direction , angle of repose . 4.4 Ladder friction	10	12

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5	**Section-II** **Centroid & Center of Gravity** 5.1 a Definition & concept of centroid & center of gravity 5.2 a Centroid of straight line, triangle, rectangle, circle, Semicircle,quarter circle, trapezium. 5.3 a. Centroid of hollow sphere and hollow cylinder, Hollow cone. 5.4 a. Problem on finding centroid of compound figures Consisting of regular figures stated in 5.2 a. and 5.3 a 5.1 b Center of gravity for simple solids as cylinder, sphere, cone, hemisphere. 5.2 b Center of gravity for compound solid object made up of solid stated 5.1b.	08	10
6	**Kinetics** 6.1 Newton's laws of motion 6.2 Concept and definition of momentum , impact , impulse, law of conservation of momentum, impulsive force. Problems based on it. 6.3 Force, mass, acceleration, problems on bodies connected by means of string , tension in the string, acceleration of system , motion of a lift numerical . problems based on rectilinear motion 6.4 Work – power –energy : Definitions, units, graphical representation of work Energy ,Different forms of energy ,law of conservation of energy , numerical problems related to Newton's laws of motion and work , power, energy.	10	12
7	**Angular Motion** 7.1 Introduction and definition of Angular velocity, Angular acceleration, Angular displacement 7.2 Motion of rotation under constant Angular acceleration 7.3 Relation between linear motion and angular motion 7.4 Linear (or Tangential) Acceleration of a Rotating Body. 7.5 Motion of Rotation of a Body under variable Angular Acceleration.	08	08
8	**Simple lifting machines** 8.1 Concept of machine, simple machine and compound machine 8.2 Definition of lifting machine, mechanical advantage, load, effort, ideal effort, effort lost in friction, Load in lost in friction, velocity ratio, efficiency of machine, reversible machine, input/output, friction in the machine, ideal machine. 8.3 Study of relationship between. i) Load against effort./law of machine ii) Load against efficiency iii) Load against ideal effort iv) Load against M.A. for the Lifting machines. 8.4 Numerical problems for the Lifting machines (of Part II of Practical only.)	06	10

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List of Practical:

Part :- I Practical (Any Four Minimum)

1) Verification of the law of polygon of forces
2) Verification of the equilibrium of the parallel forces (beams)
3) Verification of the Lami's theorem
4) Verification of law of moment
5) Co-efficient of friction between different surfaces

Part :- II Practical (Any Four Minimum)

1) Simple screw jack
2) Worm and worm wheel
3) Differential axle and wheel
4) Single purchase crab
5) Two sheaves pulley block
6) Double purchase crab
7) Three sheaves pulley block

Part :- III

Four half imperial size sheet containing graphical solutions of two problems based on each :-

1) Co planar concurrent forces
2) Co planar non concurrent forces
3) Co planar parallel forces
4) Reaction of beams subjected to vertical loads and inclined loads and u.d.l

References:

Sr. No	Author	Title	Publication
1	R.S.Khurmi	Engineering mechanics	S. Chand publication,Mumbai,Maharashtra
2	Walavalkar	Applied mechanics	Sarita Prakshan Pune
3	D.P.Nathe	Engineering mechanics	S. Chand & Company LTD. New Delhi
4	S.S Bhavikatti	Engineering mechanics	New Age International Publishers

Head of Department
(Civil Engineering)

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Programme Code : **Mechanical Engineering**											
Course Code : **ME 11 203**				Course Title : **Engineering Drawing - II**							
Prerequisite : **Nil**				C / O : **Compulsory**							
Credits				Duration of Written Examination		Examination Scheme					
TH	TU	PR	TOTAL	TH	TS	TH	TS	PR	OR	TW	TOTAL
3	-	4	7	4 hrs	2 Tests of 1.5 Hour each	80	20	-	-	50	150
(*) indicates assessment by Internal and External examiners.											

Rationale:

Engineering drawing is the graphical language of engineers. It describes the scientific facts, concepts, principles and techniques of drawing in any engineering field to express the ideas, conveying the instructions, which are used to carry out jobs in engineering field. This course in engineering drawing aims for building a foundation for the further course in drawing and other allied subject.

Objectives:

The students will be able to,

- Effectively use drawing instruments for enhancing speed and accuracy in drawing.
- Draw orthographic views of complicated components.
- Draw isometric view of components with taper and slots.
- Develop the imagination and importance of accuracy and precision.
- Appreciate use of computers in drafting.
- Revise AutoCAD commands learnt previously.

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Section –I (Marks 40)		
Contents:	**Hrs.**	**Marks**
1. Sections of Solids 1.1 Different Types of Solids to be considered are Prism, Pyramid, Cone, Cylinder, Tetrahedron, and Cube. 1.2 Cone, Pyramid and Tetrahedron resting on their base on HP. 1.3 Prism, Cylinder & Cube :- a) Axis parallel to both the reference Planes. b) Resting on their base on HP. 1.4 Section plane inclined to one reference plane and Perpendicular to other. (Use first angle method of projections)	06	12
2. Development of Surfaces 2.1 Developments of lateral surfaces of cube, prisms, cylinder, pyramids, cone and their application such as tray, funnel, Chimney, pipe bends etc.	8	12
3. Intersections of Solids 3.1 Curves of intersection of the surfaces for Prism with prism, cylinder with cylinder & prism with cylinder when, (i) The axes are at 90^0 and intersecting & (ii) The axes are at 90^0 and offset. 3.2 Cylinder with cone when axis of cylinder is parallel to both the reference planes and cone resting on base on HP and with axis intersecting and offset from axis of cylinder.	10	16

Section –II (Marks 40)		
Contents:	**Hrs.**	**Marks**
4. Missing Views 4.1 Drawing of missing view from given two orthographic views. 4.2 Higher level problems are to be discussed. (Use First angle method of projections)	10	16
5. Auxiliary Views 5.1 Study of Auxiliary plane, projection of objects on auxiliary planes. 5.2 Completing the auxiliary views with help of given regular views (Use first angle method of projection)	8	12
6. Freehand sketches Freehand sketches of the following components: 6.1 Sunk key, saddle key, taper key, woodruff key, cone key, etc. 6.2 Flange, muff, flexible, universal & Oldham's coupling. 6.3 Cotter and knuckle joint. 6.4 Pulleys for flat belt & V- belt, Fast & loose pulley & Cone step pulley.	6	12
7. Introduction to AUTOCAD software Demonstration of AUTOCAD software. Revision of 2D drafting. (Draw, Modify, Display, Dimension and Miscellaneous command)	-	-

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List of practicals:-

Sheet 1 :- Sections of Solids (2 Problems)

Sheet 2 :- Development of Surfaces. (2 Problems on regular solids)

Sheet 3 :- Development of Surfaces. (2 problems on applications)

Sheet 4 :- Intersections of surfaces. (Two problems on regular solids combinations)

Sheet 5 :- Intersections of surfaces. (Two problems on machine parts)

Sheet 6 :- Advanced missing views (Two problems on machine parts)

Sheet 7 :- Auxiliary Views (2 Problems)

Sheet 8 :- Proportionate free hand sketches.

REFERENCES:

Sr. No.	Author	Title	Publication
1	Prof. N. D. Bhatt	Engineering Drawing.	Charoter Publishing House, Anand,Gujrat.
2	Prof. N. D. Bhatt	Machine Drawing.	Charoter Publishing House, Anand,Gujrat.
3	Prof P. J. Shah	Engineering Drawing.	S. Chand publication.
4	Tresion	Fundamentals of Engg. Drawing.	Tata Mc. Graw – Hill.
5		I.S.9609 – 1983 Engg. Lettering of Technical Drawing.	
6		I.S 10711 – 1983 Sizes of drawing sheets.	
7		I.S. 10713 – 1983 Scale for use in technical drawing.	
8		I.S. 10714 –1983 General principles of presentation of technical drawings.	
9		S.P. 46 – 1988 Engg. Drawing practice for school & colleges.	

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