

COMMUNICATION SKILL –II

L T P
2 0 2

Curri. Ref. No.: G102

Total Contact Hrs.: **Total Marks: 125**

Lecture: 30

Tutorial: 0

Practical: 30

Pre-requisite: G101

Credit : 4

Theory:

End Exam : 70

P.A.: 30

Practical:

P.A. : 25

RATIONALE

This subject will help to identify essentials of business correspondence. It will enable the learner to use them more confidently in their communicative activities. Learners will be able to write letters asking for application forms, fill in the application forms. They will be able to prepare a resume or a CV, write letters of application in response to advertisements, learn how to write technical reports, memos and they will be able to prepare themselves for job interview and group discussion.

DETAIL COURSE CONTENT

THEORY :

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 ESSENTIALS OF BUSINESS CORRESPONDENCE	3
1.1 Introduction	
1.2 Simplicity	
1.3 Clarity	
1.4 Brevity	
1.5 Courteous	
1.6 Persuasive	
1.7 Sincerity	
1.8 Tactful approach	

2.0 BUSINESS LETTERS

4

2.1 Introduction

2.2 Different types of Business Letters

- Letters of Enquiry
- Letters of Placing Orders
- Letters of Complaints
- Letters in response Letters of Enquiry, Placing Orders and Complaints
- Letters in response to Tender Notices

(samples of effective letters referred to above are to be shown to students)

3.0 JOB APPLICATION LETTERS

3

3.1 Introduction

3.2 Job Application Letters in response to advertisements

3.3 Self-application letters for Jobs

3.4 Covering Letters

4.0 MEETING – AGENDA AND MINUTES

2

4.1 Introduction

4.2 Technique

4.3 Key Language

5.0 MEMOS

3

5.1 Introduction

5.2 Essential features

5.3 Format and Body

6.0 E-MAILS

3

6.1 Introduction

6.2 Method

6.3 Use of attachments

6.4 Netiquettes related to e-mails

(Differences between Memos, Business Letters and E-mails to be explained to students)

7.0 TECHNICAL REPORT WRITING 5

- 7.1 Introduction
- 7.2 Techniques of writing a report
- 7.3 Structure of technical reports
- 7.4 Language of technical reports
- 7.5 Types of Reports
 - Accident Reports (related to industry)
 - Laboratory Experiment Reports
 - Workshop Reports
 - Report of a Job done requiring technical expertise
 - Investigative Report

8.0 JOB INTERVIEWS 4

- 8.1 Importance
- 8.2 Prepare for an interview
- 8.3 Anticipating possible questions & framing appropriate answers to them
- 8.4 Responding politely and appropriately
- 8.5 Non-verbal communication – body language, postures, gestures, facial expressions, use of space, modulation, pitch, intonation etc.

9.0 GROUP DISCUSSIONS 4

- 9.1 Importance and rationale
- 9.2 Required non-verbal behavior
- 9.3 Appropriate use of language in group interaction
 - Entry / Taking the lead
 - Asking for opinion / Creating turns for others to speak
 - Expressing opinion (agreeing)
 - Expressing opinion (disagreeing)
 - Making suggestions
 - Politely interrupting
 - Stopping or blocking interruptions

(Note: Chapters 8 and 9 are to be dealt in the practical classes)

SUGGESTED LEARNING RESOURCES:

Reference Books :

1. English for Specific Purposes: A learning – Centred approach
— Hutchinson, Tom and Waters, Alan, CUP 1987
2. The Second Language Curriculum
— Ed. Robert Keith Johnson, CUP 1989
3. Designing Tasks for the Communicative Classroom
— David Nunan, CUP 1989
4. Writing English Language Tests
— J. B. Heaton Longman Group, U K Limited 1988
5. Testing for Language Teachers
— Arthur Hughes, CUP 1989
6. Writing Matters
— Kristine Brown & Susan Hood, CUP 1989
7. Communicate 2
— Keith Morrow and Keith Johnson, CUP 1980
8. In at the deep end
— Vicki & Hollett, OUP 1989
9. Teaching the Spoken Language,
— G. Brown and G. Yule CUP 1983
10. Teaching Reading Skills in a Foreign Language
— Christine Nuttall, Heinemann 1982
11. Communication in English for Technical Students
Orient Longman 1984
12. Teachers Manual (for Communication in English for Technical Students,
Orient Longman 1984)

PRACTICALS (under G101 and G102):

Suggested activities:

- Students may be encouraged to look up books and websites to get an idea about frequently asked questions and finding out appropriate answers to these questions
- Mock group discussions are to be conducted for students in the presence of teachers and industry experts and these discussions are to be evaluated by peers, teachers and experts
- Organising and participating in Mock interviews by peers, teachers and also experts from the industry

MATHEMATICS-II

L T P
4 1 0

Curri. Ref. No.: G104

Total Contact Hrs.: **Total Marks: 100**

Lecture: 60

Theory:

End Exam : 70

Tutorial: 15

P.A.: 30

Practical: 0

Pre-requisite: G103

Credit : 5

RATIONALE

The purpose of teaching Engineering Mathematics-II to diploma students is to enable them to understand advance uses of mathematics and solving engineering problems. Continuity and sequence is necessary for logical Development of subject. The topic includes Coordinate Geometry, Differential Calculus, Integral Calculus and Vector Algebra. This course will be helpful for the learners those who like to go for higher studies.

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 ALGEBRA	10L+3T
1.1 Co-ordinate Systems:	
1.2 Cartesian & Polar Coordinates	
1.3 Distance between two points.	
1.4 Division of line segment.	
1.5 Area of a triangle.	
1.6 Locus of a point	
1.7 Standard forms of the equations of a straight line:	
1.8 Intersection of straight lines	
1.9 Angle between them	

- 1.10 Bisector of the angle between them.
- 1.11 Change of axes
- 1.12 Transformation of coordinates when origin is shifted and when axes are rotated.
- 1.13 Pair of Straight lines: $x^2 + 2hxy + by^2 = 0$
- 1.14 Geometric figures
 - Circle
 - Parabola
 - Ellipse
 - Hyperbola
- 1.15 Definition & Properties of Geometric figures
- 1.16 Standard Equations of Geometric figures

2.0 DIFFERENTIAL CALCULUS

12L+5T

- 2.1 Functions
 - Independent & Dependent Variables.
 - Types of functions
- 2.2 Limits:
 - Concept of limits.
 - Evaluation of limits.
- 2.3 Differentiation by 1st Principle:
 - Differentiation of Sum, Product and Quotient of functions
 - Differentiation of a function of a function
 - Differentiation of Trigonometric, Inverse Trigonometric & Hyperbolic functions
 - Logarithmic differentiation.
 - Differentiation of Parametric functions.
- 2.4 Partial Differentiation:
 - Partial Differentiation
 - Successive Differentiation
 - Higher order derivatives - up to nth order
 - Linear differential Equation.
- 2.5 Application of differentiation:
 - Differential coefficient.
 - Application of coefficient.
 - Equation for Tangent, Normal δ , Sub-tangent & Subnormal δ

3.0 INTEGRAL CALCULUS

13L+5T

- 3.1 Indefinite Integration: Definition
- 3.2 Methods of Integration:
- Integration by Substitution.
 - Integration by parts
 - Integration by partial fractions.
 - Reduction formulae for integration of $\sin^n x \cdot \cos^n x$
- 3.3 Definite Integrals:
- Definite integral as limit of a sum.
 - Fundamental properties
 - Definition of gamma function.
 - Evaluation of gamma function.
- 3.4 Application of Integration:
- Area of a plane curve.
 - Length of plane curves.
 - Work done.
 - Volume
 - Mean & RMS values.
 - Centre of gravity
 - Simpson's One- Third Rule
- 3.5 Evaluation of Multiple Integrals:
- Evaluation of double integrals.
 - Evaluation of triple integrals.
 - Use of constant limits.

4.0 VECTOR ALGEBRA

10L+2T

- 4.1 Vector and Scalar quantities.
- 4.2 Type of vectors, geometric representation of vector,
- 4.3 Addition and subtraction of vectors, unit vectors i, j and k ,
- 4.4 Magnitude and direction of vectors,
- 4.5 Product of a vector by a scalar, product of two vectors (scalar & vector)
- 4.6 Applications of vectors to engineering problems

SUGGESTED LEARNING RESOURCES

Text Books:

1. Differential Calculus By B.C. Das & B.N. Mukherjee
2. Integral Calculus By B.C. Das & B.N. Mukherjee
3. Elementary Co-ordinate Geometry and Solid figures By B. Das

Reference Books:

1. Engineering Mathematics Part II By Shanti Narayan
2. Engineering Mathematics Vol I & II By Vishwanath
3. Polytechnic Mathematics Vol.II By Dutta & Bera

PHYSICS - II

Curri. Ref. No.: G107

L T P
2 0 2

Total Contact Hrs.: **Total Marks: 150**

Lecture: 30

Tutorial: 0

Practical: 30

Pre-requisite: G106

Credit : 3

Theory:

End Exam : 70

P.A.: 30

Practical:

End Exam.: 25

P.A. : 25

RATIONALE

Physics form a foundation for all technician courses. The study of engineering concepts of physics will help the students in understanding engineering subjects where the emphasis will be on the application of these concepts. A good foundation in physics will also help students for self-development in future, to cope up with the continuous flow of new innovation and discoveries in technology. The topics in Applied Physics for the foundation course were identified on the following basis:

- To develop fundamentals knowledge and skills related to Light, Magnetism, Electricity, Modern Physics and their appropriate applications in engineering.
- Reference to engineering subjects
- Continuity of sequence necessary for logical development of the subjects.

DETAILED COURSE CONTENTS

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
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1.0 LIGHT

8

1.1 Reflection of light

1.1.1 Reflection of light on plane surface (Review):

- Laws of reflection
- Image formation for reflection in a plane mirror.

- Geometrical method of locating image.

1.1.2 Reflection of light on spherical surface :

- Different types of spherical mirror
- Radius of curvature and focus of a spherical mirror.
- Reflection by a spherical mirror: real and virtual images, magnification
- Geometrical method of determination of image position, size and nature of the images formed
- Relation between focal length and radius of curvature of the spherical mirror,
- Relation between object distance, image distance and focal length (no deduction).
- Uses of different types of mirrors.

1.2 Refraction of light:

1.2.1 Refraction of light through plane surface (Review)

- Laws of refraction
- Refractive index in terms of velocity of light in different media
- Total internal reflection and critical angle, concept of fibre optics & its various practical applications
- Dispersion of light through a prism.

1.2.2 Optical Lens:

- Different types of lenses
- Position and nature of images formed by convex and concave lenses ,
- Image formation formula (no deduction)
- Power of a lens
- Electromagnetic spectrum : Infrared, Ultra violet & visible light
- Simple problems

2.0	MAGNETISM	3
2.1	Magnetic properties (Review)	
	<ul style="list-style-type: none"> • Natural and artificial magnets • Properties of magnets • Types of magnets – bar, horse-shoe, needle • Preparation of temporary and permanent magnets • Induced magnetism 	
2.2	Magnetic measurement:	
	<ul style="list-style-type: none"> • Uniform and non-uniform field • Magnetic moment • Inverse square law • Magnetic lines of force • Elements of Earth magnetism : dip, declination and horizontal component 	
3.0	ELECTROSTATICS	3
3.1	Electrostatics Basic:	
	<ul style="list-style-type: none"> • Basic concept of Electric charge • Its production and nature – electrification by rubbing : Kinds of electrification • Electrostatic induction and conduction • Conductors and non-conductors • Surface density of charge, The lightning conductor • Coulomb’s law between electric charges • Field intensity and electric potential • Electric permittivity • Lines of force in electrostatic field 	
4.0	CURRENT ELECTRICITY	10
4.1	Electric current:	
	<ul style="list-style-type: none"> • Cell: Primary & Secondary • Flow of charge – electric current and its unit • Electric motive force (EMF) • Ohm’s law • Resistance and its unit, specific resistance • Resistance in series and parallel 	

	<ul style="list-style-type: none"> • Factors affecting resistance • Wheatstone bridge circuit • Relation for balanced Wheatstone bridge (No deduction) • Meter bridge, P.O. Box • Simple problems 	
4.2	Heating Effects of Current:	
	<ul style="list-style-type: none"> • Joule’s law • Electrical work, energy and power with units • Simple problems. 	
4.3	Magnetic Effect of Electric Current:	
	<ul style="list-style-type: none"> • Magnetic effect of electric current, Bio-Savart law • Fleming’s left hand rule • Application of Magnetic effect of electric current – Galvanometer (concept only) • Electromagnetic Induction: Faraday’s law, Fleming right hand rule, Basic concept of A.C. generator. 	
5.0	MODERN PHYSICS	6
5.1	Photo-electric effect:	
	<ul style="list-style-type: none"> • Photo-electron, Work function, photo electric effect • Photo cell • Einstein photo electric equation • Stopping potential, Threshold Frequency • Principle of solar photo-voltaic cell and its uses. 	
5.2	Semiconductor:	
	<ul style="list-style-type: none"> • Energy band in solids (Idea) • Distinction between conductor, insulators & semi-conductors in terms of energy band diagram, • Intrinsic and extrinsic (P-type; N-type) semiconductor, • P – N junction diode, depletion region, potential barrier. • Forward and reverse biasing; Forward and reverse bias characteristic curve. • Application of P – N junction diode 	
(Note: 10L Hrs. can be used for assessment and evaluation of students on each module.)		

PRACTICAL:

Suggested list of experiments:

1. To determine refractive index of the material of glass slab by pin method.
2. To determine the focal length of a concave mirror by u , v method
3. To determine the focal length of the convex lens by u , v method
4. To plot magnetic lines of force of a bar magnet with North Pole pointing north and to locate the neutral points & measure the magnetic length
5. To plot magnetic lines of force of a bar magnet with South Pole pointing north and to locate the neutral points & measure the magnetic length.
6. To verify Ohm's law by ammeter and Voltmeter method with —
 - (a) Series connection of resistances;
 - (b) Parallel connection of resistances.
7. To measure the unknown resistance / resistivity of the material of a wire by meter Bridge
8. To measure the unknown resistance of the material of a wire by P. O. box.

SUGGESTED LEARNING RESOURCES:

Reference Books:

1. Principle of Physics – Subrahmanyam & Brizal
2. Intermediate Physics – S.C.Roy Chaudhury & D.B.Sinha
3. Fundamentals of Physics – David Halliday, Robert Resnick & Jeal Walka
4. University Physics – Francis W. Sears, Mark W. Zemans Key & Hugh D. Young
5. University Physics – Hugh D. Young & Roger H. Freedman
6. A text book of Physics (Part II) – C. R. Dasgupta
7. Elements of Higher Secondary Physics (Part II) - D. Dutta, B. Pal & B. Chaudhuri
8. Physics (Volume II) - Ajoy Chakraborty
9. Applied Physics (Vol. II) - Saxena H.C. & Singh Prabhakar
10. Physics for 10+2 students (Part II) - Das, S.K, Sisodia M.L, Neher P.K., Kachhawa C.M.

CHEMISTRY – II

L	T	P
2	0	2

Total Contact Hrs.:

Lecture: 30

Tutorial: 0

Practical: 30

Pre-requisite:G

Credit : 3

Total Marks: 150

Curri. Ref. No.: G109

Theory:

End Exam : 70

P.A.: 30

Practical:

108End Exam.: 25

P.A. : 25

RATIONALE:

Chemistry is an important subject in technician education, because of the fact that fundamental knowledge and skills in respect of chemical characteristics of matters related to solid, liquid and gas are essential elements on which various aspects of application in technology depend upon.

Chemistry-II will enable the students to develop fundamental knowledge and skills related to chemical properties of matters in general, such as solid liquid and gas, and their appropriate applications in technical disciplines which include electro-chemistry, fuel, lubricants, corrosion, protective coatings, plastic and polymer, metallurgy and alloys.

DETAILED COURSE CONTENTS

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 ELECTROCHEMISTRY	4
1.1 Define conductor, insulator, semi-conductor, electrolyte and non-electrolyte with examples.	
1.2 State postulates of Arrhenou's and electrolytic theory of dissociation	
1.3 Demonstrate the phenomenon of electrolysis.	
1.4 State and explain Faraday's 1 st and 2 nd laws of electrolysis	
1.5 Define and explain conductance, specific conductance, and molar Conductance, electrochemical cell.	

- Solve problems on electrolysis
- Solve problems, Assignment and Class test.

2.0 FUEL **10**

- 2.1 Explain importance of fuels in industries.
- 2.2 Define 'fuel' and 'combustion of fuel' with examples.
- 2.3 State the classification of fuels into two different ways, namely
 - 2.3.1 Classification based upon occurrence with examples.
 - 2.3.2 Classification based upon state of aggregation with examples.
- 2.4 Define calorific value and mention its units.
- 2.5 Distinguish between gross (or higher) and net (or lower) calorific value.
- 2.6 State the relative merits and demerits of solid, liquid and gaseous fuel
- 2.7 State the availability of different fuels in India.
- 2.8 Define coal.
- 2.9 State and explain origin of coal.
- 2.10 Classify coal by rank.
- 2.11 Define pulverized coal
- 2.12 State the advantage and disadvantage of pulverized coal.
- 2.13 Explain proximate and ultimate analysis of coal.
- 2.14 Define 'Petroleum' or 'Crude oil'
- 2.15 Describe the fractional distillation of crude petroleum
- 2.16 Name the main products obtained from crude petroleum and mention their respective boiling ranges and uses.
- 2.17 State and explain important properties of liquid fuels namely, viscosity, flash and fire point, smoke point, aniline point, knocking, octane number, cetane number, anti-knocking properties.
- 2.18 State composition, preparation and industrial application of coal gas, water gas, producer gas, LPG, natural gas and gobar gas.

Solve problems, Assignments and class tests

3.0 LUBRICANTS **2**

- 3.1 Define 'lubricant' and 'lubrication'.
- 3.2 Mention the major functions of a lubricant.
- 3.3 Different types of lubricants with examples
- 3.4 Applications.

Solve problems, Assignments and class tests

4.0 CORROSION **2**

- 4.1 Define corrosion.
- 4.2 Describe the causes of corrosion.
- 4.3 State the different types of corrosion of metal.
- 4.4 Explain chemical corrosion of metals and mention the names of the corrosion products.
- 4.5 Explain rusting of iron
- 4.6 Name the various methods of corrosion control.

Solve problems, Assignments and class tests

5.0 PROTECTIVE COATING **2**

- 5.1 State the necessity of protective coating.
- 5.2 State the main types of protective coatings.
- 5.3 Recall the different kinds of organic and inorganic (or metallic) protective coating.
- 5.4 Explain the term "Paint".
- 5.5 State the functions of component-drying oil, pigment, driers and thinners with examples.
- 5.6 Varnish, types and application.

Solve problems, Assignments and class tests

6.0 ORGANIC CHEMISTRY **6**

- 6.1 Organic chemistry and its scope in various industries.
- 6.2 Tetravalency of Carbon atom
- 6.3 Functional groups
- 6.4 Distinguish between organic and inorganic compounds.
- 6.5 Homologous series-alkane, alkene, alkyne, alcohol, aldehyde, ketone, ether, carboxylic acid.(general formula)
- 6.6 Preparation method of Methane, ethane Ethene and ethylene
- 6.7 Benzene and its preparation and discuss its derivatives.

7.0 POLYMER AND PLASTICS

4

- 7.1 Define polymer.
- 7.2 The types of polymerization.
- 7.3 Classify polymers
- 7.4 Properties of thermoplastics and thermosetting polymers.
- 7.5 Define plastics
- 7.6 Name important plastic materials with their properties and uses (in tabular form).

Namely : Polythene, Polypropylene, polystyrene, PVC, Nylon, Terelene, Neoprene, Bakelite, Urea-formaldehyde and PET.

- 7.7 Mention examples of plastics used in different situations:

- i) Electrical insulation
- ii) Lubrication
- iii) Ropes and beams
- iv) Optical lens
- v) Adhesives
- vi) Pipes and housing
- vii) Fibre glass
- viii) Carrybag

Solve problems, Assignments and class tests

8.0

PRACTICAL:

Suggested list of experiments:

1. To determine calorific value of solid fuel using Bomb Colorimeter.
2. To find the proximate analysis (% moisture, %Ash, %volatile matter) of a given sample of coal
3. To determine the viscosity of petroleum oil by using Red-wood Viscometer
4. To determine smoke point of petroleum(Kerosene) products by using Smoke meter

5. To determine flash point of petroleum products (Petrol)by using Pensky Martein instrument
6. To determine the aniline point of petroleum products by using Aniline point Instrument
7. To determine the conductivity & TDS of water by Conductivity meter.

SUGGESTED LEARNING RESOURCES:

Text Books:

1. Modern Intermediate Chemistry Part I and Part II
2. By R.N. Nanda, A.K. Das , Y.R Sharma
3. Engineering Chemistry by Jain & Jain
4. A Text Book of Polytechnic Chemistry by J.P. Mehta & Jain and Jain
5. Industrial Chemistry by B.K. Sarma

Reference Books

1. Intermediate Chemistry by R.K. Samal

Suggested List of Equipment :

1. Pensky- Martein instrument
2. Red-wood Viscometer
3. Smoke meter
4. Bomb Calorimeter
5. Conductivity-TDS meter
6. Aniline point meter
7. Muffle Furnace
8. Hot air oven
9. Electronics balance
10. Different sieve trays
11. Glassware, Porcelain ware, and reagent

ENGINEERING DRAWING – II

L T P
1 0 3

Curri. Ref. No.: G202

Total Contact Hrs.: Total Marks: 100

Lecture: 15
Tutorial: 0
Practical: 45
Credit : 3

Theory:
End Exam : 50

Practical:
End Exam.: 25
P.A. : 25

RATIONALE

Engineering Drawing is the precise means of communicating the ideas of the engineer, designer, and architect to the workmen who will produce/build the desired object. It is necessary that all diploma engineers have command over making and reading of engineering drawing and have thorough understanding of geometric principles of orthographic projection upon which engineering drawing is based.

DETAIL COURSE CONTENTS:

THEORY/PRACTICAL:

UNIT	TOPIC/SUB-TOPIC	Hrs.	Total hrs.
1.0	ORTHOGRAPHIC PROJECTIONS	2+6	8
	1.1 Introduction		
	1.2 First angle and Third angle projections		
	1.3 Conversion of simple pictorial view to orthographic view		
	1.4 Draw plan side view and top view in third angle		

2.0	SECTIONAL VIEWS	2+6	8
	2.1 Conversion of given pictorial view to sectional view		
	2.2 Draw sectional view at given sections for both X and Y-axis		
3.0	DEVELOPMENT OF SURFACES	3+6	9
	3.1 Development of surfaces for the following: Cube, Cylinder, Prism, Cone and frustum cone		
4.0	ISOMETRIC PROJECTIONS	3+6	9
	4.1 Isometric Scales		
	4.2 Isometric views of simple objects		
	4.3 Isometric views for slots and cuts in the objects		
5.0	STANDARD CONVENTIONS AND SYMBOLS	1+3	4
	5.1 Conventions as per IS Codes		
	5.2 Symbols as per Codes		
	5.3 The above conventions and symbols are for Civil, Mechanical and Electrical Engineering		
6.0	APPLICATION OF CAD (COMPUTER AIDED DRAFTING)	4+15	19
	6.1 Arc & curve		
	6.2 Sectional view of simple objects		
	6.3 Isometric projections of simple objects		
	6.4 Practicing examples on simple building plans and machine elements		
7.0	FORMATIVE EVALUATION		3
	TOTAL:	15+42	60
		+3	

SUGGESTED LEARNING RESOURCES

Reference Books and Standards:

1. SP 46: Engineering Drawing Practice for School & Colleges – *Published by Bureau of Indian Standard*
2. Elementary Engineering Drawing - N.D. Bhatt. *Charotar Publisher, Anand*
3. Engineering Drawing - Shah/Rana. *published by Pearson*
4. Engineering Drawing – Agarwal & Agarwal. *TMH.*
5. Engineering Drawing – Gujral and Shinde. *Khanna Publisher, N.Delhi.*
6. Engineering Drawing – R.B.Gupta. *Satya Prakashan, Delhi.*
7. Engineering Drawing: With an Introduction to CAD – *D.Jolhe. TMH.*
8. Computer Aided Drawing – Annaih & Patil. *Newage International.*
9. Engineering Graphics with AutoCAD 2013 – Bethune James D. *PHI Learning.*
10. AutoCAD in Easy steps – Whelan. *Wiley Eastern.*
11. AutoCAD 2010 in simple steps – Kogent. *Wiley Eastern.*

WORKSHOP PRACTICE – II

L T P

1 0 3

Total Contact Hrs.:

Lecture: 15

Tutorial: 0

Practical: 45

Pre-requisite: G203

Credit : 3

Curri. Ref. No.: G204

Practical:

End Exam : 50

P.A. : 50

Total Marks: 150

RATIONALE

Diploma holders are responsible for supervising production processes to achieve production targets and for optimal utilization of resources. For this purpose, knowledge about various machining processes, modern machining methods, processing of plastic, tools, jigs and fixtures and processing of plastics is required to be imparted. Hence, the subject of workshop technology.

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 CUTTING TOOLS AND CUTTING MATERIALS	2
1.1. Cutting Tools - Various types of single point cutting tools and their uses, Single point cutting tool geometry, tool signature and its effect, Heat produced during cutting and its effect, Cutting speed, feed and depth of cut and their effect.	
1.2 Cutting Tool Materials - Properties of cutting tool material, Study of various cutting tool materials viz. High-speed steel, tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond.	

2.0	LATHE	3			
2.1	Principle of turning				
2.2	Description and function of various parts of a lathe				
2.3	Classification and specification of various types of lathe				
2.4	Drives and transmission				
2.5	Work holding devices				
2.6	Lathe tools: Parameters/Nomenclature and applications				
2.7	Lathe operations :- Plain and step turning, facing, parting off, taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning.				
2.8	Cutting parameters – Speed, feed and depth of cut for various materials and for various operations, machining time.				
2.9	Speed ratio, preferred numbers of speed selection.				
2.10	Lathe accessories:- Centers, dogs, different types of chucks, collets, face plate, angle plate, mandrel, steady rest, follower rest, taper turning attachment, tool post grinder, milling attachment, Quick change device for tools.				
2.11	Brief description of capstan and turret lathe, comparison of capstan/Turret lathe, work holding and tool guiding devices in capstan and turret lathe.				
3.0	DRILLING	2			
3.1	Principle of drilling.				
3.2	Classification of drilling machines and their description.				
3.3	Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping.				
3.4	Speeds and feeds during drilling, impact of these parameters on drilling, machining time.				
3.5	Types of drills and their features, nomenclature of a drill				
3.6	Drill holding devices.				
3.7	Types of reamers.				
4.0	BORING	2			
4.1	Principle of boring				
4.2	Classification of boring machines and their brief description.				
4.3	Specification of boring machines.				
4.4	Boring tools, boring bars and boring heads.				
4.5	Description of jig boring machine.				
5.0	SHAPING, PLANING AND SLOTING	2			
5.1	Working principle of shaper, planer and slotter.				
5.2	Type of shapers				
5.3	Type of planers				
5.4	Quick return mechanism applied to shaper, slotter and planer machine.				
5.5	Work holding devices used on shaper, planer and slotter.				
5.6	Types of tools used and their geometry.				
5.7	Specification of shaper, planer and slotting machine.				
5.8	Speeds and feeds in above processes.				
6.0	BROACHING	1			
6.1	Introduction				
6.2	Types of broaching machines – Single ram and duplex ram horizontal type, vertical type pull up, pull down, push down.				
6.3	Elements of broach tool, broach tooth details – nomenclature, types, and tool material.				
7.0	JIGS AND FIXTURES	2			
7.1	Importance and use of jigs and fixture				
7.2	Principle of location				
7.3	Locating devices				
7.4	Clamping devices				
7.5	Types of Jigs – Drilling jigs, bushes, template jigs, plate jig, channel jig, leaf jig.				
7.6	Fixture for milling, turning, welding, grinding.				
7.7	Advantages of jigs and fixtures				
8.0	CUTTING FLUIDS AND LUBRICANTS	1			
8.1	Function of cutting fluid				
8.2	Types of cutting fluids				
8.3	Difference between cutting fluid and lubricant				
8.4	Selection of cutting fluids for different materials and operations.				
8.5	Common methods of lubrication of machine tools.				

PRACTICAL

45

SUGGESTED LIST OF EXERCISE/JOBS:

Turning Shop

- Job 1. Grinding of single point turning tool.
- Job 2. Exercise of simple turning and step turning.
- Job 3. A composite job involving, turning, taper turning, external thread cutting and knurling.

Advanced Fitting Shop

- Job 1. Exercise on drilling, reaming, counter boring, counter sinking and tapping
- Job 2. Dove tail fitting in mild steel
- Job 3. Radius fitting in mild steel
- Job 4. Pipe threading with die

Machine Shop

- Job 1. Prepare a V-Block up to ± 0.5 mm accuracy on shaper machine
- Job 2. Exercise on key way cutting and spline cutting on shaper machine.

SUGGESTED LEARNING RESOURCES:

Reference Books :

1. B.S. Raghuvanshi *Workshop Technology* Dhanpat Rai and Sons; Delhi
2. M. Adithan and A.B. Gupta *Manufacturing Technology* New Age International (P) Ltd, Delhi.
3. SK Choudhry and Hajra *Elements of Workshop Technology* Asia Publishing House
4. PC Sharma *A Text Book of Production Engineering* S Chand and Company Ltd. Delhi

ENGINEERING MECHANICS

L T P
3 0 0

Curri. Ref. No.: G206

Total Contact Hrs.: Total Marks: 150

Lecture: 45

Tutorial: 0

Practical:0

Credit : 3

Theory:

End Exam : 70

P.A. : 30

RATIONALE

Engineering Mechanics in Diploma Programme is intended to expose the students to the Principles of Mechanics including Static, Kinematics and Dynamics. The knowledge of this subject will be use full in higher level of courses like Strength of Material, Theory of structure, Theory of Machines and Machine design etc.

The selected topics aimed to develop in the students the ability to analyze system of forces and motion met within the field of Engineering.

DETAIL COURSE CONTENT

THEORY

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
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1.0 INTRODUCTION

3

- 1.1 Definition of Statics, Mechanics, Kinetics, Kinematics, Dynamics
- 1.2 Units of Measurement
- 1.3 Units Conversion
- 1.4 Scalar and vector quantity

2.0	COMPOSITION & RESOLUTION OF FORCES	11			
2.1	Definition of force				
2.2	Measurement and effect of force				
2.3	Composition of forces				
2.4	Methods of finding resultant of forces – Analytical and Graphical methods				
2.5	Classification for forces				
2.6	Law of Parallelogram of forces, Concepts & equilibrium of forces in two dimension, Free body concept and diagram, Lami's theorem, equation of equilibrium				
3.0	CENTRE OF GRAVITY AND CENTROID & MOMENT OF INERTIA	8			
3.1	Difference between Centre of Gravity (C.G) and Centroid				
3.2	Methods of finding-out C.G. of simple geometrical plane figures				
3.3	C.G. of standard solids: rod, rectangular prism, circular disk, circular cylinder, hollow cylinder, circular cone, solid sphere, hollow sphere and composite solid.				
3.4	Centroid of standard shapes: rectangle, parallelogram, triangle, circle, quarter circle, semi circle, sector of a circle and composite area				
3.5	Standard Sections: I-Section, C-Section, H-Section, T-Section, L-Section				
3.6	Theorem of moment				
3.7	Simple numerical problems on determination of C.G. & Centroid				
3.8	Concept of moment of inertia and second moment of area				
3.9	Radius of gyration				
3.10	Theorem of perpendicular axis and parallel axis (without derivation)				
3.11	Second moment of area of common geometrical sections :Rectangle, Triangle, Circle (without derivation); Second moment of area for L,T and I section				
4.0	FRICITION AND ITS APPLICATIONS	4			
4.1	Definition and Concept of Friction				
4.2	Law of Friction, Co-efficient of friction, angle of friction, angle of repose				
4.3	Types of friction				
4.4	Screw Jacks – Friction, Relation between effort & load Simple numerical problems				
5.0	MOTION AND ITS APPLICATIONS	3			
5.1	Newton's law of Motion – Applications				
5.2	Angular displacement, Angular Velocity, Angular Acceleration, Relative Velocity				
5.3	Simple Engineering Problems				
6.0	MOTION OF PROJECTILE	3			
6.1	Definition of Trajectory				
6.2	Velocity of Projection, Angle of Projection				
6.3	Time of flight and range				
6.4	Derivation of the equation of motion of a Projectile and its application				
7.0	CURVILINEAR MOTION AND CENTRIPETAL FORCE	5			
7.1	Definition of Centripetal and Centrifugal forces				
7.2	Importance of Super-elevation Expression				
7.3	Simple Engineering Problem.				
8.0	WORK, POWER AND ENERGY	5			
8.1	Work done in rotation				
8.2	Force displacement diagram				
8.3	Work done in machines used for lifting				
8.4	Definition of Power				
8.5	Power of Engines & Pumps				
8.6	Fly Wheels – Changes in speed and in Kinetic Energy				
8.7	Simple Engineering Problems on work, Power and Energy.				
9.0	SIMPLE MACHINES	3			
9.1	Definition of effort, Mechanical Advantage (MA) Velocity Ratio (V.R) efficiency of machine, Law of Machines				
9.2	Screw Jack, Wheel & Axle, Rope & Pulley				
9.3	Simple Calculations				

SUGGESTED LEARNING RESOURCES:

Reference Books :

1. *A Text Book Engineering Mechanics*-R. K. Bansal, Laxmi Publications
2. *A Text book of Engineering Mechanics* -R. S. Khurmi, S.Chand & Co Ltd.
3. *Engineering Mechanics & Strength of Materials*-S. Ramamurtham, Dhanpat Rai. Publishing Co(P) Ltd.
4. *Engineering Mechanics*-Basudeb Bhattacharyya.Oxford University Press
5. *Fundamentals of Engineering Mechanics*-Ali Hassan and R. A. Khan. Acme Learning Pvt. Ltd.
6. *Engineering Mechanics*-J. L. Meriam and L. G. Kraige. Dynamics, John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
7. *Engineering Mechanics*-I. H. Shames. Prentice-Hall of India Pvt. Ltd., New Delhi, 1995

DEVELOPMENT OF LIFE SKILL - I

L T P
1 0 2

Total Contact Hrs.: **Total Marks: 50**

Lecture: 15

Tutorial: 0

Practical:30

Credit : 2

Curri. Ref. No.: G301

Practical:

End Exam.:

P.A. : 50

Aim :-This subject is kept to

- Conduct different session to improve students memory Power
- Conduct different session to improve time management skills
- Motivate student to face realistic problem with confidence and positive approach

Objective: - This course will enable the students to:

- Develop reading skills
- Use techniques of acquisition of information from various sources
- Draw the notes from the text for better learning.
- Apply the techniques of enhancing the memory power.
- Develop assertive skills.
- Prepare report on industrial visit.
- Apply techniques of effective time management.
- Set the goal for personal development.
- Enhance creativity skills.
- Develop good habits to overcome stress.
- Face problems with confidence

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
------------------------	--------------

Unit -1 **Importance of DLS**

Introduction to subject, importance in present context, application

01

Unit -2 Information Search

Information source –Primary, secondary, tertiary Print and non – print, documentary, Electronic Information center, Library, exhibition, Government Departments. Internet Information search – Process of searching, collection of data –questionnaire, taking Interview, observation method.

Unit – 3 Written communication

Method of note taking
Report writing –Concept, types and format.

Unit – 4 Self Analysis

Understanding self— Attitude, aptitude, assertiveness, self esteem, Confidence buildings. Concept of motivation.

Unit – 5 Self Development

Stress Management –Concept, causes, effects and remedies to Avoid / minimize stress.

Health Management – Importance, dietary guidelines and exercises.
Time management - Importance, Process of time planning, Urgent Vs importance, Factors leading to time loss and ways to handle it.
Tips for effective time management.

Emotion-concept, Types, Controlling, Emotional intelligence,
Creativity - concept, Factors enhancing creativity
Goal setting - concept, Setting smart goal.

Unit – 6 Study habits

Ways to enhance memory and concentration.
Developing reading skills.
Organization of knowledge.
Model and methods of learning.

02

01

02

06

03

SUGGESTED LEARNING RESOURCES

Reference Books:

1. Personality Development & Soft Skills - B. K.Mitra, Oxford University Press
2. Basic Managerial Skills for All - E.H. Mc Grath , S.J., Prentice Hall of India Pvt Ltd
3. Body Language - Allen Pease, Sudha Publications Pvt. Ltd.
4. Creativity and problem solving - Lowe and Phil, Kogan Page (I) P Ltd
5. Decision making & Problem Solving - Adair, J, Orient Longman
6. Develop Your Assertiveness - Bishop , Sue, Kogan Page India
7. Time management - Chakravarty, Ajanta, Rupa and Company
8. Life Skills Activities for Secondary Students with Special Needs - Darlene Mannix, Kindle Edition

Internet Assistance:

- 1) <http://www.mindtools.com>
- 2) <http://www.stress.org>
- 3) <http://www.ethics.com>
- 4) <http://www.coopcomm.org/workbook.htm>
- 5) <http://www.mapfornonprofits.org/>
- 6) <http://www.learningmeditation.com> <http://bbc.co.uk/learning/courses/>
- 7) <http://eqi.org/>
- 8) <http://www.abacon.com/commstudies/interpersonal/indisclosure.html>
- 9) <http://www.mapnp.org/library/ethics/ethxgde.htm>
- 10) http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
- 11) <http://members.aol.com/nonverbal2/diction1.htm>
- 12) http://www.thomasarmstron.com/multiple_intelligences.htm
- 13) <http://snow.utoronto.ca/Learn2/modules.html>
- 14) <http://www.quickmba.com/strategy/swot/>

PRACTICAL:

Suggested List of Activities:

- 1 Conduct Guest Lectures.
- Conduct Industrial visits.
- Conduct Seminar/Group Discussions.

Suggested List of Assignments/Tutorial :

The Term Work Will Consist Of Following Assignments.

- 1 Library search:-
Visit your Institute's Library and enlists the books available on the topic given by your teacher. Prepare a bibliography consisting name of the author, title of the book, publication and place of publication.
- 2 Enlist the magazines, periodicals and journals being available in your library. Select any one of them and write down its content. **Choose a topic for presentation.**
- 3 Attend a seminar or a guest lecture, listen it carefully and note down the important points and prepare a report of the same.
- 4 Visit to any one place like historical/office/farms/development sites etc. and gather information through observation, print resources and interviewing the people.
- 5 Prepare your individual time table for a week –
 - (a) List down your daily activities.
 - (b) Decide priorities to be given according to the urgency and importance of the activities.
 - (c) Find out your time wasters and mention the corrective measures.
- 6 Keep a diary for your individual indicating- planning of time, daily transactions, collection of good thoughts, important data, etc
- 7 Find out the causes of your stress that leads tension or frustration. Provide the ways to avoid them or to reduce them.
- 8 Undergo the demonstration on yoga and meditation and practice it. Write your own views, feeling and experiences on it.

NOTE: - THESE ARE THE **SUGGESTED ASSIGNMENT** FOR GUIDE LINES TO THE SUBJECT TEACHER. HOWEVER THE SUBJECT TEACHERS CAN SELECT, DESIGN ANY ASSIGNMENT RELEVANT TO THE TOPIC, KEEPING IN MIND THE OBJECTIVES OF THIS SUBJECT.

Professional practices –I

L T P
0 0 2

Curri. Ref. No.:

Total Contact Hrs.:

Total Marks: 50

Practical:

Theory: 15

End Exam.:

Tutorial: 0

P.A. : 50

Practical:30

Credit : 2

Aim :-This subject is kept to deliver knowledge education beyond the baccalaureate degree for the practice

Objective: - On completion of this course, the Student will be able to:

- Search information from different sources for preparing notes on given topic.
- Present given topic in a seminar. Interact with peers to share thoughts.
- Prepare a report on industrial visit, expert lecture.

Suggested List of activities to be done:

1. **Industrial Visits:** **10**
Structured industrial visits (two nos.) be arranged and report of the same should be submitted by the individual student, to form part of the term work.
2. Lectures by Professional / Industrial Expert / Student Seminars **06**
- based on information search to be organized Three nos.)
3. **Group Discussion:** **06**
The students should discuss in a group of six to eight students and write a brief report on the same as a part of term work. Two topics for group discussions may be selected by the faculty members. Some of the suggested topics are -
 - i) Sports
 - ii) Current news items
 - iii) Discipline and House Keeping
 - iv) Current topics related to own engineering field.
4. **Student Activities:** **08**
The students in a group of 3 to 4 will perform **one** activity (Faculty members of the concerned discipline may provide a list of activities)

Sample path for Term II in Civil Engg., Mechanical Engg., Electrical Engg., and Computer Science and Engg.

Sl. No	Code	Course	Study Scheme			Evaluation Scheme								Total Marks	Credit
			Pre-requisite	Contact Hours / Week			Theory			Practical					
				L	T	P	End Exam	Progressive Assessment			End Exam	Progressive Assessment			
								Class Test	Assignment	Attendance		Sessional	Viva voce		
1	G102	Communication Skill-II	G101	2	0	2	70	15	10	5	-	15	10	125	3
2	G104	Mathematics-II	G103	4	1	0	70	15	10	5	-	-	-	100	5
3	G107	Physics - II	G105	2	0	2	70	15	10	5	25	15	10	150	3
4	G109	Chemistry - II	G107	2	0	2	70	15	10	5	25	15	10	150	3
5	G202	Engineering Drawing – II	G201	1	0	4	-	-	-	-	25	25	-	50	3
6	G204	Workshop Practice - II	G203	0	0	4	-	-	-	-	-	25	25	50	2
7	G206	Engineering Mechanics	G105 & G106	3	0	2	70	15	10	5	0	50	-	150	4
8	G301	Development of Life Skill-I		1	0	2	-	0	0	0	-	25	25	50	2
9		Professional Practices - I		0	0	2	-	-	-	-	-	50	-	50	1
TOTAL				15	1	20	350	75	50	25	75	175	50	875	26