STUDY AND EVALUATION SCHEME FOR
DIPLOMA PROGRAMME IN MECHANICAL ENGINEERING
GOVT. POLYTECHNIC COLLEGE, PULWAMA-IUST

FIRST SEMESTER (FOR THE BATCH 2018 & ONWARDS)

COURSE CODE	COURSE NAME	TYPE OF COURSE	STUDY SCHEME Hrs/Week			MARKS IN EVALUATION SCHEME		TOTAL MARKS	CREDITS
			L	T	P	MID TERM*	END TERM		
DIP101	APPLIED MATHEMATICS – I	Core	3	1	0	50	50	100	4
DIP102	APPLIED PHYSICS – I	Core	3	0	0	50	50	100	3
DIP102P	APPLIED PHYSICS – I LAB	Core	0	0	2	-	50	50	1
DIP103	APPLIED CHEMISTRY – I	Core	3	0	0	50	50	100	3
DIP103P	APPLIED CHEMISTRY – I LAB	Core	0	0	2	-	50	50	1
DIP104P	ENGINEERING DRAWING – I	Core	1	0	4	50	50	100	3
DIP105P	GENERAL WORKSHOP PRACTICE – I	Core	0	0	4	50	50	100	2
DIP106	SOFT SKILLS – I	Compulsory Foundation	3	0	0	50	50	100	3
DIP106P	LANGUAGE LAB– I	Compulsory Foundation	0	0	2	-	50	50	1
DIP107P	# STUDENT CENTERED ACTIVITIES	Compulsory Foundation	0	0	2	25	-	25	1
Total			**13**	**1**	**16**	**325**	**450**	**775**	**22**
			30						

L= Lecture, T= Tutorial, P= Practical

* **50 = 30(Test) + 20(Attendance/Assignment)**

\# SCA will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc.

STUDY AND EVALUATION SCHEME FOR
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GOVT. POLYTECHNIC COLLEGE, PULWAMA-IUST

SECOND SEMESTER (FOR THE BATCH 2018 & ONWARDS)

COURSE CODE	COURSE NAME	TYPE OF COURSE	STUDY SCHEME Hrs/Week			MARKS IN EVALUATION SCHEME		TOTAL MARKS	CREDITS
			L	T	P	MID-TERM*	END-TERM		
DIP201	APPLIED MATHEMATICS – II	Core	3	1	0	50	50	100	4
DIP202	APPLIED PHYSICS – II	Core	3	0	0	50	50	100	3
DIP202P	APPLIED PHYSICS – II LAB	Core	0	0	2	-	50	50	1
DIP203	APPLIED CHEMISTRY – II	Core	3	0	0	50	50	100	3
DIP203P	APPLIED CHEMISTRY – II LAB	Core	0	0	2	-	50	50	1
DIP204P	ENGINEERING DRAWING – II	Core	1	0	4	50	50	100	3
DIP205P	GENERAL WORKSHOP PRACTICE – II	Core	0	0	4	50	50	100	2
DIP206	SOFT SKILLS – II	Compulsory Foundation	3	0	0	50	50	100	3
DIP206P	LANGUAGE LAB – II	Compulsory Foundation	0	0	2	-	50	50	1
DIP207	COMPUTER PROGRAMMING AND APPLICATIONS	Compulsory Foundation	2	0	0	50	50	100	2
DIP207P	COMPUTER PROGRAMMING AND APPLICATIONS LAB	Compulsory Foundation	0	0	2		50	50	1
Total			**15**	**1**	**16**	**350**	**550**	**900**	**24**
			32						

L= Lecture, T= Tutorial, P= Practical

*** 50 = 30(Test) + 20(Attendance/Assignment)**

STUDY AND EVALUATION SCHEME FOR
DIPLOMA PROGRAMME IN MECHANICAL ENGINEERING
GOVT. POLYTECHNIC COLLEGE, PULWAMA-IUST

THIRD SEMESTER(FOR THE BATCH 2017 & ONWARDS)

COURSE CODE	COURSE NAME	TYPE OF COURSE	STUDY SCHEME Hrs/Week			MARKS IN EVALUATION SCHEME		TOTAL MARKS	CREDITS
			L	T	P	MID-TERM*	END-TERM		
DME301	THERMODYNAMICS-I	Core	3	0	0	50	50	100	3
DME301P	THERMODYNAMICS-I LAB	Core	0	0	2		50	50	1
DME302	APPLIED MECHANICS	Core	3	0	0	50	50	100	3
DME302P	APPLIED MECHANICS LAB	Core	0	0	2		50	50	1
DME303	WORKSHOP TECHNOLOGY-I	Core	3	0	0	50	50	100	3
DME303P	WORKSHOP TECHNOLOGY-I LAB	Core	0	0	4		50	50	2
DME304	MATERIAL SCIENCE	Core	3	0	0	50	50	100	3
DME304P	MATERIAL SCIENCE LAB	Core	0	0	2		50	50	1
DME305P	MACHINE DRAWING-I	Core	1	0	4	50	50	100	3
DME306P	# STUDENT CENTERED ACTIVITIES	Compulsory Foundation	0	0	2	25		25	1
XXXEXX	ELECTIVE-I	Elective	3	0	0	50	50	100	3
Total			**16**	**0**	**16**	**325**	**500**	**825**	**24**
			32						

L = Lecture, T = Tutorial, P= Practical

* 50 = 30 (Test) + 20 (Attendance/Assignment)

\# SCA will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc.

STUDY AND EVALUATION SCHEME FOR
DIPLOMA PROGRAMME IN MECHANICAL ENGINEERING
GOVT. POLYTECHNIC COLLEGE, PULWAMA-IUST

FOURTH SEMESTER(FOR THE BATCH 2017 & ONWARDS)

COURSE CODE	COURSE NAME	TYPE OF COURSE	STUDY SCHEME Hrs/Week			MARKS IN EVALUATION SCHEME		TOTAL MARKS	CREDITS
			L	T	P	MID-TERM*	END-TERM		
DME401	THERMODYNAMICS-II	Core	3	1	0	50	50	100	4
DME401P	THERMODYNAMICKS-II LAB	Core	0	0	2		50	50	1
DME402	STRENGTH OF MATERIALS	Core	3	1	0	50	50	100	4
DME402P	STRENGTH OF MATERIALS LAB	Core	0	0	2		50	50	1
DME403	WORKSHOP TECHNOLOGY-II	Core	3	0	0	50	50	100	3
DME403P	WORKSHOP TECHNOLOGY-II LAB	Core	0	0	4		50	50	2
DME404	METROLOGY & QUALITY	Core	3	0	0	50	50	100	3
DME404P	METROLOGY & QUALITY CONTROL LAB	Core	0	0	2		50	50	1
DME405P	MACHINE DRAWING –II	Core	1	0	4	50	50	100	3
DME406P	# STUDENT CENTERED ACTIVITIES	Compulsory Foundation	0	0	2	25		25	1
DIPGXX	ELECTIVE II (GENERIC)	Generic Elective	3	0	0	50	50	100	1
Total			**16**	**2**	**16**	**325**	**500**	**825**	**24**
			34						

L = Lecture, T = Tutorial, P= Practical

* 50 = 30 (Test) + 20 (Attendance/Assignment)

\# SCA will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc.

STUDY AND EVALUATION SCHEME FOR
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FIFTH SEMESTER(FOR THE BATCH 2017 & ONWARDS)

COURSE CODE	COURSE NAME	TYPE OF COURSE	STUDY SCHEME Hrs/Week			MARKS IN EVALUATION SCHEME		TOTAL MARKS	CREDITS
			L	T	P	MID-TERM*	END-TERM		
DME501	PRODUCTION MANAGEMENT	CORE	3	0	0	50	50	100	3
DME502	THEORY OF MACHINES	CORE	4	0	0	50	50	100	4
DME503	HYDRAULICS AND HYDRAULIC MACHINES	CORE	3	0	0	50	50	100	3
DME503P	HYDRAULICS AND HYDRAULIC MACHINES LAB	CORE	0	0	2		50	50	1
DME504	MANUFACTURING TECHNOLOGY	CORE	3	0	0	50	50	100	3
DME504P	MANUFACTURING TECHNOLOGY LAB	CORE	0	0	4		50	50	2
DME505P	COMPUTER AIDED DESIGN	CORE	1	0	4	50	50	100	3
DME506P	MINOR PROJECT WORK	CORE	0	0	6	50	50	100	3
DME507P	INDUSTRIAL TRAINING	CORE	0	0	4	50	50	100	2
			14	**0**	**20**	**350**	**450**	**800**	**24**
			34						

L = Lecture, T = Tutorial, P= Practical

* 50 = 30 (Test) + 20 (Attendance/Assignment)

STUDY AND EVALUATION SCHEME FOR
DIPLOMA PROGRAMME IN MECHANICAL ENGINEERING
GOVT. POLYTECHNIC COLLEGE, PULWAMA-IUST

SIXTH SEMESTER(FOR THE BATCH 2017 & ONWARDS)

COURSE CODE	COURSE NAME	TYPE OF COURSE	STUDY SCHEME Hrs/Week			MARKS IN EVALUATION SCHEME		TOTAL MARKS	CREDITS
			L	T	P	MID-TERM*	END-TERM		
DME601	COMPUTER AIDED MANUFACTURING	Core	3	1	0	50	50	100	4
DME601P	COMPUTER AIDED MANUFACTURING LAB	Core	0	0	2		50	50	1
DME602	REFRIGERATION AND AIR CONDITIONING	Core	3	1	0	50	50	100	4
DME602P	REFRIGERATION AND AIR CONDITIONING LAB	Core	0	0	2		50	50	1
DME603	MACHINE DESIGN	Core	3	1	0	50	50	100	4
DME604P	MAJOR PROJECT WORK	Core	0	0	12	50	100	150	6
XXXExx	ELECTIVE III	Elective	3	0	0	50	50	100	3
			12	**3**	**16**	**250**	**400**	**650**	**23**
			31						

L = Lecture, T = Tutorial, P= Practical

* 50 = 30 (Test) + 20 (Attendance/Assignment)

LIST OF ELECTIVES

ELECTIVE-I

COURSE CODE	COURSE NAME	CREDITS
DEEE73	ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING	03
DEEE74	ELECTRICAL MEASURING INSTRUMENTS AND INSTRUMENTATION	03
DEEE75	CONTROL SYSTEMS	03
DCEE71	ENVIRONMENTAL ENGINEERING AND POLLUTION	03
DCEE73	PLUMBING SERVICES	03
DCEE74	MAINTENANCE AND REHABILITATION OF STRUCTURES	03

ELECTIVE-II (GENERIC)

COURSE CODE	COURSE NAME	CREDITS
DIPG71	ENTREPRENEURSHIP DEVELOPMENT.	03
DIPG72	MANAGEMENT PRINCIPLES AND PRACTICES	03
DIPG73	SPOKEN ARABIC	03
DIPG74	OPERATION RESEARCH & OPTIMIZATION	03

ELECTIVE-III

COURSE CODE	COURSE NAME	CREDITS
DMEE73	ALTERNATE ENERGY SOURCES & MANAGEMENT	03
DMEE74	MECHATRONICS	03
DMEE75	AUTOMOBILE ENGINEERING	03
DMEE76	TOOL ENGINEERING	03
DMEE77	POWER PLANT ENGINEERING	03
DMEE78	ADVANCED MANUFACTURING PROCESSES	03
DMEE79	INDUSTRIAL ENGINEERING	03

LIST OF ELECTIVES OFFERED TO SISTER BRANCHES;

COURSE CODE	COURSE NAME	OFFERED TO	CREDITS
DMEE71	APPLIED MECHANICS	CIVIL	03
DMEE72	ENGINEERING THERMODYNAMICS	CIVIL/ELECTRICAL	03
DMEE74	MECHATRONICS	ELECTRICAL	03

DIP101 **APPLIED MATHEMATICS-I** **L3:T1:P0**

RATIONALE

Applied Mathematics forms the backbone of engineering students. This course will develop analytical abilities to make exact calculations and will provide continuing educational base to the students.

DETAILED CONTENTS

UNIT 1

Partial fractions (linear factors, repeated linear factors, non-reducible quadraticfactors excluding repeated factors)Concept of permutations and Combinations: Value of ${}^{n}p_{r}$ ${}^{n}c_{r}$.Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof)

UNIT 2

Review of ratios of some standard angles (0,30,45,60,90 degrees), T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2).

UNIT 3

Complex numbers: Complex numbers, representation, modulus and amplitude,
Demovier's theorem and its applications in solving algebraic equation.
Geometrical progression, its nth term and sum of n terms and to infinity with
application to engineering problems.

UNIT 4

Equation of straight line in various standard forms (without proof), inter section of two straight lines, angle between two lines, perpendicular distance formula (without proof)
General equation of a circle and its characteristics.

UNIT 5

To find the equation of a circle, given:

Centre and radius
Three points lying on it
Coordinates of end points of a diameter

Equations of conics (ellipse, parabola and hyperbola), simple problems related to engineering (standards forms only)

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
3. Applied Mathematics by Dr. R D Sharma
4. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar
5. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
6. Engineering Mathematics by Dass Gupta
7. Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi
8. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
9. Engineering Mathematics, Vol I, II & I
10. Prentice Hall of India Pvt. Ltd.,
11. Engineering Mathematics, Vol I & II by AK Gupta, MacMillan India Ltd., New Delhi.

DIP102 **APPLIED PHYSICS -I** **L3:T0:P0**

RATIONALE

Applied physics includes the study of a large number of diverse topics all related to things that go on in the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which objects will behave. Concrete use of physical principles and analysis in various fields of engineering and technology are given prominence in the course content.

Note: - Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to appreciate learning of these concepts and principles.

DETAILED CONTENTS

UNIT 1

Units and Dimensions

Physical quantities

Units - fundamental and derived units, systems of units (FPS, CGS, MKS and SI units)

Dimensions and dimensional formulae of physical quantities

Dimensional equations and principle of homogeneity, applications to conversion from one system of units to another, checking the correctness of physical relations and derivation of simple physical relations, limitations of dimensional analysis

Error in measurement, random and systematic errors, types of errors, propagation of errors, significant figures

Concept of Scalar and Vector quantities – examples, types of vectors.
Resolution and Composition of vectors, Vector multiplication (scalar product and vector product of vectors), addition of vectors (Parallelogram law)

UNIT 2

Force and Motion

Concept of Scalar and Vector quantities – examples, types of vectors.
Resolution and Composition of vectors, Vector multiplication (scalar product and vector product of vectors), addition of vectors (Parallelogram law)
Force: Newton's laws of motion, linear momentum and conservation of linear momentum, impulse and its application, simple numerical problem in brake system of vehicles and trains etc.
Friction: Types of friction and its application.
Circular motion: Angular displacement, angular velocity and angular acceleration
Relation between linear and angular variables (velocity and acceleration)

Centripetal force (derivation) and centrifugal force with application such as banking of roads andbending of cyclists
Application of various forces in lift
Concept of translatory and rotating motion with examples

Definitions of torque, angular momentum and their relationship

Conservation of angular momentum (qualitative) and its examples

Moment of inertia and its physical significance, radius of gyration, Theorems of parallel and perpendicular axes (statements), Moment of inertia of rod, disc, ring and sphere (Formulae only).

Application of rotational motions in transport vehicles, trains and aero plane turbine/engine.

UNIT 3

Work, Power and Energy

Work: definition and its SI units

Work done in moving an object on horizontal and inclined plane (incorporating frictional forces) with its application

Power: definition and its SI units, calculation of power with numerical problems

Energy: Definition and its SI units: Kinetic energy and Potential energy with examples and their derivation

Principle of conservation of mechanical energy (for freely falling bodies), transformation of energy from one form to another with its application

UNIT 4

Properties of Matter

Elasticity: definition of stress and strain, different types of modulus of elasticity, stress – strain diagram, Hooke's law with its applications

Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications

Surface tension: concept, its units, angle of contact, measurement of surface tension by capillary tube method, applications of surface tension, effect of temperature and impurity on surface tension

Viscosity and coefficient of viscosity: Stoke's Law and derivation of terminal velocity, effect of temperature on viscosity.

Difference between heat and temperature

Principles of measurement of temperature and different scales of temperature and their relationship

Types of thermometers (Concept only)

Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them

Modes of transfer of heat (Conduction, convection and radiation with examples)

Co-efficient of thermal conductivity

Engineering Application of conduction, convection and radiations

UNIT 5

Waves and Vibrations

Simple Harmonic Motion(SHM): definition, expression for displacement, velocity, acceleration, time period, frequency in S.H.M. Equation of simple harmonic progressive wave

Wave motion: transverse and longitudinal wave motion with examples, sound and light waves, velocity, frequency and wave length of a wave (relationship $v = n\lambda$) and their applications

Free, forced and resonant vibrations with examples

Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications

Ultrasonics – production (magnetostriction and piezoelectric methods) and their engineering and medical applications.

RECOMMENDED BOOKS

1. Text Book of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
2. Text Book of Physics for Class XII (Part-I, Part-II) N.C.E.R.T
3. Applied Physics Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, New Delhi
4. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
5. Berkeley Physics Course, Vol. I, II &III, Tata McGraw Hill, Delhi
6. Comprehensive Practical Physics, Vol. I & II, JN Jaiswal, Laxmi Publishers
7. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
8. Applied Physics I & II by RA Banwait & R Dogra, Eagle Parkashan, Jalandhar
9. Applied Physics by Jasmer Kaur and Bhupinder Singh, Lords Publications, Jalandhar
10. Engineering Physics by Vanchna Singh and Sheeetal Kumar, Cengage Learning India

DIP102P **APPLIED PHYSICS-I LAB** **L0:T0:P2**

LIST OF PRACTICALS

1. To find volume of solid cylinder and hollow cylinder using a vernier calipers
2. To determine the thickness of glass strip and radius of curvature using a spherometer
3. To verify parallelogram law of forces
4. To find the time period of a simple pendulum and determine the length of second' pendulum.
5. To find the frequency of a tuning fork by a sonometer
6. To find the velocity of sound by using resonance apparatus at room temperature.
7. To find the Moment of Inertia of a flywheel about its axis of rotation
8. To find the surface tension of a liquid by capillary rise method
9. To determine the atmospheric pressure at a place using Fortin's Barometer
10. To determine the viscosity of glycerin by Stoke's method
11. To determine the coefficient of linear expansion of a metal rod

DIP103 **APPLIED CHEMISTRY-I** **L3:T0:P0**

RATIONALE

Every branch of engineering is expanding greatly. The contributions of chemicals and chemical products are playing important role in the field of engineering, biotechnology, agriculture and pharmacology etc. The numbers of such chemical products are exponentially increasing each successive year. This results in enhancing the responsibility of engineers while choosing engineering materials for converting them into finished products. Now a days, choosing engineering material is not only based on conventional qualitative and quantitative testing of their chemical composition and behavior under service conditions, but also based on environmental and eco-friendly factors. To achieve such objectives it is essential to know applied aspects of chemistry. Applied chemistry for diploma students in various engineering and technology courses is designed to develop scientific temper and appreciation of physical and chemical properties of engineering materials, which are used in their professional career. Best efforts should be made to teach and train the engineers by imparting essential knowledge required from this subject through demonstrations, and minor projects.

Note:- Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to appreciate learning of these concepts and principles.

DETAILED CONTENTS

UNIT 1

Basic Concepts of Chemistry

S.I. Units of pressure, volume, density, specific gravity, surface tension, viscosity and conductivity.

Matter, element, compound and mixtures, atoms, molecules, ions, symbols and formulae, Atomic mass (A), atomic number (Z) isotopes, isobars, isotone (recapitulation only)

Chemical equations, thermo-chemical equations, balancing of chemical equations

UNIT 2

Atomic Structure, Periodic Table and Chemical Bonding

Fundamental particles- electrons, protons and neutrons

Orbit & orbital, electronic configuration of elements (upto Z=30)

Modern periodic law and periodic table, groups and periods.

Chemical bond: Types of bonding- Ionic bond, covalent bond & Coordinate bond.

UNIT 3

Water
Sources of water
Types of water based on dissolved salts.
Hard water, soft water
Units to measure water hardness in ppm (mg/l) & simple numericals, degree Clark & degree French
Disadvantages of use of hard water in domestic and industrial applications (mainly boiler feed water)
Methods to remove water hardness by
Ion exchange process
Lime-soda process
Reverse Osmosis method
Quality criteria of drinking water as per BIS. (with special emphasis on hardness, total dissolved solids (TDS), Chloride, alkalinity present in water)

UNIT 4

Solutions
Concept of homogenous solution, brief introduction of the terms
(i) Ionization (ii) Acidity (iii) Basicity (iv) equivalent weight and gram equivalent weight with suitable examples
Strength of a solution (i) Normality (ii) Molarity (iii) Molality as applied in relation to a sol
Definition of pH, simple numericals and different industrial applications of pH.
Buffer solution and applications of buffer.

UNIT 5

Electrochemistry and Corrosion
Definition of the terms: Electrolytes, Non-electrolytes with suitable examples
Faraday's Laws of Electrolysis and simple numericals.
Applications of redox-reactions in battery technology such as (i) Dry cell (ii) lead acid battery and (iii) Ni-Cd battery
Corrosion: Theories of corrosion i.e. (i) direct chemical action theory and (ii) electro chemical theory
Prevention of Corrosion

RECOMMENDED BOOKS

1. Chemistry in Engineering by J.C. Kuriacose and J. Rajaram; Tata McGraw-Hill

2. Engineering Chemistry by Dr. S. Rabindra and Prof. B.K. Mishra ; Kumar and Kumar

3. A Text Book of Applied Chemistry-I by SS Kumar; Tata McGraw Hill, Delhi

4. Progressive Applied Chemistry –I and II by Dr. G.H. Hugar; Eagle Prakashan,

5. Engineering Chemistry by Jain PC and Jain M, Dhanpat Rai Publishers, Delhi

6. Chemistry of Engineering by Aggarwal CV

7. Chemistry for Environmental Engineers by Swayer and McCarty, McGraw Hill, Delhi

DIP103P **APPLIED CHEMISTRY-I LAB** **L0:T0:P2**

LIST OF PRACTICALS

1. Volumetric analysis and study of apparatus used therein. Simple problems on volumetric analysis equation

2. Preparation of standard solution of oxalic acid or potassium dichromate

3. Determine the strength of solution of HCl with the help of a solution of NaOH and an intermediate solution of standard oxalic acid

4. Find the amount of chlorides in mg per liter in a sample of H_2O with the help of a solution of $AgNO_3$

5. Determine the degree of temporary hardness of water by EDTA titration

6. Estimation of total dissolved solids (TDS) in water sample gravimetrically

7. Estimation of total alkalinity of water volumetrically

8. Determine conductance, pH of water sample using conductance bridge and pH meter

9. Determine the percentage purity of commercial sample like blue vitriol, 12.5 g. of which have been dissolved per litre. Given M/20 $Na_2S_2O_3$.

10. Determination of solubility of a solid at room temperature

11. To verify the first law of electrolysis (electrolysis of copper sulphate solution using copper electrode)

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RATIONALE

Drawing is said to be the language of engineers and technicians. Reading and interpreting engineering drawing is their day-to-day responsibility. The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. The emphasis while imparting instructions should be to develop conceptual skills in the students.

Note:

1. First angle projection is to be followed
2. Instruction relevant to various drawings may be given along with appropriate demonstration, before assigning drawing practice to the students

DETAILED CONTENTS

UNIT 1

Drawing Office Practice, Lines & Lettering (2 Sheets)

Drawing instruments

Sizes and layout of standard drawing sheets and drawing boards

Different types of lines in engineering drawing as per BIS specifications

Free hand lettering (alphabet and numerals) lower case and upper case, single stroke vertical and inclined at 75 degree in different standard series of 2.5, 3, 5, 7, 10, and 15 mm heights in the ratio of 7:4

UNIT 2

Dimensioning (2 Sheets)

Necessity of dimensioning, Types of dimensioning (chain, parallel and progressive dimensioning, size and location dimensioning)

Methods of placing dimensioning (Aligned and unidirectional system), use of leader lines. General principles of dimensioning

Dimensioning of overall sizes, circles, thread holes, chamfered surfaces, angles, tapered surface holes equally spaced on PCD, counter sunk hole counter bored holes, cylindrical parts, narrow space and gaps, radii, curves and arches.

UNIT 3

Simple Geometrical Constructions used in Engineering Practice (2 Sheets)

Construction of regular polygons (triangle, square, pentagon, hexagon) and circles

Ellipses (concentric circle method and Intersecting Arcs method)

12. Parabola (rectangle and tangent method), cycloid
13. Scale (2 sheets)4.1 Scale – their need and importance, Definition of representative fraction (R.F), find RF of given scale

UNIT 4

Construction of plain and diagonal scales

Principle of Projections (7 sheets)

Principle of orthographic projection and introduction to first angle projection and third angle projection

Projection of points situated in different quadrants (1 Sheet)

Projection of lines, Lines inclined to one plane and parallel to the other and vice versa (1^{st} &3^{rd} quadrants) (1 Sheet)

Projection of Planes: Planes perpendicular and parallel to either of the planes; planes perpendicular to one plane and parallel to the other or vice versa (1^{st} & 3^{rd} quadrants) (1 Sheet)

UNIT 5

Drawing 3 orthographic views of given objects (3 sheets, at least one sheet in 3^{rd} Angle Projection)

Identification of surfaces on drawn orthographic views from isometric object drawn (1Sheet)

Sectional Views (1 sheet)

Need for sectional views –Drawing of different conventions for materials in sections, conventional breaks for shafts, pipes, rectangular, square, angle, channel and rolled sections

Isometric Views (2 sheets)
Fundamentals of isometric projections (theoretical instructions) and isometric scales
Isometric views of combination of regular solids like cylinder, cone, cube, prism and pyramid

Development of Surfaces (2 sheets)
Parallel line method (Prism and cylinder)
Radial line method (Pyramid and Cone)

RECOMMENDED BOOKS

1. Elementary Engineering Drawing (in first angle projection) by ND Bhatt,
2. A Text Book of Engineering Drawing by Surjit Singh published by Dhanpat Rai
3. Engineering Drawing by PS Gill published by SK Kataria and sons, Delhi
4. Engineering Drawing by RB Gupta published by Satya Prakashan, New Delhi

DIP105P GENERAL WORKSHOP PRACTICE-I L1:T0:P4

RATIONALE

In order to have a balanced overall development of diploma engineers, it is necessary to integrate theory with practice. General workshop practices are included in the curriculum in order to provide hand on experience about use of different tools and basic manufacturing practices.

This course aims at developing general manual and machining skills in the students. Besides above, the development of dignity of labour, precision, safety at work place, team working and development of right attitude are the other objectives.

DETAILED CONTENTS (PRACTICALS)

Note: The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

The following shops are included in the syllabus:

1. Carpentry and Painting Shop-1
2. Fitting Shop
3. Welding Shop-I
4. Electric Shop –I
5. Smithy Shop

UNIT 1

Carpentry and fitting shop

Demonstration, function and use of commonly used hand tools. Care, maintenance of tools and safety measures to be observed.

Job I Marking, sawing, planning and chiseling & their practice

Introduction to various types of wooden joints, their relative advantages and uses.

Job II Preparation of half lap joint

Job III Preparation of Mortise and Tenon Joint

Demonstration of various methods of painting wooden items.

Introduction to various types of wood such as Deodar, Kail, Partal, Teak, Mango, Sheesham, etc. (Demonstration and their identification).

Job IV Preparation of surface before painting including primar coat

Job V Painting Practice by brush/roller/spray

UNIT 2

Fitting Shop

Introduction to fitting shop tools, common materials used in fitting shop, Identification of materials. (e.g. Steel, Brass, Copper, Aluminium etc.).Identification of various sections of steel such as Flat, Angle, Tee, Channel, Bar Girder, Square, Z-Section, etc.

Description and demonstration of various types of work benches. holding devices and files. Precautions while filling.

Description and demonstration of simple operation of hack-sawing, demonstration and description of various types of blades and their specifications, uses and method of fitting the blade.

Job I Marking of job, use of marking tools and measuring instruments.

Job II Filing a dimensioned rectangular or Square piece of an accuracy of ± 0.5mm

Job III Filing practice (Production of flat surfaces) Checking by straight edge.

Job IV Making a cutout from a square piece of MS Flat using Hand hacksaw.

Care and maintenance of measuring tools like calipers, steel rule, try square, vernier calipers, micrometer, height gauge, combination set. Handling of measuring instruments, checking of zero error, finding of least count.

UNIT 3

Welding Shop – I

Introduction to welding and its importance in engineering practice; types of welding; common materials that can be welded, introduction to welding equipment e.g. a.c. welding set, d.c. rectifier, Electrode holder, electrodes and their specifications, welding screens and other welding related equipment and accessories.

Electric arc welding, (ac. and dc.) precautions while using electric arc welding, Practice in setting current and voltage for striking proper arc.

Job I Practice of striking arc while using electric arc welding set.

Job II Welding practice on electric arc welding for making uniform and Straight weld beads

Various types of joints and end preparation.

Job III Preparation of butt joint by electric arc welding.

Job IV Preparation of lap joint by electric arc welding.

Job V Preparation of corner joint by using electric arc welding.

Job VI Preparation of Tee joint by electric arc welding.

UNIT 4

Electric Shop – I

Study, demonstration and identification of common electrical materials such as wires, cables, switches, fuses, ceiling roses, PVC Conduits, PVC Channels and allied items, tools and

accessories.

Study of electrical safety measures and demonstration about use of protective devices. Such as fuses, MCBs and relays

Job I Identification of phase, neutral and earth of domestic appliances and their connection to two pin/three pin, plugs.

Job II Preparation of a house wiring circuit on wooden board using fuse, Switches, socket, holder, ceiling rose etc. by PVC Conduit and PVC casing and capping.

Study of common electrical appliances such as electric iron, electric kettle, ceiling fan, table fan, electric mixer, electric Geyser, gas geyser, desert cooler, refrigerator, water purifier

Introduction to the construction of a Lead-acid battery and its working.

Job III Installation of inverter with battery and to connect two or more batteries in series and in parallel

Job IV Charging of a battery and testing it with the help of hydrometer and Cell Tester

UNIT 5

Smithy Shop

Demonstration and detailed explanation of tools and equipment used. Forging operations in Smithy shop. Safety measures to be observed in the smithy shop.

Demonstration and description of bending operation, upsetting operation, description and specification of anvils, swage blocks, hammers etc.

Demonstration and description of tongs, fullers, swages etc.

Job I To forge a L-Hook.

Job II To prepare a job involving upsetting process

Job III To forge a chisel

Job IV To prepare a cube from a M.S. round by forging method.

DIP106 **SOFT SKILLS-I** **L3:T0:P0**

RATIONALE

Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this subject is to enable the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the subject, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills, correspond with others and enhance skills in spoken English.

DETAILED CONTENTS

UNIT 1

Facets of Literature

Short Stories
Homecoming – R.N. Tagore
The Selfish Giant - Oscar Wilde
The Diamond Necklace- Guy- De Maupassantt

Prose

I Have A Dream – Martin Luther King
On Habits – A. G. Gardiner
My struggle for An Education- Booker T Washington

Poems

Ozymandias – P.B. Shelley
Daffodils – William Wordsworth
Stopping by Woods on a Snowy Evening – Robert Frost

UNIT 2

Grammar and Usage

Parts of speech
Nouns
Pronouns
Adjectives
Articles
Verbs
Adverbs
Prepositions

Conjunction
Interjection
Identifying parts of speech
Using a word as different parts of speech

Pair of words (Words commonly confused and misused)

Tenses
Correction of incorrect sentences
One word substitution
Forms of verbs (100 words)

UNIT 3

Translation & Comprehension
Translation
Glossary of Administrative Terms (English/ Hindi/Urdu)
Translation from Urdu into English
Comprehension
Unseen passages of literature
Scientific data/graph based for comprehension exercises

UNIT 4

Paragraph of 100-150 words from outlines

UNIT 5

Communication

Definition, Introduction and Process of Communication
Objectives of Communication
Essentials of Communication

RECOMMENDED BOOKS

1. English and Communication Skills, Book-I By Kuldip Jaidka, Alwinder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh Published By Abhishek Publication, 57-59, Sector-17, Chandigarh
2. Rich Vocabulary Made Easy by Kuldip Jaidka , Mohindra Capital Publishers, Chandigarh
3. Spoken English (2nd Edition) by V Sasikumar & PV Dhamija; Published by Tata MC Graw Hills, New Delhi.
4. Spoken English by MC Sreevalsan; Published by M/S Vikas Publishing House Pvt. Ltd; New Delhi.
5. Spoken English –A foundation course (Part-I & Part-II) By Kamlesh Sdanand & Susheela Punitha; Published by Orient BlackSwan, Hyderabad

6. Practical Course in English Pronunciation by J Sethi, Kamlesh Sadanand & DV Jindal; Published by PHI Learning Pvt. Ltd; New Delhi.
7. A Practical Course in Spoken English by JK Gangal; Published by PHI Learning Pvt. Ltd; New Delhi.
8. English Grammar, Composition and Usage by NK Aggarwal and FT Wood; Published by Macmillan Publishers India Ltd; New Delhi.
9. Business Correspondence & Report writing (4th Edition) by RC Sharma and Krishna Mohan; Published by Tata MC Graw Hills, New Delhi.
10. Business Communication by Urmila Rani & SM Rai; Published by Himalaya Publishing House, Mumbai.
11. Business Communication Skills by Varinder Kumar, Bodh Raj & NP Manocha; Published by Kalyani Publisher, New Delhi.
12. Professional Communication by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.
13.
14. Business Communication and Personality Development by Bsiwajit Das and Ipseeta Satpathy; Published by Excel Books, Delhi
15. Succeeding Through Communication by Subhash Jagota; Published by Excel Books, Delhi
16. Communication Skills for professionals by Nira Konar; Published by PHI Learning Pvt. Ltd; New Delhi.
17. Developing Communication Skills (2nd Edition) by Krishna Mohan & Meera Banerji; Published by Macmillan Publishers India Ltd; New Delhi.
18. Effective Technical Communication By M .Ashraf Rizwi; Published by Tata MC Graw Hills, New Delhi.
19. Basic Communication Skills for Technology by Andrea J Rutherfoord; Published by Pearson Education, New Delhi
20. Technical Communication- Principles & Practices by Meenakshi Raman & Sangeetha Sharma; Published by Oxford University Press, New Delhi.
21. Technical English by S. Devaki Reddy & Shreesh Chaudhary; Published by Macmillan Publishers India Ltd; New Delhi.
22. Advanced Technical Communication, by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.

DIP106P **LANGUAGE LAB-I** **L0:T0:P2**

LIST OF PRACTICALS

1. Locating a Book in Library
2. To look up words in a Dictionary: meaning and pronunciation of words as given in the standard dictionary using symbols of phonetics
3. To seek information from an Encyclopedia
4. Listening pre-recorded English language learning programme
5. Paper reading before an audience (reading unseen passages)
6. Study of spelling Rules
7. Study of essentials of a good speech to respond and comprehend visual, oral themes, situations or stimulus and practice before select gathering (Making an oral presentation with stress on body language and voice modulation)
8. Exercises on use of different abbreviations
9. Greetings for different occasions
10. Introducing oneself, others and leave taking
11. Exercises on writing sentences on a topic