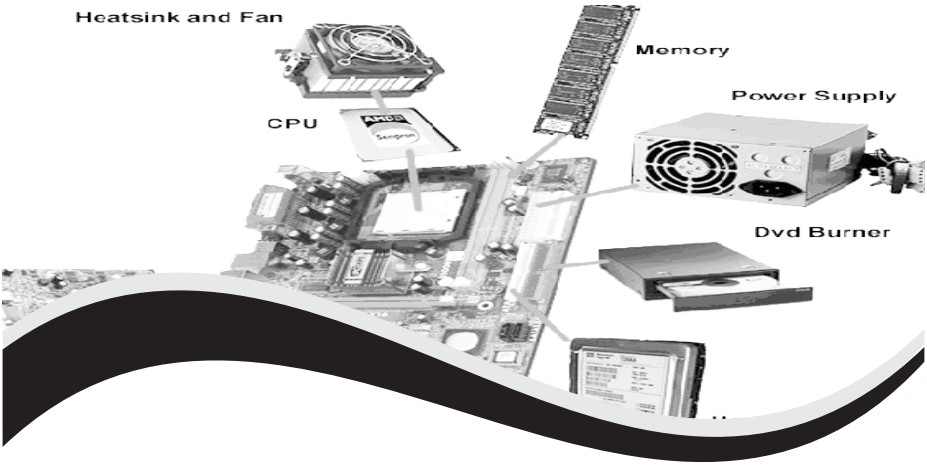
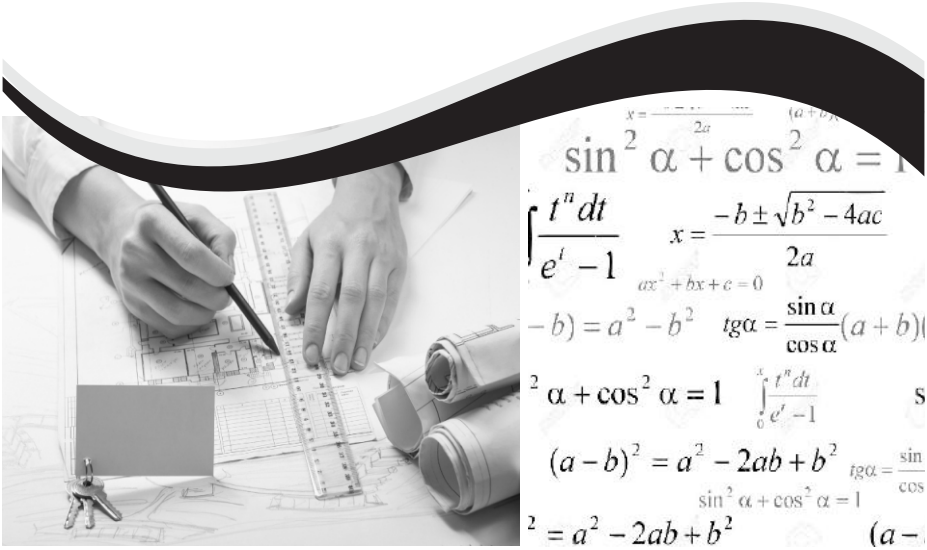


EVALUATION SCHEME
DETAIL SYLLABUS
FIRST & SECOND SEMESTER
(ENGINEERING)



UTTARAKHAND BOARD OF TECHNICAL EDUCATION

JOINT ENTRANCE EXAMINATION AND TRAINING, RESEARCH DEVELOPMENT CELL, DEHRADUN

STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME

BRANCH NAME–COMMON TO ALL ENGINEERING BRANCHES **SEMESTER –FIRST**

Subject Code	Subject	L	T	P	TOT	EVALUATION SCHEME						Total Marks	Credit Point
		Period/Weeks				Internal		External					
						Theory	Practical	Theory		Practical			
						Max Marks	Max Marks	Max Marks	Hrs.	Max Marks	Hrs.		
991001	English and Communication Skills -I	3	1	2	6	20	30	50	2:30	50	3:00	150	3
991002	Applied Mathematics –I	3	2	-	5	50	-	100	2:30	-	-	150	4
991003	Applied Physics -I	3	1	2	6	25	25	50	2:30	50	3:00	150	4
991004	Applied Chemistry –I	3	1	2	6	25	25	50	2:30	50	3:00	150	3
991005	Computer Fundamentals	2	-	3	5	10	10	50	2:30	30	3:00	100	3
991006	Engineering Graphics –I	8	-	-	8	50	-	100	3:00	-	-	150	4
991007	General Workshop Practice -I	-	-	8	8	-	50	-	-	50	3:00	100	4
991051	General Proficiency#	-	-	4	4	-	25	-	-	-	-	25	-
991052	Industrial Exposure (Assessment at Inst. Level)+	-	-	-	-	-	25	-	-	-	-	25	-
	TOTAL	**22**	**5**	**21**	**48**	**180**	**190**	**400**	**-**	**230**	**-**	**1000**	**25**

#General Proficiency will comprise of various co-curricular activities like games, hobby clubs, seminars, declamation contests, extension lectures, NCC, NSS, cultural activities and discipline etc.

+Industrial visit compulsory at minimum 2 industry or department.

Note:1- Each period will be 50 minutes. 2-Each session will be of 16weeks. 3-Effectiveteaching will be at least 12.5 week

Common Semester Code -99

UTTARAKHAND BOARD OF TECHNICAL EDUCATION

JOINT ENTRANCE EXAMINATION AND TRAINING, RESEARCH DEVELOPMENT CELL, DEHRADUN

STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME

BRANCH NAME–COMMON TO ALL ENGINEERING BRANCHES **SEMESTER – SECOND**

Subject Code	Subject	L	T	P	TOT	EVALUATION SCHEME						Total Marks	Credit Point
						Internal		External					
		Period/Weeks				Theory	Practical	Theory		Practical			
						Max Marks	Max Marks	Max Marks	Hrs.	Max Marks	Hrs.		
992001	English and Communication Skills –II	3	1	2	6	20	30	50	2:30	50	3:00	150	3
992002	Applied Mathematics –II	3	2	-	5	50	-	100	2:30	-	-	150	4
992003	Applied Physics –II	3	1	2	6	25	25	50	2:30	50	3:00	150	4
992004	Applied Chemistry –II	3	1	2	6	25	25	50	2:30	50	3:00	150	3
992005	Environmental Science & Energy Management	3	-	-	3	20	-	80	2:30	-	-	100	2
992006	Engineering Graphics–II	8	-	-	8	50	-	100	3:00	-	-	150	4
992007	General Workshop Practice -II	-	-	8	8	-	50	-	-	50	3:00	100	5
992051	General Proficiency#	-	-	6	6	-	25	-	-	-	-	25	-
992052	Industrial Exposure (Assessment at Inst. Level)+	-	-	-	-	-	25	-	-	-	-	25	-
TOTAL		**23**	**5**	**20**	**48**	**190**	**180**	**430**	**-**	**200**	**-**	**1000**	**25**

#General Proficiency will comprise of various co-curricular activities like games, hobby clubs, seminars, declamation contests, extension lectures, NCC, NSS, cultural activities and discipline etc.

+Industrial Exposure compulsory at minimum 2 Industries or Departments.

Note:1- Each period will be 50 minutes. 2- Each session will be of 16weeks. 3- Effective teaching will be at least 12.5 week

Common Semester Code -99

DETAIL SYLLABUS
FIRST SEMESTER
(ENGINEERING)

English and Communication Skills –I

L	T	P
3	1	2

Subject Code : 991001

COURSE OUTCOME

After completing this course, the learner will be able to acquire all the five areas of language learning –listening, speaking, reading, writing. While reading and writing skills are parts of theory component, listening and speaking skills will be transmitted through lessons in the practical component. Understanding skills, on the other hand, shall be gained both in theory and practical sessions .

Learning objectives in different areas are defined as follows:

I - Reading Skills:

After completing this course, the learner will be able to read and comprehend texts from simple to moderate levels of difficulty.

II - Writing Skills:

After completing this course, the learner will be able to

- Write simple to moderately complex sentences.
- Develop a simple idea into a short paragraph.
- Write business and personal letters at a functional level.
- Write specific formats like circulars, notices, press release. memo, agenda and minutes, e-mail, resume.

III - Listening Skills:

After completing this course, the learner will be able to listen and understand

- The spoken communication of fellow workers.
- News broadcast on TV and Radio.
- Lectures available on the internet.
- Films and shows in theatres and on TV.

IV - Speaking Skills:

After completing this course, the learners will be able to communicate ideas with moderate fluency of speech to their fellow-listeners, using moderately correct speech forms and pronunciation so as to be understandable to a mixed English-speaking audience.

V - Understanding Skills: After completing this course, the learners will be able to interpret the common and technical conversation in the language.

Methodology of Revision

Among the five skills listed in the Objectives of the Course, the two skills of Listening and Speaking will be part of practical classes, and will also be tested through Practical Examination. The two skills of Reading and Writing are exclusively the theoretical part of the Course. The fifth skill of Communication has both theoretical and practical components.

All the five skills are to be taught in both the Semesters. The basics of each component will be covered in Semester I, and relatively advanced topics to be covered in Semester II.

THEORY **Total Marks 40%**

1. Literature: Prose Reading of newspapers, magazines and similar writings is almost a day-to-day requirement for any educated person. To train the learner in reading simple prose texts, we offer a selection of six essays by eminent authors. These essays are chosen both for their content and style. Three of the essayists are from modern India. The content has a contemporary relevance. The style is simple and engaging, and diction is of an average difficulty level. Suggested authors are: Vivekananda, Gandhi . Among the English authors, we have chosen simple and short essays. Suggested essays are: Booker T. Washington-"My Struggle for an Education; Oliver Goldsmith - "The Man in Black"; Stevenson- "A Night Among the Pines".

2. Unseen Comprehension Passage. Preferably, from popular newspapers and magazines.

Language and Writing Skills : Basics **Total Marks: 30%**

A. Semester I - Language and Writing Skills: Basics

1. Parts of Speech

a) Noun
b) Pronoun
c) Verb
d) Adjective
e) Adverb
f) Preposition, Articles
g) Conjunction
h) Interjection

2. Tenses

3. Translation of a simple passage from Hindi to English

4. Paragraph Writing: Expanding a simple idea into a paragraph.

5. Letter Writing:

a) Business Letters
b) Personal Letters

6. Vocabulary:

a) Synonyms

b) Antonyms

c) Homophones

d) One word substitution

III. Communication Skills **Total Marks: 30%**

A. Semester I - Basics

Foundations of Communication Skills

a) Importance of Communication

b) Communication as a Process

c) Methods of Communication: Verbal and Nonverbal

d) Channels of Communication: Formal and Informal

ECS SYLLABUS
SEMESTER - I (THEORY)

I. Reading Skills: **(18 Periods)**

A. Literature: Prose

1. Vivekananda :Hinduism (1893 Chicago)
2. Gandhi : On Education (From Hind Swaraj)
3. Oliver Goldsmith - "The Man in Black"
4. R L Stevenson - "A Night Among the Pines" "
5. Booker T. Washington-"My Struggle for an Education"

B. Unseen Comprehension Passage. Preferably from popular newspapers and magazines.

II. Writing Skills: **(15 Periods)**

Language

1. Parts of Speech

a) Noun

b) Pronoun

c) verb

d) Adjective

e) Adverb

f) Preposition, Articles

g) Conjunction

e) Interjection

2. Tenses

3. Translation of a simple passage from Hindi to English

4. Paragraph Writing: Expanding a simple idea into a paragraph.

5. Letter Writing:

a) Business Letters

b) Personal Letters

6. Vocabulary:

a) Synonyms

b)Antonyms

c)Homophones

d)One word substitution

III. Communication Skills **(15 Periods)**

a) Importance of Communication

b) Communication as a Process

c) Methods of Communication: Verbal and Nonverbal

d) Channels of Communication: Formal and Informal

SEMESTER - I (PRACTICALS)

(Listening, Speaking and Communication Skills)

I. Phonetics

A. Introduction

B. Basic Sounds of English

1. Vowels and Consonants
2. Phonetic Transcription
3. Rules of Pronunciation
4. Problem Sounds

C. Syllables

D. Word Stress

II. Conversation: Basic Communication

A. Starting a Conversation

1. Greetings
2. Introducing Oneself
3. Introducing Others
4. Leave Taking
5. Thanking, Wishing Well

B. Conversation in a Context

1. Offering - Responding to Offers
2. Requesting - Responding to Requests
3. Congratulating
4. Expressing Sympathy and Condolences
5. Expressing Disappointments
6. Asking Questions - Polite Responses
7. Apologising - Forgiving
8. Complaining
9. Persuading
10. Warning
11. Asking for and Giving Information
12. Giving Instructions
13. Getting and Giving Permission
14. Asking for and Giving Opinion

Suggested distribution of marks

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	18	40
2	15	30
3	15	30
Total	**48**	**100**

Reference/text Book

1. Developing Communication Skills By Krishna Mohan & Meera Banerjee (Trinity Press, New Delhi)
2. Communication Skilla By Sanjay Kumar And Pusph Lata (Oxford Univ Press, New Delhi).
3. Wren & Martin High School English Grammar & Composition (S. Chand, New Delhi).
4. English & Communication Skills-1 By Vinit Kumar (Book World, Dehradun)
5. Communication Effectively In English, Book-1 By Revathi Srinivas, Abhisekh Publications, Chandigarh.
6. High School English Grammer And Composition By Wren & martin, S. chand Publication & Company Ltd. Delhi.
7. Communication Technics And Skill By R.K. Chadha; Dhanpat Rai Publications, New Delhi.

Applied Mathematics-I

L	T	P
3	2	-

Subject Code : 991002

1. RATIONALE

Mathematics is the core course to develop the competencies of most of the technological courses. The subject Applied Mathematics is being introduced into the diploma course to provide mathematical background to the students so that they can be able to grasp the engineering subjects properly. Applied Mathematics is widely used in every engineering fields. Mathematics is more than too for solving problems; mathematics course can develop intellectual maturity. This course is an attempt to initiate the multi-dimensional logical thinking and reasoning capabilities. It will help to apply the principles of basic mathematics to solve related technology problems. Hence, the course provides the insight to analyze engineering problems scientifically using determinants, matrices, trigonometry, complex number, Derivatives & application of derivatives.

2. COURSE OUTCOMES

The theory practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

a. Apply the concepts of algebra to solve engineering related problems.

b. Utilize basic concepts of trigonometry to solve elementary engineering problems.

c. Solve the problems based on limit & derivatives.

d. Use basic concepts of Set theory to solve engineering related problems.

3. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop LOs in cognitive domain for achieving the COs to attain the identified competency.

Unit – I (Algebra) **(25 Periods)**

1.1 Value of ${}^{n}P_{r}$ & ${}^{n}C_{r}$ (Without proof), Binomial theorem-(without proof) for positive integral index (expansion, general term, middle term) and for any index (expansion).

1.2 Partial fractions- (linear factors, repeated linear factors, non reducible quadratic factors only).

1.3 Determinants-Definition, Properties of determinants, Expansion of determinants (of order 2 and 3), Solution of simultaneous equations using Cramer's rule (in 2 and 3 unknowns).

1.4 Matrices- Definition of matrix, addition, subtraction, multiplication of matrices (upto 3 order), singular and non singular matrices, Adjoint of a matrix, Inverse of a matrix by adjoint method (up to 3x 3 only).

1.5 Sets: Sets and their representation, Empty set, finite and infinite sets, equal sets, subsets, power set, universal set, operation on sets, complement of set.

Unit – II (Trigonometry) (15 Periods)

1.1 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 - III (Complex Number) (10 Periods)

1.1 Definition of complex numbers, Real and imaginary parts, Polar and Cartesian form and their conversion, Conjugate , Modulus and argument of a complex number, Addition, Subtraction, multiplication, division of complex numbers.

1.2 De-Moiver's Theorem (statement only) related simple problems, nth root of unity.

Unit – IV (Differential Calculus) (30 Periods)

1.1 Function: Definitions of variables, constants, open & closed intervals.

1.2 Definitions & types of functions-simple examples.

1.3 Concept & definition of Limit.

1.4 Standard limits of algebraic, trigonometric, exponential & logarithmic functions-simple problems. Examine the Continuity of a function at any point (simple problem only).

1.5 Differentiation by (first principal) or by definition of differention x^n, sin x, cos x, tan x, e^x, $\log_a x$ only .

1.6 Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

1.7 Differentiation of trigonometric inverse functions. Logarithmic differentiation. Exponential differentiation, Successive differentiation (up to third term only).

1.8 Application (a) Maxima and minima (b) Equation of tangent and normal to a curve (for explicit functions only) (c) L' Hospital rule for solving in in determinates form ($\frac{0}{0}, \frac{\infty}{\infty}$)

Suggested distribution of marks

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	25	30
2	15	20
3	10	15
4	30	35
Total	**80**	**100**

Reference Book/Text Book

1. Higher Algebra By Hall & Knight
2. Plane Trignometry By S.L. Loney
3. Engineering Mathematics By Sastry (Phi Learning)
4. Engineering Mathematics By B.S. Grewal (Khanna Publishers)
5. Engineering Mathematics By A.B. Mathur (Khanna Publishers)
6. Applied Mathmatics-I & II, By M.K. Kanyal (Khanna Publishers, New Delhi)
7. Applied Mathematics-I, By Dr A.K. Sinha, Satyaprakashan, New Delhi
8. Engineering Mathematics, By C.B. Gupta, S.R. Singh, Mukesh Kumar, Mc Graw Hill Education.
9. Applied Mathematics By R.D. Sharma, Dhanpat Rai Publications, New Delhi
10. Engineering Mathematics, Vol-I & II, By S.S. Sabrwal And Sunita Jain, Eagle Prakashan, Jalandher
11. Basic Engineering Mathematics, By Jhon Bird, Newnes Publications.
12. A Text Book Of Engineering Mathematics, By A. Ganesh, G. Balasubramnium.
13. Polytechnic Mathematics, By Dr. D.S. Prakash, S. Chand, Publications, New Delhi.
14. A Text Book Of Engineering Mathematics, By N.P. Bali & Dr. Manish Goyal, Kindly Publication.
15. Engineering Mathematics, By C.B. Guta, S.R. Singh & Mukesh Kumar, Mc Graw-Hill Publications, Delhi
16. Applied Mathematics, By Kapoor, Nav Distributor, Meerut.

APPLIED PHYSICS – I

L	T	P
3	1	2

Subject Code : 991003

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-I (Measurement and Errors) (06 Periods)

Definition of Physics, Fundamental forces in nature, Physical quantities

Units - fundamental and derived units, systems of units (FPS, CGS, MKS and SI units) Dimensions of physical quantities.

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

Unit-II (Force and Motion) (14 Periods)

Force: Newton's laws of motion, Types of inertia and its examples.

Linear momentum and conservation of linear momentum, impulse and its applications, simple numerical problems in brake system of vehicles and trains etc.

Lever and its uses

Concept of Scalar and Vector quantities – examples, types of vectors.

Resolution and Composition of vectors, Vector multiplication (scalar product and vector product of two vectors) and its physical significance, addition of vectors (Parallelogram law)

Friction: Types of friction and its applications.

Circular motion: Angular displacement, angular velocity and angular acceleration

Relation between linear and angular velocity,linear and angular acceleration

Centripetal force (derivation) and centrifugal force with application such as banking of roads and bending of cyclists

Applications of various forces in lifts

Unit-III **(06 Periods)**

Rotational Motion

Concept of translatory and rotatory 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 motion in transport vehicles, trains and aeroplane turbine/engine.

Unit-IV **(08 Periods)**

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

Work -Energy Theorem

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

Unit-V **(10 Periods)**

Properties of Matter

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

Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure. Pascal's law (concept only). Bernoulli's Theorem (concept and examples only).

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 terminal velocity, effect of temperature on viscosity.

Unit-VI **(08 Periods)**

Thermometry

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-VII **(12 Periods)**

Waves and Vibrations

Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency and Energy in S.H.M. Time period of Simple pendulum.

Wave motion: transverse and longitudinal wave motion with examples,

Equation of simple harmonic progressive wave

Sound and Light waves, velocity, frequency and wave length of a wave, Musical Sound and Noise

Free, forced and resonant vibrations with examples

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

Ultrasonic – production (Magnetostriction and piezoelectric methods) and their engineering and medical applications.

LIST OF PRACTICALS (Perform minimum Six experiments)

1. To find the Least count of given different measuring equipments (eg. voltmeter, ammeter, stop watch, vernier callipers etc).
2. To find the diameter of wire using a screw gauge
3. To find volume of solid cylinder and hollow cylinder using a vernier callipers
4. To determine the radius of curvature using a Spherometer
5. To find the time period of a simple pendulum and determine the length of second's pendulum.
6. To verify parallelogram law of forces
7. To determine the viscosity of given liquid by Stoke's method
8. To determine the coefficient of friction on horizontal plane.
9. To determine the Young's Modulus by Searle's apparatus
10. To determine force Constant of spring using Hooke's Law.

INSTRUCTIONAL STATREGY

Teacher may use various teaching aids like models, charts, graphs and experimental kits etc. for imparting effective instructions in the subject. The teacher should explain about field applications before teaching the basics of mechanics, work power and energy, rotational motion, properties of matter etc. to develop proper understanding of the physical phenomenon. Use of demonstration can make the subject interesting and develop scientific temper in the students.

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	06	15
2	14	20
3	06	10
4	08	10
5	10	15
6	08	10
7	12	20
TOTAL	**64**	**100**

Reference/Text Book

1. Applied Physcis By Arthur Beiser (Mcgraw Hill Education, New Delhi)
2. Physics By Resnick & Halliday (Wiley India, New Delhi)
3. Engineering Physics By Gaur & Gupta(Dhantpat Rai, New Delhi)
4. Engineering Physics By Marikani (Phi Learning New Delhi)
5. Engineering Physics, By S.K. Malik, A.K. Singh, Mc Graw Hill Education.
6. Text Book Of Physics For Class XI (Part-I, Part-II) N.C.E.R.T
7. Text Book Of Physics For Class XII (Part-I, Part-II) N.C.E.R.T
8. Applied Physics Vol. I And Vol. II, TTTI Publications, Tata Mcgraw Hill, New Delhi.
9. Concepts In Physics By Hc Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi.
10. Berkeley Physics Course, Vol. I, II & III, Tata Mcgraw Hill, Delhi
11. Comprehensive Practical Physics, Vol. I & II, Jn Jaiswal, Laxmi Publishers
12. Engineering Physics By P.V. Naik, Pearson Education Pvt. Ltd, New Delhi
13. Applied Physics I & II By R.A. Banwait & R. Dogra, Eagle Parkashan, Jalandhar
14. Applied Physics By Jasmer Kaur And Bhupinder Singh, Lords Publications, Jalandhar
15. Applied Physics -1 By Dr Prajapati Palariya (Khanna Publishers, New Delhi)
16. Engineering Physics By Vanchna Singh And Sheeetal Kumar, Cengage Learning india Pvt. Ltd. Patparganj, Delhi
17. Applied Physics, By Ramakant, Nav Distributor, Meerut.

APPLIED CHEMISTRY - I

L	T	P
3	1	2

Subject Code : 991004

RATIONALE

The role of Chemistry and chemical products in every branch of engineering is expanding greatly. Now a days various products of chemical industries are playing important role in the field of engineering with increasing number of such products each successive years. The strength of materials, the chemical composition of substances, their behavior when subjected to different treatment and environment, and the laws of heat and dynamic energy have entered in almost every activity of modern life. Chemistry is considered as one of the core subjects for diploma students in engineering and technology for developing in them scientific temper and appreciation of chemical properties of materials, which they have to handle in their professional career. Effort should be made to teach this subject through demonstration and with the active involvement of students.

DETAILED CONTENTS

1. Atomic Structure (03 Periods)

1.1 Fundamental particles i.e. electron, proton and neutron, their characteristics (discovery is not included)

1.2 Electronic configuration of elements (up to Z = 30) with special reference to Aufbau principle, Pauli's exclusion principle, Hund's Rule and Haisenberg's uncertainity Principle.

1.3 Atomic mass, molecular mass and Equivalent mass with numerical problems.

2. Chemical Bonding (05 Periods)

2.1 Introduction, concept of valency, Octate rule Types of chemical bonding electrovalent, covalent and coordinate bond formation giving suitable examples to each and lewis dot structure.

2.2 Hydrogen bonding and its effect on physical properties of the compounds

3. Classification of Elements (04 Periods)

3.1 Morden periodic law, long form of periodic table.

3.2 Study of periodicity in physical and chemical properties with special reference to atomic and ionic radii, ionization potential, electron affinity, electro negativity .

3.3 Variation of effective nuclear charge in a period and metallic character.

4. Water Treatment **(16 Periods)**

4.1 Source of water Hard and soft water, hardness of water and its causes, disadvantages of hard water i) domestic use (ii)in industrial use, units of hardness, sludge and scale formation caustic embrittelment, boiler corrosion, foaming and priming in boilers.

4.2 Softening of water (i) Hot and cold Soda Lime process (ii) Permutit Process (iii) Ion-Exchange resin process. Simple numerical problems related to soda lime process.

4.3 Internal treatment of water carbonate conditioning, phosphate conditioning, colloidal conditioning, calgon conditioning.

4.4. Determination of hardness of water by (i) O'Hehner's Method (ii) E.D.T.A. Method

4.5 Qualities of water used for drinking purposes, treatment of river water to make it fit for town supply Disinfection of water by chlorination process.

5. Solutions **(12 Periods)**

5.1 Concept of solution and classification of solution. Definition of solute and solvant, brief introduction of the terms Ionization, Acidity, Basicity, equivalent weight and gram equivalent weight with suitable examples

5.2 Strength of a solution (i) Normality (ii) Molarity (iii) Molality as applied in relation to a solution with simple numerical problems related to these terms

5.3 Buffer solutions , indicators and it's theory. Solubility Product.

5.4 Definition of pH, and different industrial applications of pH, determination of pH of a solution with the help of pH meter including simple numerical problems.

6. Electrochemistry **(12Periods)**

6.1 Definition of the terms: Electrolytes, Non-electrolytes conductors and non conductors with suitable examples, Arrhenius theory of electrolytic dissociation.

6.2 Faraday's Laws of Electrolysis with simple numerical problems

6.3 Different industrial applications of 'Electrolysis' with special reference to electroplating, electrorefining and electrometallergy

7. Catalyst **(04 Periods)**

7.1 Definition of catalyst, type of catalyst and catalyses.

7.2 Characteristics of catalytic reaction.

7.3 Theory of Catalyses & mechanism of catalyses.

8. Environmental Chemistry (08Periods)

8.1 General concept of pollution and pollutants and type of pollution.

8.2 Factor effecting air, water, noise and soil pollution with special major to control of air and water Pollution.

8.3 Green house effect , ozone layer depletion, global warming , Acid rain and smog.

LIST OF PRACTICALS

1. Study of apparatus used in Volumetric analysis with digram.
2. Preparation of standard solution of oxalic acid or potassium dichromate or sodium hydroxide.
3. To analyse the two acidic and two basic radicals in the inorganic mixture from the following radicals
   a) Acidic Radicals Co_3--, SO4- -, NO3 -, CH3 COO -, Cl-, Br-, I-
   b) Basic Radicals NH4++, Pb+, Cu++, Cd++, As+++, Sb+++, Sn++, Al+++, Fe+++, Cr+++, Mn++, Ni++, Co++, Zn++, Ba++, Ca++ and Mg++,
4. Determine the degree of temporary hardness of water by O'Heher's method.
5. Estimation of total hardness of water by complexometeric titaration method.
6. Determine pH of a given sample by using pH meter
7. Determination of solubility of a solid at room temperature
8. Demonstration – Application of $FeCl_3$ in etching process for designing circuits on PCB (Printed Circuit Board)

SUGGESTED DISTRIBUTION OF MARKS

Topic no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	03	15
2	05	15
3	04	15
4	16	15
5	12	15
6	12	7.5
7	04	7.5
8	08	10
TOTAL	**64**	**100**

Reference Book/Text Book

1. Engineering Chemistry By Jain & Jain (Dhanpat Rai, Delhi)
2. Engineering Chemistry By S Sdara (S. Chand, New Delhi)
3. Engineering Chemistry By Kushal Quanongo (Phi Learning New Delhi)
4. Engineering Chemistry By O.P. Agarwal (Khanna Publishers, New Delhi)
5. Chemistry In Engineering By J.C. Kuriacose And J. Rajaram; Tata Mcgraw-Hill Publishing Company Limited, New Delhi
6. Engineering Chemistry By Dr. S. Rabindra And Prof. B.K. Mishra; Kumar And Kumar Publishers (P) Ltd. Bangalore-4
7. A Text Book Of Applied Chemistry-I By Ss Kumar; Tata Mcgraw Hill, Delhi
8. A Text Book Of Applied Chemistry-I By Sharma And Others; Technical Bureau Of India, Jalandhar
9. Applied Chemistry-I By Dr Indu Singh (Book World Dehradun)
10. Engineering Chemistry By Jain Pc And Jain M,
11. Chemistry Of Engineering By Aggarwal CV,
12. Chemistry For Environmental Engineers By Swayer And Mccarty, Mcgraw Hill, Delhi
13. Progressive Applied Chemistry –I And Ii By Dr. G.H. Hugar; Eagle Prakashan, Jalandhar
14. Chemistry In Engineering By J.C. Kuriacose And J. Rajaram, Tata Mc Graw-Hill Publication, Company Ltd, New Dehli.
15. Applied Chemistry, By Manju Bansal, Nav Distributor, Meerut.

Computer Fundamentals

L	T	P
2	-	3

Subject Code : 991005

Aim:

- To understand basics of Computer.
- To Learn various application software's
- To Learn Usage of Computer System in various Domains

Objective:

- Students will be able to understand a computer system that has hardware and software components, which controls and makes them useful.
- Students will be able to understand the operating system as the interface to the computer system and basic functions of an operating system.
- Students will be able to Set the parameter required for effective use of hardware combined with application software's
- Students will be able to Use file mangers, word processors, spreadsheets, presentation software
- Students will be able to use Internet to send mail and surf the World Wide Web.

Unit -1 Computer Introduction (06 Periods)

Introduction about the Data and information, Data Processing definition of computer, Block diagram of Computer System, Components of Computer, Classification of Computer (Analog and Digital), Computer Generation, Characteristics and Applications of Computer, Input and Output Devices, Printer -Inkjet & Laser Printer, Memory- Primary Memory (RAM, ROM, PROM, EPROM EEPROM & UVEPROM, Secondary Memory Devices (Hard Disk, Optical Disk, PEN Drive, OTG, Magnetic Tape) and Memory Tree, CPU Types, Level of Programming Languages, Overview of Instruction, Program, System Software and Application Software.

Unit -2: Number System (06 Periods)

Binary, BCD, Grey Code, 3 Excess Code, Octal, Decimal, Hexadecimal Number System, Conversion of Numbers- Decimal to Binary, Decimal to Octal, Decimal to Hexadecimal, Binary to Octal, Binary to Hexadecimal, Octal to Hexadecimal, Hexadecimal to Octal, Floating Point Numbers, Addition and Subtraction of Binary Numbers.

Unit -3 Operating System (04 Periods)

Operating System- Definition, Goals and Responsibilities, Window based Operating System, Open Source based Operating System, Single User and Multiuser Operating

System, Multi Programming and Real Time Operating System, GUI V/s CUI, Commands of MS DOS (Create, Read, Edit, Display, Copy, Move, Rename and Delete Operations on Files and Directory).

Unit -4 Networks & Internet (04 Periods)

Definition of Network, LAN, MAN, WAN, Network Devices, Tools and cables (Switch, Router, Modem, RJ45, CAT Cable, OFC, LAN Tester, Crimping Tool) Network Topology, Protocols (HTTP, URL, FTP), Internet, ISP, Web Browser and web server, Email, www, Search Engine.

Unit –5 Office Application (08 Periods)

Word- Create, Open, Save, Update Files, Word Art, Clip Art, Insert Images, Header & Footer, Table (Insert, Merge, Split Cells, Border & Shading), Page Layout, Page Setup- Margin, Orientation, Page Background- Watermark, Page Border, Paragraph- Indent, Spacing and Text Alignment, Text Formatting- Text Alignment, Sorting, Find & Replacement, Bullet & Numbering.

Excel- Worksheet, Formatting Cells, Insert Data Patterns Instantly, Format Painter, Hide Rows & Columns, Charts in Excel, Border & Shading, Sort & Filter, Find & Replace, Page Preview & Printing, Formulas, Calculation Sheet, Copy Formula OR Data Between Worksheets, Header &Footer.

PowerPoint – Create Slide, Design Patterns, Animation & Effects in slides, Slide Show.

UNIT-6 Role Of IT (04 Periods)

Information Technology- Information, Scope and role of Information Technology, Overview of Cyber Laws & IT Act, Ecommerce, e-Governance, National Informatics Centre, Payment Gateway, Overview of Net-Banking- NEFT & RTGS, Mobile Banking (SBI Buddy, RuPay, UPI, BHIM, e-Wallet), Introduction of Geographic Information System, Uses of GIS in Engineering, Optical Codes (MICR, OMR, Barcode, QR Code), Impact of computer on society, Applications of IT.

List of Practical's:

1. Working with Windows Latest Version- desktop, start icon, taskbar, Recycle Bin, My Computer and Control panel.
2. Exercise on Printing, Installing a printer driver, Setting up a printer , Default and installed printers, Controlling print queues, Viewing installed fonts, The clipboard and drag and drop.
3. Exercise on Text Formatting in Word document with Paragraph formatting, Bullets, page border and numbering, creating and using macros in a document.
4. Exercise on Page formatting, Page margins, Page size and orientation, Page breaks, Headers and Footers, Introducing tables- Rows and Columns.

5. Exercise on Development of application using mail merge, Mail merging addresses for envelopes and letter, printing addressed envelope and letter.
6. Formatting and customizing data, Formulas, functions and named ranges, creating, manipulating & changing the chart type in Spreadsheet.
7. Exercise on Preparing Presentation Slides- Opening and saving a presentation, Inserting Images, Slide show timings, Animation effects.
8. Exercise on Connecting to the Internet, Searching the Internet, Commonly used search engines, writing email, finding an e-mail address, Using electronic mail.
9. Exercises on External and Internal Commands of MS DOS.
10. Create Business Cards using Shapes, text, and color.

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	06	20
2	06	15
3	04	15
4	04	15
5	08	20
6	04	15
TOTAL	**32**	**100**

Reference/Text Book

1. Computer Fundamentals By P.k. Sinha (Bpb Publications, New Delhi)
2. Computer Fundamentals By Anita Goel (Pearson Education, New Delhi)
3. Computer Fundamental 5th Edition By P.K. Sinha, Wadsworth, Inc
4. Fundamentals Of Computer By V. Rajaraman, Phi Publication.
5. Fundamental Problems In Computing 5th By D.J. Rosencrantz Springer.
6. Libre Office- The Documentation Foundation By Ron Faile, Jeremy Cartwright, Hal Parker.
7. Microsoft Office 2010 Course Pb (Hindi) Arti Rathore, Bpb Publication.
8. English Communication Skills, By R.K. Tyagi, Nav Distributor, Meerut.

ENGINEERING GRAPHICS – I

L	T	P
8	-	-

Subject Code : 991006

RATIONALE

Engineering Graphics is said to be the language of engineers and technicians. Reading and interpreting engineering graphics 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 graphics, 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 graphics may be given along with appropriate demonstration, before assigning graphic practice to the students
3. S.P. 46.1988 should be followed
4. Minimum of 15 sheets to be prepared by each student

DETAILED CONTENTS

Unit 1. Drawing Office Practice, Lines & Lettering (2 Sheets) (06 Periods)

Graphics instruments and their uses, Sizes and layout of standard graphic sheets and graphic boards, Different types of lines in engineering graphics as per BIS specifications Free hand lettering (alphabet and numerals) lower case and upper case, single stroke vertical and inclined at different standard series of 2.5, 3, 5, 7, 10, and 15 mm heights.

Unit 2: Dimensioning (2 Sheets) (06 Periods)

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: Geometrical Constructions (4 Sheets) (12 Periods)

Simple geometrical Constructions; Constructions of regular polygons (triangle, square, pentagon, hexagon) and circle, Ellipses (concentric circle method and

Intersecting Arcs method ,Directrix and focus method), Parabola (rectangle and tangent method, Directrix and focus method) Hyperbola (Directrix and focus method, Transverse axis and focus method), Cycloids, Epicycloids, Hypocycloids, involutes of regular polygons and circles , Helix: (conical, parallel, Spiral).

Unit 4: . Scale (2 sheets) (12 Periods)

Scale – their need and importance, Definition of representative fraction (R.F),find RF of given scale , Construction of plain and diagonal scales

Unit 5: Principle of Projections (6 sheets) (15 Periods)

Principle of orthographic projection and introduction to first angle projection and third angle projection, Projection of points situated in different quadrants, Projection of lines, Lines inclined to one plane and parallel to the other and vice versa (all quadrants); Line inclined to both reference planes (HP and VP) and limited to both ends in same quadrant. Projection of Planes triangular, square, rectangular, pentagonal, hexagonal and circular) ,Planes perpendicular to one refrence plane and parallel to other, planes inclined to one refrence plane and perpendicular to other or vice versa (1st& 3rd quadrants), Projection of solids, such as Prism, ,Pyramid (triangular, square, rectangular, pentagonal hexagonal), Cone, Cube, Cylinder Tetrahydron, Frustum with axis perpendicular to one refrence plane and axis inclined to one refrence plane and parallel to other refrence plane. Orthographic views of given pictorial views (1st and 3rd angle)

Unit 6. Isometric Projections (2 sheets) (15 Periods)

Fundamentals of Isometric projections/views (Theoretical instructions) and Isometric Scales , Isometric views/projections of different types of planes, Isometric views/projections of different types of solids , Isometric views/projections of combination of regular solids like cylinder, cone, cube, prism and pyramid, Conversion of Isometric views from given Orthographic projections.

Unit 7. Symbols and Conventions (2 sheets) (15 Periods)

Civil engineering sanitary fitting symbols , Electrical fitting symbols for interior installations, Electronic symbols.

Unit 8. Q CAD (for practical's and viva only) (15 Periods)

Introduction of Qcad Window, Drawing Tools, Snap Tools, Drawing Area, Status Line, List Docking Area, Loading and Naming Files, Saving Files, Don't Overwrite, Fileload Auto, Zoom, Grid Scale Adjusts to File, Pen Toolbar, Zoom Auto Tool, Help Menu, Grid Dots Control, Coordinate Display, Mouse Status.Coordinate System- Types of Coordinates, Center of Origin, Drawing Area Rulers, X-Y Coordinates, Polar Coordinates, Polar Angle Measurement, Relative Reference Point

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	6	8
2	6	8
3	20	12
4	20	12
5	30	25
6	16	20
7	15	15
8	15	-
Total	**128**	**100**

Reference/Text Book

1. Engineering Drawing By N.D. Bhatt (Charotar Pub House, Anand (Guj)
2. Engineering Drawing And Graphics+ Autocad By Venugopal (New Age Publication, Delhi)
3. Engineering Drawing By R.K. Dhawan (S. Chand Co.)
4. Engineering Drawing By C.M. Verma, Takniki parkashak, Roorkee.
5. A Text Book Of Engineering Drawing By Surjit Singh; Dhanpat Rai And Co., Delhi
6. Engineering Graphics – I By Vivek Goel (Book World, Dehradun)
7. Engineering Drawing By P.S. Gill; S.K Kataria And Sons, Delhi
8. Engineering Drawing By R.B. Gupta; Satya Prakashan, New Delhi.
9. Engineering Drawing, Ansul- S. Agarwal, Nav Distributor, Meerut.
10. Text book Of Engineering Drawing, By Prof. P.J. Shah, S. Chand Publications, New Delhi.

GENERAL WORKSHOP PRACTICE – I

L	T	P
-	-	8

Subject Code : 991007

RATIONALE

Work shop practice is the fundamental exposure to basic skill required for all students pursuing their studies in various diploma-engineering disciplines. The practice experience would help students to understand the intricacies of industrial Working in relatively shorter period of time more over the contents of this Curricula forms a basic link for higher studies of engineering programs

The students are advised to undergo each skill experience with know-how approach giving special emphasis to know-why for the various instructions imparted to them in each shop.

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.

1. INTRODUCTION TO WORK SHOP (20 Periods)

1.1 General Safety rules of workshop

1.2 State the General Safety Measures to be observed in Workshop.

1.3 State the General housekeeping activities

1.4 Prepare a list of general safety Rules to be followed in Workshop

2. FITTING SHOP (40 Periods)

2.1 Layout of Shop

2.2 Sketch & Label Details of shop Layout

2.3 Type of jobs produced in fitting shop

2.4 Understand the functions of fitting shop

2.5 Understand different Metals, Alloys & their Sections

2.6 List the Commonly used Metals, Alloys.

2.7 State at least Five Sections, Shape & Size of Metals, Alloys.

2.8 Use relevant IS Code for commonly used materials with their samples of different Cross sections.

2.9 Fitting tools.

2.10 Know use of fitting tools, sketch various tools & label their parts.

2.11 Classify fitting tools as marking tools, Clamping devices, striking tools, cutting tools etc.

2.12 Know the marking out & inspection instruments such as surface plate, marking block, scriber, tri square, Bevel protractor etc.

2.13 Fitting operation :- Use of Various fitting tools, inspection & measuring Instruments to produce given jobs.

2.14 Choose correct Shape & Size of Blank metal for a given drawing.

2.15 Marking as per drawing using correct method, tools & sequence.

2.16 Choose correct sequence of operations for the job viz. Sawing, filing, scraping, drilling & Tapping

2.17 Select appropriate Tools, inspection and measuring instruments.

2.18 Clamping the job in correct position in an appropriate clamping device.

2.19 Perform the operation with appropriate body posture, method & precision, exercising personal judgment of need of the force.

2.20 Inspect the job as and when necessary.

2.21 Introduction to screw threads.

2.22 Know common types of screw threads & the terminology used.

2.23 Sketch and label details of Metric & Whitworth thread.

3. CARPENTRY SHOP (40 Periods)

3.1 Carpentry shop lay out.

3.2 Sketch & Label Details of shop Layout.

3.3 Type of jobs produced in carpentry shop.

3.4 Understand the functions of carpentry shop.

3.5 Introduce type of jobs produced by carpenter.

3.6 Commonly used raw materials

3.7 Know commonly used raw materials &their commercially available size.

3.8 Name various type of raw materials used such as Timber: - logs, planks, battens etc. Ply, Teak ply, block board, sun mica, Formica etc.

3.9 Carpentry tools: - Know various carpentry tools with their specifications and uses e.g. Different saws, chisels, Files, gauges, scales, hammers, tri squares, planners, vice etc.

3.10 Carpentry Joints Introduction of various joints like T, corner, mortise & tennon joints, dovetail, pin, cross half lap joint, etc.

3.11 Choose correct shape &size of timber blank for a given job drawing.

3.12 Do marking as per drawing using correct method, tools &sequence.

3.13 Identify correct operations e.g. sawing, chiseling, planning, grooving etc.

3.14 Select appropriate Tool , inspection & measuring Instruments.

3.15 Clamping the jobs in correct position in an appropriate clamping device.

3.16 Perform the operation with appropriate body posture, method & precision, exercising personal judgment of need of the force

3.17 Inspect for size & quality of finish as and when necessary.

3.18 Assemble the components produced. Inspect for proper joint quality &take remedial steps.

4. ELECTRIC SHOP (28 Periods)

4.1 Study, demonstration and identification of common electrical materials such as wires, cables, switches, fuses, ceiling roses, PVC Conduits, PVC Channels and allied items, tools along with electrical instruments such as voltmeter, ammeter and multimeter

4.2 Study of electrical safety measures and demonstration about use of protective devices such as fuses, MCBs, ELCBs and relays including earthing

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

4.4 Preparation of a house wiring circuit on wooden board using fuse, switches, socket, holder, ceiling rose etc. in PVC conduit and PVC casing and capping wiring system

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

4.6 Introduction to lead-acid battery, identification of parts and its working.

4.7 Installation of inverter with battery and to connect two or more batteries in series and in parallel (knowledge of a.c. and d.c.)

4.8 Charging of a battery and testing it with the help of hydrometer and cell tester

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted (Hrs)	Marks Allotted (%)
1	20	20
2	40	30
3	40	30
4	28	20
TOTAL	**128**	**100**

Reference / Text book

1. Workshop Technology By R.S. Khurmi (S. Chandpublsihers)
2. Workshop Technology By Hajra Chaudhry Part 1 & 2 (Media Promoter, Mumbai)
3. Workshop Technology By T.L. Choudhary (Khanna Publishers, New Delhi)
4. Workshop Technology By Raghuvanshi Part 1 & 2 (Dhanpat Rai & Co.,)
5. Workshop Technology I, II, III, By S.K. Hajra, Choudhary And A.K. Chaoudhary. Media Promoters And Publishers Pvt. Ltd., Bombay
6. Workshop Technology By Manchanda Vol. I, II, III India Publishing House, Jalandhar.
7. Manual On Workshop Practice By K. Venkata Reddy, K.L. Narayana Et Al; Macmillan India Ltd. New Delhi
8. Basic Workshop Practice Manual By T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
9. Workshop Technology By B.S. Raghuwanshi, Dhanpat Rai And Co., New Delhi
10. Workshop Technology By H.S. Bawa, Tata Mcgraw Hill Publishers, New Delhi.

DETAIL SYLLABUS
SECOND SEMESTER
(ENGINEERING)

ENGLISH AND COMMUNICATION SKILL - II

L	T	P
3	1	2

Subject Code : 992001

COURSE OUTCOME

After completing this course, the learner will be able to acquire all the four areas of language learning –listening, speaking, reading, writing. While reading and writing skills are parts of theory component, listening and speaking skills will be transmitted through lessons in the practical component. Understanding skills, on the other hand, shall be gained both in theory and practical sessions .

Learning objectives in different areas are defined as follows:

I. Reading Skills:

After completing this course, the learner will be able to read and comprehend texts from simple to moderate levels of difficulty

II. Writing Skills:

After completing this course, the learner will be able to

- Write simple to moderately complex sentences.
- Develop a simple idea into a short paragraph.
- Write business and personal letters at a functional level.
- Write specific formats like circulars, notices, press release. memo, agenda and minutes, e-mail, resume.

III. Listening Skills:

After completing this course, the learner will be able to listen and understand

- The spoken communication of fellow workers.
- News broadcast on TV and Radio.
- Lectures available on the internet.
- Films and shows in theatres and on TV.

IV. Speaking Skills:

After completing this course, the learners will be able to communicate ideas with moderate fluency of speech to their fellow-listeners, using moderately correct speech forms and pronunciation so as to be understandable to a mixed English-speaking audience.

V. Understanding Skills: After completing this course, the learners will be able to interpret the common and technical conversation in the language.

Methodology of Revision

Among the five skills listed in the Objectives of the Course, the two skills of Listening and Speaking will be part of practical classes, and will also be tested through Practical Examination. The two skills of Reading and Writing are exclusively the theoretical part of the Course. The fifth skill of Understanding has both theoretical and practical components.

All the five skills are to be taught in both the Semesters. The basics of each component will be covered in Semester I, and relatively advanced topics to be covered in Semester II.

Theory **Total Marks 40%**

1. Literature: Fiction and Poetry. Fiction and Poetry are equally part of the reading regimen of any educated person. The lessons are to be equally divided among Indian and English authors. There will be three stories and three poems, six lessons in all. Suggested pieces/authors are: Fiction - Ruskin Bond, R K Narayan; Poetry: Shakespeare, Keats, Tagore

2. Unseen Comprehension Passage: Passages from stories and poems appearing in popular newspapers and magazines.

Language and Writing Skills: Advanced Specific writing skill Total Marks: 30%

a) Notice
b) Circulars
c) Memo
d) Agenda for a Meeting
e) Minutes of the Meeting
f) Press Release
g) E-Mail
h) Resume

Communication Skills **Total Marks: 30%**

1. Barriers to Communication

a) Barriers on the part of Sender
b) Barriers on the part of Receiver
c) Organisational and other barriers

2. Listening as a Tool of Communication

a) Importance of Listening and Empathy

b) Common Faults in Effective Listening

(1) Listening versus Hearing

(2) Poor Listening Habits

c) Improving Listening Skill

d) Humour in communication

ECS SYLLABUS
SEMESTER - II THEORY

I. Reading Skills: **(16 Periods)**

A Literature: Fiction and Poetry

1. Ruskin Bond : The Prospect Of Flowers
2. R K Narayan : An Astrologer's Day
3. Shakespeare :Let Me Not To The Marriage of True Minds (Sonnet No. 116)
4. John Keats : Ode To A Nightingale
5. Tagore : Thou Hast Made Me Endless (Verse-I Gitanjali)

B Unseen Comprehension Passage. Passages from stories and poems appearing in popular newspapers and magazines.

II. Language and Writing Skills: Advanced **(20 Periods)**

Specific writing skills

a) Notice

b) Circulars

c) Memo

d) Agenda for a Meeting

e) Minutes of the Meeting

f) Press Release

g) E-Mail

h) Resume

III. Communication Skills **(12 Periods)**

1. Barriers to Communication

a) Barriers on the part of Sender

b) Barriers on the part of Receiver

c) Organisational and other barriers

2. Listening as a Tool of Communication

a) Importance of Listening and Empathy

b) Common Faults in Effective Listening

(1) Listening versus Hearing

(2) Poor Listening Habits

c) Improving Listening Skill

d) Humour in communication

SEMESTER - II PRACTICAL

(Listening, Speaking and Communication Skills)

A. Interviews

1. Job Interviews

a) Stages of Interview

b) Face-to-face Interviews: Campus and On Site

c) Telephonic Interview

2. Media Interviews

3. Press Conference

B. Discussions

1. Introducing Oneself and Others
2. Leading and Directing Discussions
3. Expressing Opinions and Ideas
4. Expressing Agreement / Disagreement
5. Raising Questions

C. Group Discussions

1. Speaking in a Group Discussion
2. Discussing Problems and Solutions
3. Using Persuasive Strategies
4. Turn Taking Strategies
5. Effective Intervention
6. Reaching a Decision

D. Organisational GD

1. Brainstorming

2. Nominal Group Techniques
3. Delphi Technique
4. GD as Part of a Selection Process

E. Debate

1. Art of Debating
2. Debating Local Issues
3. Debating National Issues
4. Debating International Issues

F. Watching a Film / Visual Presentation

1. Summarizing the Film / Visual Presentation
2. Critically Appreciating the Main Points
3. Leading a Further Discussion and Debate

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	16	35
2	20	40
3	12	25
TOTAL	**48**	**100**

Reference/text Book

1. Developing Communication Skills By Krishna Mohan & Meera Banerjee (Trinity Press, New Delhi)
2. Communication Skilla By Sanjay Kumar And Pusph Lata (Oxford Univ Press, New Delhi).
3. Wren & Martin High School English Grammar & Composition (S. Chand, New Delhi).
4. English & Communication Skills-1 By Vinit Kumar (Book World, Dehradun)
5. Communication Effectively In English, Book-1 By Revathi Srinivas, Abhisekh Publications, Chandigarh.
6. High School English Grammer And Composition By Wren & martin, S. chand Publication & Company Ltd. Delhi.
7. Communication Technics And Skill By R.K. Chadha; Dhanpat Rai Publications, New Delhi.

Applied Mathematics-II

L	T	P
3	2	0

Subject Code : 992002

1. RATIONALE

Mathematics is the core course to develop the competencies of most of the technological courses. The subject Applied Mathematics is being introduced into the diploma course to provide mathematical background to the students so that they can be able to grasp the engineering subjects properly. Applied Mathematics is widely used in every engineering fields. Mathematics is more than too for solving problems, mathematics course can develop intellectual maturity. This course is an attempt to initiate the multi-dimensional logical thinking and reasoning capabilities. It will help to apply the principles of basic mathematics to solve related technology problems. Hence, the course provides the insight to analyze engineering problems scientifically using integration, application of integration, differential equation, coordinate geometry and statistics.

2. COURSE OUTCOMES

The theory practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

a. Apply the concepts of Integration to solve engineering related problems.

b. Utilize basic concepts of geometry to solve elementary engineering problems.

c. Apply the concept of differential equation to solve basic engineering problems.

d. Use basic concepts of statistics to solve engineering related problems.

3. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop LOs in cognitive domain for achieving the COs to attain the identified competency.

Unit. I Co-ordinate Geometry (25 Periods)

1.1 Equation of straight line in various standard forms (one point slope form, slope intercept form, two point form, intercept form & normal form), inter section of two straight lines, angle between two lines. Perpendicular distance formula.

1.2 General equation of a circle and its characteristics. To find the equation of a circle given (i) Centre and radius (ii) Three points on it (iii) Co-ordinates of end points of a diameter.

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

Unit. II Integral Calculus **(30 Periods)**

1.1 Integration as inverse operation of differentiation with simple examples.

1.2 Simple Standard integrals and related problems.

1.3 Simple integration by substitution, by parts and by partial fractions (for linear factors only).

1.4 Properties of definte integrals.

1.5 Evaluation of definite integrals (simple problems)-

Evaluation of $\int_0^{\pi/2} \text{Sin } x\,dx$, $\int_0^{\pi/2} \text{Cos}^n x\,dx$, $\int_0^{\pi/2} \text{Sin}^m x \text{ Cos}^n x\,dx$,

using formulae without proof (m and n being positive integers only)

1.6 Applications of integration for :

(a) Simple problem on evaluation of area bounded by a curve and axes.

(b) Calculation of volume of a solid formed by revolution of an area about axes (Simple problems).

(c) Numerical integration by Simpsons′s Rule and Trapezoidal Rule (Simple problems).

Unit. III Ordinary Differential Equations **(10 Periods)**

1.1 Definition, Order, Degree, Linear and Non-linear differential equations.

1.2 Formation of differential equations (upto second order).

1.3 Solution of first order differential equation-

(a) Variable Separable (b) Homogeneous (c) Reducible to Homogeneous (d) Linear differential equation (e) Bernoulli's Equation (simple problem) (f) Exact differential Equation.

Unit. IV Statistics **(15 Periods)**

1.1 Measures of Central Tendency: Mean, Median, Mode

1.2 Measures of Dispersion: Mean deviation, Standard deviation

1.3 Co-efficient of rank correlation.

Suggested distribution of marks

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted
1	25	30
2	30	35
3	10	15
4	15	20
Total	**80**	**100**

Reference Book/Text Book

1. Higher Algebra By Hall & Knight
2. Plane Trignometry By S.L. Loney
3. Engineering Mathematics By Sastry (Phi Learning)
4. Engineering Mathematics By B.S. Grewal (Khanna Publishers)
5. Engineering Mathematics By A.B. Mathur (Khanna Publishers)
6. Applied Mathmatics-I & II, By M.K. Kanyal (Khanna Publishers, New Delhi)
7. Applied Mathematics-I, By Dr A.K. Sinha, Satyaprakashan, New Delhi
8. Engineering Mathematics, By C.B. Gupta, S.R. Singh, Mukesh Kumar, Mc Graw Hill Education.
9. Applied Mathematics By R.D. Sharma, Dhanpat Rai Publications, New Delhi
10. Engineering Mathematics, Vol-I & II, By S.S. Sabrwal And Sunita Jain, Eagle Prakashan, Jalandher
11. Basic Engineering Mathematics, By Jhon Bird, Newnes Publications.
12. A Text Book Of Engineering Mathematics, By A. Ganesh, G. Balasubramnium.
13. Polytechnic Mathematics, By Dr. D.S. Prakash, S. Chand, Publications, New Delhi.
14. A Text Book Of Engineering Mathematics, By N.P. Bali & Dr. Manish Goyal, Kindly Publication.
15. Engineering Mathematics, By C.B. Guta, S.R. Singh & Mukesh Kumar, Mc Graw-Hill Publications, Delhi
16. Applied Mathematics, By Kapoor, Nav Distributor, Meerut.

APPLIED PHYSICS – II

L	T	P
3	1	2

Subject Code : 992003

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-I Structure of atom and Origin of Spectra (Qualitative only) (08 Periods)

1.1 Thomson's Model of atom, Rutherford's Model, Bohr's Model

1.2 Energy - levels of atom - concept of energy levels, ionizations and excitation potentials, Energy Band

1.3 Spectrum- Emission Spectrum & Absorption Spectrum Line Spectrum and Band Spectrum

1.4 Optics: Review of basic optics laws: reflection and refraction

1.5 Refraction and refractive index, total internal Reflection and their applications

UNIT-II Electrostatics (13 Periods)

2.1 Coulomb's law, unit of charge, electric potential and electric potential difference

2.2 Electric field, electric field intensity, electric lines of force, electric flux and Gauss's Law

2.3 Applications of Gauss law in finding electric field of point charge, straight charged conductor, plane charged sheet and between two plane parallel charged sheets

2.4 Capacitance: types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors, Dielectric and its effect on capacitance, and dielectric break down

2.5 Application of electrostatics in electrostatic precipitator

UNIT-III Electricity (12 Periods)

3.1 Concept of electricity, current and its unit, direct and alternating current, voltage, resistance and resistivity, potential difference and e.m.f.

3.2 Ohm's law and its applications, concept of resistance, conductance, specific resistance, effect of temperature on resistance, temperature co-efficient of resistance, series and parallel combination of resistors. Introduction to super conductivity.

3.3 Kirchhoff's laws, Wheatstone bridge principle and its applications (Slide Wire Bridge)

3.4 Heating effect of current and concept of electric power, energy and their units, related numerical problems.

UNIT- IV Electromagnetism (13 Periods)

4.1 Magnetic field and its unit, magnetic intensity, magnetic lines of force, magnetic flux and their units, Right hand thumb rule, magnetic lines of force due to straight conductor, circular coil and solenoid

4.2 Force on a charge moving in a uniform magnetic field (Lorentz force). Force on a current carrying straight conductor. Torque on a current carrying rectangular coil. Force between two infinite parallel current carrying conductor.

4.3 Moving coil galvanometer; its principle, construction and working, conversion of a galvanometer into ammeter and voltmeter.

4.4 Electromagnetic induction; Faradays Laws, Lenz's Law. Self and Mutual Induction,. Eddy current

UNIT-V Semiconductor physics (08 Periods)

5.1 Energy bands, intrinsic and extrinsic semiconductors, p-n junction diode and its characteristics

5.2 Diode as rectifier – half wave and full wave rectifier. Transistor: pnp and npn (concept only). Types of Diodes

UNIT-VI Modern Physics (10 Periods)

6.1 Electromagnetic spectrum, photo electric effect and work function, X rays-properties, Applications of X- rays in medicine and industries.

6.2 Lasers: spontaneous and stimulated emission; lasers and its characteristics, population inversion, types of lasers and its engineering and medical applications.

6.3 Fiber optics: introduction to optical fiber materials, types, light propagation and applications in Communication and Medical.

LIST OF PRACTICALS (To perform minimum Six experiments)

1. Conversion of Galvanometer into an Ammeter of given range.
2. Conversion of Galvanometer into Voltmeter of given range.
3. To verify ohm's laws by drawing a graph between voltage and current.
4. To verify laws of resistances in series and in parallel combinations.
5. To draw characteristics of a pn junction diode and find resistance of diode

6. Verification of Kirchhoff's Laws
7. Determination of resistivity by Meter bridge
8. To assemble the components of a given electrical circuit.
9. To identify a Diode, LED, transistor, Resistor, Capacitor from mixed collection of such items and draw their notation.
10. Use of Multi meter to :
    (i) To measure value of given resistance.
    (ii) Distinguish between n-p-n and p-n-p transistors.
    (iii) See the unidirectional flow of a current in case of a Diode and LED

INSTRUCTIONAL STATREGY

Teacher may use various instructional media like models, charts and graphs while imparting instructions. The field application should be made clear before teaching the basics of waves, sound, light, electrostatics, dc circuits, electromagnetism, and semiconductor physics etc to develop proper understanding of the physical phenomenon. Use of demonstration can make the subject interesting and develop scientific temper in the students.

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	08	15
2	13	20
3	12	20
4	13	20
5	08	10
6	10	15
TOTAL	**64**	**100**

Reference/Text Book

1. Applied Physcis By Arthur Beiser (Mcgraw Hill Education, New Delhi)
2. Physics By Resnick & Halliday (Wiley India, New Delhi)
3. Engineering Physics By Gaur & Gupta(Dhantpat Rai, New Delhi)
4. Engineering Physics By Marikani (Phi Learning New Delhi)
5. Engineering Physics, By S.K. Malik, A.K. Singh, Mc Graw Hill Education.
6. Text Book Of Physics For Class XI (Part-I, Part-II) N.C.E.R.T
7. Text Book Of Physics For Class XII (Part-I, Part-II) N.C.E.R.T
8. Applied Physics Vol. I And Vol. II, Ttti Publications, Tata Mcgraw Hill, New Delhi.

9. Concepts In Physics By H.C. Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi.
10. Berkeley Physics Course, Vol. I, II &III, Tata Mcgraw Hill, Delhi
11. Comprehensive Practical Physics, Vol. I & II, J.N. Jaiswal, Laxmi Publishers
12. Engineering Physics By P.V. Naik, Pearson Education Pvt. Ltd, New Delhi
13. Applied Physics I & II By R.A. Banwait & R Dogra, Eagle Parkashan, Jalandhar
14. Applied Physics By Jasmer Kaur And Bhupinder Singh, Lords Publications, Jalandhar
15. Applied Physics -1 By Dr. Prajapati Palariya (Khanna Publishers, New Delhi)
16. Engineering Physics By Vanchna Singh And Sheeetal Kumar, Cengage Learning india Pvt. Ltd. Patparganj, Delhi
17. Applied Physics, By Ramakant, Nav Distributor, Meerut.

APPLIED CHEMISTRY-II

L	T	P
3	1	2

Subject Code : 992004

RATIONALE

The role of Chemistry and chemical products in every branch of engineering is expanding greatly. Now a days various products of chemical industries are playing important role in the field of engineering with increasing number of such products each successive years. The strength of materials, the chemical composition of substances, their behaviour when subjected to different treatment and environment, and the laws of heat and dynamic energy have entered in almost every activity of modern life. Chemistry is considered as one of the core subjects for diploma students in engineering and technology for developing in them scientific temper and appreciation of chemical properties of materials, which they have to handle in their professional career. Effort should be made to teach this subject through demonstration and with the active involvement of students.

DETAILED CONTENTS

1. Metallurgy (12 Periods)

1.1 Introduction of Metallurgy, mineral, ore, gangue or matrix, flux and slag, Concentration methods of the ores. roasting, calcination, smellting and refining as applied in relation to various metallurgical operations

1.2 Metallurgy of (i) Aluminum (ii) Iron

1.3 Definition of an alloy, purposes of alloying, composition and uses of alloys like magnalium, duralumin, alnico, invar and stainless steel.

2. Fuels and combustion (16 Periods)

2.1 Introduction of 'Fuel', characteristics of a good fuel and classification of fuels with suitable examples

2.2 Definition of Calorific value of a fuel and its determination for a solid fuel with the help of Bomb calorimeter with simple numerical problems.

2.3 Manufacture, composition, properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas (iv) Compressed Natural gas (CNG)

2.4 Octane Number ,Cetane Number and Power alcohol

2.5 Nuclear Fuel-Fission and fusion.

3 Corrosion and its Preventions (08Periods)

3.1 Meaning of the term 'corrosion' and its definition

3.2 Theories of corrosion (i) direct chemical action theory and (ii) electro chemical theory

3.3 Prevention of corrosion by

(a) Alloying

(b) Providing metallic coatings

(c) Sacrificial cathodic protections

4 Lubricants (08 Periods)

4.1 Definition of (i) lubricant (ii) lubrication

4.2 Classification of lubricants.

4.3 Principles of lubrication

(i) fluid film lubrication.

(ii) boundary lubrication.

4.4 Properties of lubricants

4.5 Importance of additives in lubricants

4.6 Dewaxing and solvent refining of liquid lubricants

5. Silicate Technology (04 Periods)

5.1 General introduction to cement, varites of cements raw materials of cements.

5.2 Manufacture of Cement (i) Wet Process (ii) Dry Process. Setting and Hardening of cements.

5.3 Defination of Glass, Different varity of glass, raw material, Manufacture of glass.

6. Classification and Nomenclature of Organic Compounds (16 Periods)

6.1 Classification of Organic Compounds, functional group, Homologus Series, difference between organic and inorganic compound.

6.2 Physical and Chemical properties and industrial use of Organic Compound

6.3 IUPAC system of nomenclature of Carboxylic acid, Alcohols, Phenols, Aldehydes, Ketones and Amines (first five members of each series only).

7. Chemistry of engineering material (08 Periods)

7.1 Introduction and Definition of Polymers.

7.2 Plastics-

7.2.1 Classification and constituent, Type of polymerization Thermoplastic and Thermosetting polymer .

7.2.2 Preparation Properties and uses of polyethylene, Bakelite. terylene, PVC, Teflon, Urea, Formaldehyde and Nylon.

7.3 Rubber -

7.3.1. Natural Rubber and vulcanization of rubber, Synthetic Rubber, Buna-N, Buna-S, Butyl and Neoprene.

LIST OF PRACTICALS

1. Gravimetric analysis and study of apparatus used there in.
2. To determine the percentage composition of a mixture consisting of a volatile and a non-volatile substances.
3. Estimate the amount of moisture in the given sample of coal.
4. Esterification and ceric ammonium tests of alcohol.
5. Sodium carbonate and Ester test of carboxylic acids
6. To determination the amount of copper in the given sample of copper sulphate with the help of N/20 sodium thiosulphate solution.
7. Detection of metal iron in the rust (solution of rust in concentrated HCR may be given)
8. Demonstration to determine calorific value of a solid fuel with the help of Bomb Calorimeter.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	08	10
2	12	20
3	08	20
4	08	20
5	04	10
6	16	10
7	08	10
Total	**64**	**100**

Reference Book/Text Book

1. Engineering Chemistry By Jain & Jain (Dhanpat Rai, Delhi)
2. Engineering Chemistry By S Sdara (S. Chand, New Delhi)
3. Engineering Chemistry By Kushal Quanongo (Phi Learning New Delhi)
4. Engineering Chemistry By O.P. Agarwal (Khanna Publishers, New Delhi)

5. Chemistry In Engineering By J.C. Kuriacose And J. Rajaram; Tata Mcgraw-Hill Publishing Company Limited, New Delhi
6. Engineering Chemistry By Dr. S. Rabindra And Prof. B.K. Mishra; Kumar And Kumar Publishers (P) Ltd. Bangalore-4
7. A Text Book Of Applied Chemistry-I By Ss Kumar; Tata Mcgraw Hill, Delhi
8. A Text Book Of Applied Chemistry-I By Sharma And Others; Technical Bureau Of India, Jalandhar
9. Applied Chemistry-I By Dr Indu Singh (Book World Dehradun)
10. Engineering Chemistry By Jain Pc And Jain M,
11. Chemistry Of Engineering By Aggarwal CV,
12. Chemistry For Environmental Engineers By Swayer And Mccarty, Mcgraw Hill, Delhi
13. Progressive Applied Chemistry –I And II By Dr. G.H. Hugar; Eagle Prakashan, Jalandhar
14. Chemistry In Engineering By J.C. Kuriacose And J. Rajaram, Tata Mc Graw-Hill Publication, Company Ltd, New Dehli.
15. Applied Chemistry, By Manju Bansal, Nav Distributor, Meerut.

ENVIRONMENTAL SCIENCE AND ENERGY MANAGEMENT

L	T	P
3	-	-

Subject Code : 992005

RATIONALE

The importance of environment science cannot be disputed. The need for sustainable development is a key to the future of mankind. A diploma holder must have knowledge of different types of pollution caused due to industries, constructional activities and agricultural inputs so that he may help in balancing the ecosystem and controlling pollution by pollution control measures. He should also be aware of various social issues on environment and environment laws related to the control of pollution.

One of the reasons for India not been able to catch up with the desired extent of modernization of industrial processes in light of challenges posed by multinationals is the non-availability of required energy supply. The solution primarily lies in tapping all possible energy generation sources and efficient use of available energy important. Energy management focuses on these aspects. This course will develop awareness amongst the diploma engineers and will enable them to practice the energy management techniques in whatever field they are engaged in.

DETAILED CONTENTS

Unit : 1 Environment, Ecosystem and Natural Resources. (11 Periods)

- Definition of Environment.
- Scope of Environment.
- Effects of Environment on human life.
- Concept of ecosystem.
- Components of ecosystem.
- Structure of ecosystem.
- Function of ecosystem.
- Aspects, Methods, objectives and principle of sustainable Development.
- Water and forest resources.

Unite: 2 Environmental Pollution, Social issues and the Environment.

(12 Periods)

- Air pollution
- Water Pollution
- Soil Pollution

- Marine pollution
- Noise pollution
- Thermal pollution
- Solid waste Mangement : Nature of wastes, Disposal methods, waste-to-energy, Industrial waste.
- Role of an individual in prevention of pollution.

Unit :3 Social Issues and Environment (10 Periods)

- Water conservation, rain water harvesting, water shed management.
- Climate change, global warming, acid rain, ozone layer depletion.
- Disaster management.
- Green Building Technology
- Environment Protection Act.
- Air (prevention and control of pollution) Act.
- Water (prevention and control of pollution) Act.
- Role of Organic farming, bio-fertilizers and bio-pesticides in environment protection.

Unit : 4 Energy Conservation efficiency and energy Audit (10 Periods)

- Energy Conservation and objectives.
- Energy efficiency.
- Energy Conservation in lighting arrangement and appliance used is domestic sector.
- Needs for energy efficient decries.
- Energy efficient motors.
- How to maximize the efficiency of equipments.
- CFL and LED lamps.
- Needs of energy audit.
- Energy Audit methodology.
- About bureau of Energy efficiency and its scheme.

Unit : 5 Renewable Energy (5 Periods)

- Introduction.
- Types of Renewable Energy source.
- Electric vehicle

Recommended Books :

- Fundamental concept in Environmental Studies, D D Mishra, S Chand & Co Ltd.

- Environmental Science by Deswal and Deswal, DhanpatRai and Sons Ltd.
- Handbook of Organic farming by P.D. Gera, Abhishek Publications, New Delhi.
- Environmental studies by Daniel, Wiley India.M Ajni Reddy, Text book of Environmental Science, BS Publication, Hyderabad.
- Manual on Energy Efficiency at Design Stage, CII Energy Management Cell
- Manual on Energy Efficiency in Pumping System, CII Energy Management Cell
- Mannual on Variable Speed Drives for Energy Efficiency CII Energy Managment Cell
- Energy Conservation-case studies in ceramic industry, sugar industry, fertilizer industry, cement industry, CII, Energy Management Cell etc.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period Allotted for Lectures (Periods)	Marks Allotted (%)
1	11	20
2	12	25
3	10	20
4	10	25
5	5	10
Total	**48**	**100**

Recommended Books :

1. Fundamental Concept In Environmental Studies, D.D. Mishra, S. Chand & Co Ltd.
2. Environmental Science By Deswal And Deswal, Dhanpatrai And Sons Ltd.
3. Handbook Of Organic Farming By P.D. Gera, Abhishek Publications, New Delhi.
4. Environmental Studies By Daniel, Wiley India.
5. M. Ajni Reddy, Text Book Of Environmental Science, B.S. Publication, Hyderabad.
6. Manual On Energy Efficiency At Design Stage, CII Energy Management Cell
7. Manual On Energy Efficiency In Pumping System, CII Energy Management Cell
8. Mannual On Variable Speed Drives For Energy Efficiency CII Energy Management Cell Energy Conservation-Case Studies In Ceramic Industry, Sugar Industry, Fertilizer Industry, Cement Industry, CII, Energy Management Cell Etc.

ENGINEERING GRAPHICS- II

L	T	P
8	-	-

Subject Code : 992006

RATIONALE

Engineering Graphics is said to be the language of engineers and technicians. Reading and interpreting Engineering Graphics 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 graphics, their reading and interpretation.

Note: 1. First angle projection is to be followed
2. Minimum of 15 sheets to be prepared by each student.
3. SP 46 – 1988 should be followed.
4. Instructions relevant to various drawings may be given along with Appropriate demonstration, before assigning drawing practice to the Students.

DETAILED CONTENTS

Unit 1 Introduction to Section of Solids – **(12 Periods)**

Why is sectioning necessary, Hatching –BIS Conventions, Section of Prisms and Cubes, Section of Pyramids and Tetrahedrons, Section of Cylinders, Section of Cones, Section of Spheres, Section of Combinations of Solids and Section of Truncated or Frustum Solid, Sectional views & Conventions of Materials and Steel Sections(03 sheets)

Unit 2 Development of Surfaces – **(12 Periods)**

Method of development of Lateral surface, Development of Cubes, Development of Prism and Cylinder, Development of Truncated Prism and Cylinders, Development of Pyramids and Cones, Development of Frustum or Truncated Pyramids and Cones and their Application Such as Tray, Funnel, Chimney, Pipe Bends etc. (03sheets)

Unit 3Threads (03 sheets) **(12 Periods)**

Nomenclature of threads, Types of threads, Forms of various external thread, Sections such as V, Square and Acme threads, BA, BSW and Knuckle, Metric, Seller Thread, Buttress Threads, Simplified conventions of left hand and right hand threads, both external and internal threads, Single start, double start and multiple start threads

Unit 4- Nuts and Bolts (03 sheets) **(09 Periods)**

Different views of hexagonal and square nuts; Assembly of hexagonal headed, square headed, square headed with square neck, bolts with hexagonal and square nuts and washers. Locking Devices -Lock nut, castle nut, split pin nut, sawn nut, slotted nut

Unit 5 - Screws, Studs and Washers (02 sheet) (09 Periods)

Drawing various types of machine screws, Drawing various types of studs and set screws, drawing various type of wooden screws

Unit 6 - Keys and Cotters (03 sheets) (12 Periods)

Various types of keys and cotters and their practical application and Preparation of drawing of various keys and cotters showing keys and Cotters in position, Cotter joints (i) Gib and Cotter Joint (ii) Knuckle Joint

Unit -7 Free hand sketching (03 sheets) (15 Periods)

Rivets and Riveted Joints , Types of structural and general purposes rivet heads, Caulking and fullering of riveted joints, Types of riveted joints – lap, butt (single riveted, double riveted lap joint, single cover plate and double cover plate), chain and zig – zag riveting, Muff or Box coupling, half lap muff coupling

Unit -8 QCAD Window (for Practical's and viva only) (15 Periods)

Drawing Lines- Point Line, Point Line Extended, Line From an Angle, Horizontal Line, Vertical Line, 2-Point Rectangle, Rectangle with Dimensions, Angle Bisector, Parallel Line , with Distance, Parallel Line thru a Point, Line Tangent to Point and Circle or Arc, Line Tangent to 2-Circles or Arcs, Line from Relative Angle, Orthogonal Line, Polygon Centre and Point, Polygon 2-Points.Modify Tools- Move Tool, Rotate Tool, Scale Tool, Mirror Tool, Move and Rotate Tool, Rotate Tool, Trim Tool, Trim Both Tool, Lengthen and Shorten Tool, Stretch Tool, Clip to Rectangle Tool. Text Tools- Text Size and Layers, Text Tool Window, Complex Text in Dimensions, Edit Text with Property Editor.

Block- Insert Block, Modify Block Insertion Parameters, Replicate Block in Drawing with, Modify Tool, Block Configure Menu, Where is Block Stored, Create and Edit a Block Create Empty Block.

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Period Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	12	12
2	12	12
3	12	12
4	9	10
5	9	10
6	12	12
7	15	16
8	15	16
Total	**96**	**100**

Reference/Text Book

1. Engineering Drawing By N.D. Bhatt (Charotar Pub House, Anand (Guj)
2. Engineering Drawing And Graphics+ Autocad By Venugopal (New Age Publication, Delhi)
3. Engineering Drawing By R.K. Dhawan (S. Chand Co.)
4. Engineering Drawing By C.M. Verma, Takniki parkashak, Roorkee.
5. A Text Book Of Engineering Drawing By Surjit Singh; Dhanpat Rai And Co., Delhi
6. Engineering Graphics – I By Vivek Goel (Book World, Dehradun)
7. Engineering Drawing By P.S. Gill; S.K Kataria And Sons, Delhi
8. Engineering Drawing By R.B. Gupta; Satya Prakashan, New Delhi.
9. Engineering Drawing, Ansul- S. Agarwal, Nav Distributor, Meerut.
10. Text book Of Engineering Drawing, By Prof. P.J. Shah, S. Chand Publications, New Delhi.

GENERAL WORKSHOP PRACTICE – II

L	T	P
-	-	8

Subject Code : 992007

RATIONALE

The student will able to know basic workshop processes. Read and interpret job drawings. Identify, select and use various marking, measuring, holding, striking cutting tools & equipments in different shops. Operate, control different machines and equipments. Select proper welding rods and fluxes. Produce jobs as per specified dimensions. Adopt safety practices while working on various machines.

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.

COURSE CONTENT

1. SHEET METAL SHOP (30 Periods)

1.1 Layout of Shop

1.2 Sketch & Label Details of shop lay out.

1.3 Know the different jobs produced in sheet metal shop e.g. Open tray, cylinder, prism, Funnel etc.

1.4 Commonly used raw materials: -M.S. sheet (black), G.I. sheet, M.S. Rivets, and aluminum rivet etc.

1.5 Understand foil, sheet and plate.

1.6 Tools used:-Different snips, shears, stacks, latter punch, figure punch, Solid punch, hollow punch, mallet, soft hammers, channel, Square bars, std. Sheet gauge.

1.7 Types of Joints and Operations- Introduction of various sheet metal operations & joints e.g. seaming, single seam, double seam, Grooved seam, corner joint, cap joint etc.

1.8 Preparation of job (any two): - Open tray, cylinder, prism, Funnel etc.

1.9 Choose correct shape &size of sheet for a given job drawing considering allowances for joint or seam.

1.10 Do marking as per drawing using correct method, tools and sequence.

1.11 Identify correct operation e.g. shearing, punching, bending, debarring, folding, strengthening, stamping, riveting, etc.

1.12 Select appropriate Tool , inspection & measuring Instruments.

1.13 Holding the job in correct position.

1.14 Perform the operation with appropriate body posture, method & precision, exercising personal Judgment of need of the force.

1.15 Inspect for proper joint quality and take remedial steps.

2. WELDING SHOP (30 Periods)

2.1 Layout of Shop

2.2 Sketch & Label Details of shop Layout

2.3 Types of welding

2.4 Type of jobs produced in Welding shop e.g. Lap joint, single butt, double butt, corner, T joint, etc

2.5 Tools & equipments used:-Specifications & use of various tools and equipments used in Welding shop e.g. . A.C. welding transformer, Gas welding set, electrode used, chipping hammer, wire brush, shield, gloves, apron etc

2.6 Preparation of job: - Lap joint, single butt, double butt, corner, T joint, etc.

2.7 Safety measures:- Know the safety regulation in Welding shop.

3. BLACK SMITHY SHOP (25 Periods)

3.1 Understand the function of black smithy & forging shop

3.2 Layout of Shop

3.3 Sketch & Label Details of shop layout

3.4 Know the different jobs produced in smithy shop e.g. round to hexagonal shapes or vice versa J -hook, S- hook, circle, chain etc

3.5 Commonly used raw materials: - M.S. Bars of different shapes and size

3.6 Smithy Tools: - Know various smithy tools with their specifications e.g. different type of hammers, hot / cold chisel, flatters, tongs, leg vice, swage, block, anvils, open hearth and furnaces etc

3.7 Preparation of job : J-hook, S-hook, chain, circle, tong, chisel etc.

3.8 Safety measures: Know the safety regulation in black smithy shop

4. ELECTRONIC SHOP (25 Periods)

4.1 Identification and familiarization with the following tools used in electronic shop: Such as Tweezers, Screw drivers (different sizes), Insulated Pliers, Cutter, Sniper, Philips Screw Driver (Star Screw Driver), L- Keys, Soldering Iron, soldering wire, flux . Their demonstration and uses.

4.2 Identification and familiarization with Multimeter (analog and digital)

4.3 Identification and familiarization with ear phone speaker connector, telephone jacks and similar male and female connectors (audio, video)

4.4 Identification and familiarization with soldering and desoldering practice

4.5 Introduction to thimbles and crimping tools

4.6 Cut, strip, join an insulated wire with the help of soldering iron with different types of wires

5. PLASTIC MOULDING (18 Periods)

5.1 Know the commonly used plastic materials i.e. Thermosetting, Thermo plastic.

5.2 Sketch & label various parts of bench moulding m/c

5.3 Production of any product on bench moulding m/c

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period Allotted (Hrs)	Marks Allotted (%)
1	30	30
2	30	30
3	25	20
4	25	10
5	18	10
Total	**128**	**100**

Reference / Text book

1. Workshop Technology By R.S. Khurmi (S. Chandpublsihers)
2. Workshop Technology By Hajra Chaudhry Part 1 & 2 (Media Promoter, Mumbai)
3. Workshop Technology By T.L. Choudhary (Khanna Publishers, New Delhi)
4. Workshop Technology By Raghuvanshi Part 1 & 2 (Dhanpat Rai & Co.,)
5. Workshop Technology I, II, III, By S.K. Hajra, Choudhary And A.K. Chaoudhary. Media Promoters And Publishers Pvt. Ltd., Bombay
6. Workshop Technology By Manchanda Vol. I, II, III India Publishing House, Jalandhar.
7. Manual On Workshop Practice By K. Venkata Reddy, K.L. Narayana Et Al; Macmillan India Ltd. New Delhi
8. Basic Workshop Practice Manual By T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
9. Workshop Technology By B.S. Raghuwanshi, Dhanpat Rai And Co., New Delhi
10. Workshop Technology By H.S. Bawa, Tata Mcgraw Hill Publishers, New Delhi.
11. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

7. Basic Workshop Practice Manual By T. Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
8. Workshop Technology By B.S. Raghuwanshi, Dhanpat Rai And Co., New Delhi
9. Workshop Technology By H.S. Bawa, Tata Mcgraw Hill Publishers, New Delhi.

IMPLEMENTATION

LEARNING OUTCOMES

ASSESSMENT

IMPACT

LEARNING OUT COMES

Engineering - 1ST Year

Sr.	Title of Subject/Unit	Learning Outcomes to be	Means of Assessment
1	English and Communication	Communicate effectively in English with others.	Assignments and quiz/class tests, mid-term and end-term written tests, model/prototype making Actual laboratory and practical work, model/prototype making, assembly and disassembly exercises and viva-voce Report writing, presentation and viva-Voce.
2	Applied Mathmatics	Apply basic principals of mathematics to solve engineering problems.	Assignments and quiz/class tests, mid- term and end-term written tests, model/prototype making.
3	Applied Physics	Apply basic principles of science to solve engineering problems.	Assignments and quiz/class tests, mid- term and end-term written tests, model/prototype making Actual laboratory and practical work, model/prototype making, assembly and disassembly exercises and viva-voce
4	Applied Chemistry	Apply basic principles of science to solve engineering problems.	Assignments and quiz/class tests, mid- term and end-term written tests, model/prototype making Actual laboratory and practical work, model/prototype making, assembly and disassembly exercises and viva-voce
5	Computer Fundamentals	Use computer and IT tools for creating document, making spread sheet and making presentation.	Assignments and quiz/class tests, mid- term and end-term written tests, model/prototype making Actual laboratory and practical work, model/prototype making, assembly and disassembly exercises and viva-voce Software installation, operation, development and viva-voce
6	Engineering Graphics	Prepare and interpret drawing of components.	Design and drawing.
7	General Workshop Practice	Use cutting tools, equipment and tooling for fabrication of jobs by following safe practices at the workplace.	Assignments and analysis of various job made by students.
8	Environmental Science & Energy Management	Use appropriate procedures for energy conservation and preventing environmental pollutions.	Assignments and quiz/class tests, mid-term and end-term written tests, model/ prototype making