

COMMUNICATION SKILL –I

L T P
2 0 2

Curri. Ref. No.: G101

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

Lecture: 30

Tutorial: 0

Practical: 30

Credit : 3

Theory:

End Exam : 70

P.A.: 30

Practical:

P.A. : 25

RATIONALE

English is not our mother tongue, nor do most of us live in an atmosphere of English. In schools you read English as a *subject* and the main reason behind your reading, for many of you, was simply to pass the examinations.

Now, in the job-oriented education, learners need to learn English not as a subject but as a *service language*- serving as a vehicle for his/her educational as well as professional needs. These are needs for communication. They need to write reports, read instructions and manuals for setting up a machine perfectly and speak to clients for more orders.

So this subject will help to develop reading skills, listening skills, speaking skills and writing skills while using appropriate grammar in reading, writing and speaking. It will enable the learner to use them more confidently in their communicative activities. Learners will be able to read by themselves text and reference books, articles, different government orders, various letters, non-text materials like charts, diagrams, brochures, technical reports and other writings which not only claim factual comprehension but demand higher levels of comprehension involving inference and evaluation etc. It will enable learners to listen, understand and respond appropriately.

DETAIL COURSE CONTENT

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
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THEORY :

1.0 COMMUNICATION **3**

- 1.1 Communication and Communications
- 1.2 Features of Communication
- 1.3 Essential Components of Communication
- 1.4 Barriers of Communication
- 1.5 Types of Communication
- 1.6 Essential Elements of Effective Communication

2.0 READING AND REMEDIAL GRAMMAR USAGE **4**

- 2.1 Developing Reading Skills
- 2.2 Skimming, Scanning, Reading for information structure
- 2.3 Remedial Grammar
 - Time and Tense, Transformation of Sentences
 - Relative Clauses
 - Language Function: Reporting, Suggesting, Agreeing, Defining, Purpose, Instruction, Prohibition

3.0 PREPARATION FOR WRITING **3**

- 3.1 Understanding the writing assignment: topic, purpose, reader, scope and constraints
- 3.2 Analyzing the content
- 3.3 Determining the scope of topic
- 3.4 Audience analysis for entry behavior
- 3.5 Collecting information for the assignment

4.0	WRITING PARAGRAPHS	5
4.1	Identifying Paragraphs	
4.2	Essentials of effective coherent paragraphs	
4.3	Use of appropriate linkers in paragraphs	
4.4	Developing notes into a paragraph	
4.5	Identifying and Writing Topic Sentences and Supporting Sentences	
4.6	Recognising different types of paragraph organisation	
4.7	Use of appropriate tenses, voices and linkers in paragraphs	
4.8	Writing different types of paragraphs	
	<ul style="list-style-type: none"> • Process description • Comparison and contrast • Cause and Effect • Problem Solution 	
5.0	COMPREHENSION OF TECHNICAL TEXTS _ MANUALS, INSTRUCTIONS ETC.	3
5.1	Recognising important information in written texts	
5.2	Note taking with the use of abbreviations, charts, diagrams and Symbols	
5.3	Interpreting with visuals and illustrating with visuals like tables, charts and graphs	
6.0	LISTENING	3
6.1	Importance of Active Listening	
6.2	Functions of Active Listening	
6.3	Techniques for ensuring Active Listening	
7.0	PUBLIC SPEAKING	4
7.1	Planning for the speech	
7.2	Designing the speech	
7.3	Deliver the speech	
7.4	Evaluate the speech	

8.0	Presentation	5
8.1	Rationale of Presentation	
8.2	Types of Presentation	
8.3	Planning of Presentation	
8.4	Guidelines for use of visual aids	
8.5	Practice of Presentation on relevant topics	

SUGGESTED LEARNING RESOURCES:

Reference Books :

1. English for Specific Purposes : A learning – Centred approach
2. Hutchinson, Tom and Waters, A lan, CUP 1987
3. The Second Language Curriculum
— Ed. Robert Keith Johnson, CUP 1989
4. Designing Tasks for the Communicative Classroom
— David Nunan, CUP 1989
5. Writing English Language Tests
— J. B. Heaton Longman Group, U K Limited 1988
6. Writing Matters
— Kristine Brown & Susan Hood, CUP 1989
7. In at the deep end
— Vicki & Hollett, OUP 1989
8. Teaching the Spoken Language,
— G. Brown and G. Yule CUP 1983
9. ENGLISH SKILLS for Technical Students TEACHERS HANDBOOK / West Bengal State Council of Technical Education in collaboration with THE BRITISH COUNCIL / Orient Longman.

MATHEMATICS-I

L T P
4 1 0

Curri. Ref. No.: G103

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

Theory:

Lecture: 60

End Exam : 70

Tutorial: 15

P.A.: 30

Practical: 0

Practical:

Credit : 5

P.A. : 0

RATIONALE

Mathematics is the backbone of all areas of technology and hence, technicians and engineers need study of relevant theories and principles of mathematics to enable them to understand and grasp the concept of advance courses of the curriculum. With the above view in mind, the necessary content details for the course of Mathematics-I are derived. It is presumed that this course content will provide a satisfactory foundation for technical applications, which technicians/engineers supposed to come across in the field of studies.

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
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1.0 ALGEBRA 15L+5T

- 1.1 Arithmetic and Geometric Progressions (A.P. & G.P.)
- 1.2 Formula of the nth term of A.P.
- 1.3 Properties and concept of G.P., the nth term of G.P.
- 1.4 Complex Numbers
 - Definition of a Complex number
 - Polar form of a complex number, Problems
 - Cube roots of unity, Fourth roots of unity, the nth roots of unity
 - Permutation and combination in elementary level with formulae and simple examples.
 - Factorials
 - Quadratic Equation.
 - Properties of quadratic Equation

1.5 Binomial Theorem

- Positive integral index
- Expansion of $(x + a)^n$, where n is a positive integer
- Rules for finding general term & middle term etc.
- Calculation of approximate value, when the number of terms, n is large.
- Properties of Binomial Coefficients

1.6 Sets and Relation

- Relational algebra
- Sets & subsets
- Operations on sets
- Product sets (Cartesian product)
- Concepts of relation, domain and Range
- Sets arising from relations

2.0 TRIGONOMETRY

10L+5T

- 2.1 Trigonometric functions
- 2.2 Trigonometric functions of allied angles
- 2.3 Trigonometric ratios
- 2.4 Half angle, double angle, triple angle – derivation & problems
- 2.5 Compound trigonometric functions
- 2.6 Properties of a Triangle
- 2.7 Solution of triangle using the properties
- 2.8 Trigonometric ratios with angles $A \pm B$ and $C \pm D$
- 2.9 Definition of periodic function and the period of trigonometric function.
- 2.10 Interpret the graphs of: $a \sin(b\theta + c)$, $a \cos(b\theta + c)$
- 2.11 Use multiple and sub-multiple angle formulae to simplify trigonometric expressions.

3.0 STATISTICS

10L+3T

- 3.1 Data frequency distribution, tabulations and representation.
- 3.2 Continuous and discontinuous variables
- 3.3 Frequency- relative and commutative relative
- 3.4 Graphical representation of frequency.
- 3.5 Bar chart, Histogram and frequency polygon
- 3.6 Mean, median, mode and relationship.
- 3.7 Harmonic mean
- 3.8 Range, Deviation, Mean deviation, Standard Deviation
- 3.9 Probability
- 3.10 Event and different mathematical formulae
- 3.11 Probability for independent and dependent events
- 3.12 Problems based on probability
- 3.13 Introduction : Numerical Methods
- 3.14 Concept of difference tables.
- 3.15 Newton's Interpolation methods (Forward and backward)
- 3.16 Lagrange's interpolation method.
- 3.17 Concept of extrapolation.

4.0 MATRICES

10L+2T

- 4.1 Matrix- definition, notations
- 4.2 Element of matrix
- 4.3 Type of matrices
- 4.4 Special Matrices -
Square, diagonal, row, column, scalar Unit, zero or null, upper and lower triangles, Symmetric, skew.
- 4.5 Introduction to determinants
- 4.6 Addition and subtraction of matrices
- 4.7 Product of two matrices
- 4.8 Adjoint of a matrix
- 4.9 Inverse matrix
- 4.10 Solution of a system of linear equations using matrix method.

SUGGESTED LEARNING RESOURCES

Text Books:

1. College Algebra By A.R. Majumder & P.L. Ganguli
2. Plane Trigonometry Part I By S.L. Loney
3. Statistics By N.G. Das
4. Trigonometry By Das & Mukherjee

Reference Books:

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

PHYSICS - I

Curri. Ref. No.: G106

L T P
2 0 2

Total Contact Hrs.: Total Marks: 150

Lecture: 30

Tutorial: 0

Practical: 30

Credit : 3

Theory:

End Exam : 70

P.A.: 30

Practical:

End Exam.: 25

P.A. : 25

RATIONALE

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

- The attainment level of students in Physics at entry level to polytechnics.
- Reference to engineering subjects.
- Continuity of sequence necessary for logical development of the subject

DETAILED COURSE CONTENTS

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 UNITS, DIMENSION AND MEASUREMENTS	2
Units, Dimension	
• Concept of unit of physical parameters	
• Fundamental and derived units	
• SI system of units of different physical parameters	
• Dimension with examples of different physical parameters.	

1.1 Measurements

- Measuring devices e.g., slide callipers, screw gauge, spherometer with concept of vernier constant, least count and zero error.
- Physical Balance

2.0 MECHANICS

4

2.1 Motion along a straight line and Force

- Concept of scalar and vector quantities
- Speed, velocity and linear acceleration
- Equations of motion with constant acceleration (derivation not required)
- Equations of motion of falling body under gravity
- Simple problems on linear motion
- Newton's laws of motion, Action and reaction, tension
- Force, inertia, momentum, impulse and impulsive force with practical examples
- Conservation of linear momentum.

3.0 GRAVITATION

3

- Newton's laws of gravitation
- Newton's gravitational constant G and its SI unit
- Acceleration due to gravity (g) and its relation with "G".
- Variation of g with altitude and latitude (deduction not required)
- Difference between mass and weight
- Simple problems

4.0 WORK, POWER AND ENERGY

3

- Work, power and energy with their units and mathematical expressions
- Relation between Horse power and Watt
- Different forms of mechanical energy : PE, KE and their expressions
- Conservation of energy and transformation of energy with examples
- Simple problems

5.0 PROPERTIES OF MATTER

6

5.1 Properties of solid

- Plasticity and elasticity in solids
- Deformation of bodies by the action of external forces change in size and change in shape
- Unit of stress – tensile stress, compressive stress and Shear stress with examples
- Unit of strain – tensile strain, volumetric strain and shear strain & Hooke's law
- Modulus of elasticity – Young's modulus, Bulk modulus and Modulus of rigidity, Poisson's ratio and their units [Definition & basic concepts only, no deduction]
- Stress – Strain curve

5.2 Properties of Fluid

- Thrust and pressure
- Law of fluid pressure, Pascal's law & working principles of hydraulic press
- Archimedes Principle and its applications
- Specific gravity and relative density
- Hydrometers and their uses
- Properties of gas : Toricelli's Expt. & Simple Barometer
- Simple problems

6.0 HEAT

6

6.1 Heat and temperature (Review)

- Heat and temperature
- Fixed points and different scales of temperature - Fahrenheit, Celsius and Kelvin and their relationships
- Simple problems

6.2 Measurement of heat

- Quantity of heat, units of heat: Joule and Calorie
- Specific heat of solid, heat capacity, water equivalent
- Principle of calorimeter, Measurement of specific heat

- Change of state : Latent heat, evaporation & boiling, effect of pressure
- Boyle's law and Charles law, Universal gas law and universal gas constant.
- Idea of two specific heat capacities of gas: C_p and C_v and their relationships (deduction not required)

6.3 Thermal expansion & Transmission of heat

- Expansion of solid – linear, superficial and cubical co-efficient of expansion & their units
- Interrelationship between different co-efficient of expansion with examples
- Different methods of transmission of heat : conduction, convection and radiation
- Co-efficient of thermal expansion & its unit
- Good conductors and bad conductors of heat
- Simple problems

7.0 SOUND

6

7.1 Simple Harmonic Motion

- Simple harmonic motion and its characteristics
- Time period, frequency & amplitude of vibration
- Mathematical expression of SHM
- Examples of SHM: Simple Pendulum
- Idea on Longitudinal & Transverse wave
- Simple problems

7.2 Production and propagation of Sound

- Natural vibration, forced vibration with examples
- Resonance of sound with examples
- Principle of resonance to find out velocity of sound in air.
- Velocity of sound, Newton's formula and Laplace correction (Idea only, no deduction)

7.3 Reflection of sound

- Echo, reverberation
- Simple problems

7.4 Musical sound, noise

- Characteristics of musical sound and noise with examples
- Factors affecting sound

(Note: 10 L Hrs. can be used for assessment and evaluation of students on each module.)

PRACTICAL:

Suggested list of experiments:

1. To measure the volume of a wooden block by using Vernier callipers.
2. To measure the surface area of a metal washer by Vernier inside callipers
3. To measure the depth of a hole by Depth Gauge (Vernier callipers)
4. To measure the cross-section of a wire by Screw Gauge.
5. To determine the thickness of a glass plate by Spherometer.
6. To adjust a common balance and to determine the specific gravity of a liquid by specific gravity bottle.
7. To establish the relation between pressure and volume of a fixed mass of gas at a constant temperature using Boyle's apparatus.
8. To determine the acceleration due to gravity (g) of a place by simple pendulum.
9. To measure the velocity of sound in air by air resonance column method.

SUGGESTED LEARNING RESOURCES:

REFERENCE BOOK:

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

CHEMISTRY – I

L T P
2 0 2

Curri. Ref. No.: G108

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

Lecture: 30

Tutorial: 0

Practical: 30

Credit : 3

Theory:

End Exam : 70

P.A.: 30

Practical:

End Exam.: 25

P.A. : 25

RATIONALE:

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

Chemistry-I will enable the students to develop fundamental knowledge and skills related to chemical properties of matters in general, such as solid liquid and gas, and their appropriate applications in engineering disciplines which include general chemistry, chemistry of water Electro-chemistry, physical chemistry, organic chemistry and refractories.

DETAILED COURSE CONTENTS

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
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1.0 GENERAL CHEMISTRY

10

1.1 Concept of symbol, valency, formula, atomic mass, molecular mass, elementary idea of atomic structure (Review).

1.2 Solution

1.2.1 Classify and explain solution according to concentration

1.2.2 Distinguish among suspension, colloids and true solution.

1.2.3 Define and explain solubility, effect of temperature on solubility

1.2.4 Mention practical applications of colloids in different situations

1.2.4.1 Colloidal impurities in drinking and sewage water.

1.2.4.2 Finely divided colloidal particles in air causes Air-Pollution.

Assignment and Class Test

1.3 Acid, Base and Salt

1.3.1 Define and classify acid, base and salt (Review)

1.3.2 Define and explain normal solution, molar solution, titration and indicator

1.3.3 Define pH of a solution and pH Scale

1.3.4 Calculate pH from H^+ ion concentration

1.3.5 Mention application of pH in industry such as

1.3.5.1 pH of a boiler feed water

1.3.5.2 Role of pH in sewage treatment

1.3.5.3 pH in Sugar, Paper industry

1.3.5.4 Buffer Solution, types and application.

Assignment and Class test

1.4 Chemical Bonding

1.4.1 Covalent Bond, Ionic Bond, Hydrogen Bond and Metallic Bond

Assignment and Class test

2.0 CHEMISTRY OF WATER

7

2.1 State the different types of impurities present in natural water and name impurities under each of them types.

2.2 Explain how natural water gets contaminated with the impurities.

2.3 Explain the action of soap on water

2.4 Define and explain soft and hard water with illustrations

2.5 Classify and explain hardness of water with illustration

2.6 State different ways of expressing concentration of impurities in water including hardness.

2.7 Name the bad effects caused by natural water when used in domestic as well as industrial purpose.

2.8 State and explain the remedial measures of the following bad effects of natural water in boiler.

- Scales and sludges
- Caustic Embrittlement
- Priming and foaming
- Corrosion

- 2.9 Define boiler feed water
- 2.10 Describe with help of diagram of the following water treatment Process.
- 2.10.1 Lime soda process
- 2.10.2 Permutit or Zeolite process
- 2.11 Describe with the help of block diagram, the treatments done on a sample of raw water to produce drinking water and boiler feed water. Solve problems on a) bad effects on natural water b) water treatment process.

Assignment and Class test

3.0 PHYSICAL CHEMISTRY 3

- 3.1 Catalyst, types, characteristics and application of Catalyst in Industries
- 3.2 Radioactivity-Introduction, Characteristics of alphas, beta and gamma rays, half-life period, artificial fission, atomic fusion, application in different fields.

4.0 METALLURGY AND ALLOYS 6

- 4.1 Types of metals & properties
- 4.2 General Metallurgical process
- 4.3 Metallurgy of iron by blast furnace (principle only)
- 4.4 Classification of Steel based on its carbon content and its application
- 4.5 Properties of cast iron, wrought iron and steel
- 4.6 Effects of adding alloying elements on the properties of steel
- 4.7 Definition of alloy and purpose of alloying
- 4.8 Method of preparation of alloy (brief outline only)
- 4.9 Composition, properties and engineering uses of following alloys:
Duralumin, Magnalium, Brass, Bronze, Monel metal, Babbitts metal, Gun metal and Alnico.

Solve problems, Assignments and class tests.

5.0 Refractories 4

- 5.1 Define refractories
- 5.2 Classification
- 5.3 Properties
- 5.3.1 Refractoriness,
- 5.3.2 Strength
- 5.3.3 Thermal expansion,
- 5.3.4 Porosity
- 5.4 Portland Cement
- 5.4.1 Composition
- 5.4.2 Properties
- 5.4.3 Types.

PRACTICAL:

Suggested list of experiments:

- To titrate using standard acid solution to know the strength of a base using indicator or vice-versa.
- To determine alkalinity of a water sample by titration method.
- To observe action of soap on hard water (only demonstration).
- To determine the total hardness of water sample by complexometric method using EDTA
- To determine the pH of different sample by using pH meter.
- To detect qualitatively the presence of Arsenic/Iron in drinking water by using Arsenic/Iron Kit

SUGGESTED LEARNING RESOURCES:

Text Books:

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

Reference Books:

Intermediate Chemistry by R.K. Samal.

ENGINEERING DRAWING – I

L T P
1 0 3

Curri. Ref. No.: G201

Total Contact Hrs.: Total Marks: 100

Theory:
End Exam : 50

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

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

RATIONALE

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

DETAIL COURSE CONTENTS:

THEORY/PRACTICAL:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.	
1.0 INTRODUCTION TO DRAWING	1+3	4
1.1 Use of different drawing instruments		
1.2 Conventions of Lines		
1.3 Principle of dimensioning system		
1.4 Types and construction of scales Plain and Diagonal scale		
2.0 CURVES AND TANGENTIAL	2+6	8
2.1 Construction of Ellipse by: Arc and Circle method, Concentric Circle method, Rectangle/ Oblong method		

2.2 Construction of Parabola by: Directrix focus method, Rectangle method		
2.3 Draw Hyperbola by: Transverse axis and focus method, Passing through a given point		
2.4 Draw involutes of: A polygon, A circle		
3.0 PROJECTION OF POINTS AND LINES	2+6	8
3.1 Projection of Points in different planes		
3.2 Projection of lines in different plane		
3.3 Lines inclined to one reference plane		
4.0 PROJECTION OF PLANES	3+9	12
4.1 Projection of planes of following shapes: Circular, Rectangular, Pentagonal, Hexagonal		
4.2 Projections for above planes for inclined to one plane		
5.0 PROJECTION OF SOLIDS	3+9	12
5.1 Projection of following solids, inclined to one reference plane: Prism, Cube, Pyramid, Cylinder		
5.2 Projection of above solids when section resting on base and ground		
6.0 INTRODUCTION TO COMPUTER AIDED DRAFTING (CAD)	4+9	13
6.1 Introduction, unit system, coordinate system, layout of sheets, draw commands, edit commands, display commands with simple examples		
7.0 FORMATIVE EVALUATION		3
TOTAL: 15+45		60

SUGGESTED LEARNING RESOURCES

Reference Books and Standards:

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

WORKSHOP PRACTICE – I

L T P

1 0 3

Total Contact Hrs.:

Lecture: 15

Tutorial: 0

Practical: 45

Credit : 3

Total Marks: 150

Curri. Ref. No.: G203

Practical:

End Exam : 50

P.A. : 50

RATIONALE

Workshop practice equips students with basic knowledge of the principles of manufacturing, economic aspects and application of the various equipment, processes and measurement techniques used in Engineering Workshops. In addition to this safety aspects and safe working procedures specially those related to operating machinery and handling equipments will be taught.

DETAIL COURSE CONTENT

THEORY

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 WOOD WORKING SHOP	2
1.1 Introduction to the trade	
1.2 Types of wood and its characteristics	
1.3 Defects in timber and its identification	
1.4 Wood working hand tools	
1.5 Wood working machine tools	
1.6 Wood working processes	
1.7 Joints and joinery processes	
1.8 Varnishing and painting	
1.9 Safety precautions	

2.0	FABRICATION SHOP (WELDING)	2
2.1	Introduction to metal joining	
2.2	Electric arc welding	
2.3	Gas welding	
2.4	Equipment and consumables used in welding	
2.5	Types of welding joints	
2.6	Welding defects	
2.7	Safety precautions in welding	
3.0	FITTING SHOP	2
3.1	Introduction to the equipments and tools of fitting shop	
3.2	Types of files and filing processes	
3.3	Drill bits and drilling process	
3.4	Safety precautions to be observed in fitting shop.	
4.0	SHEET METAL SHOP	2
4.1	Sheet metal hand tools and machines	
4.2	Types of sheets	
4.3	Operations in sheet metal shop: shearing bending, folding,	
4.4	Rolling, swaging, grooving, etc	
4.5	Sheet metal joints: temporary and permanent	
4.6	Soldering: process, equipment, consumables	
4.7	Brazing: process, equipment, consumables	
5.0	MEASUREMENT & INSPECTION	3
5.1	Measurement and its types	
5.2	Instruments used for linear measurement	
5.3	Instruments used for angular measurement	
5.4	Instruments used for measuring weight and mass	
5.5	Instruments used for measuring current, voltage, power and insulation.	
6.0	ERECTION OF MACHINES	2
6.1	Levelling and alignment	
6.2	Assembly of machine	
6.3	Laying of cables	

6.4	Wiring of cables to interface
6.5	Demonstration of erection of machine

7.0	PIPE FITTING	2
7.1	Types of pipe and its application	
7.2	Pipe fitting tools	
7.3	Pipe bending	
7.4	Pipe fitting operations	
7.5	Pipe joints	

SUGGESTED LIST OF EXPERIMENTS/ DEMONSTRATIONS 45

1. Making a lap joint with help of wood working hand tools.
2. Making a Mortise and tennon joint as per drawing.
3. Making a Dovetail joint as per given drawing.
4. Varnishing of finished given job as per instructions
5. Cutting of metal work piece using oxy acetylene gas welding
6. Preparation of butt joint using arc welding on 4mm M.S. plate
7. Preparation of Tee joint on M.S. sheet by arc welding
8. Carryout the following on given Mild Steel job:
 - (a) Prepare and check surface flatness
 - (b) Prepare and check surface perpendicularity.
 - (c) Drill three holes of different diameter as per instructions.
9. One job on fitting joints containing different operation such as hacksaw cutting, filing, slotting and fitting.
10. Soldering of IC on PCB
11. Preparation of sheet metal square box of size 12' and depth 4"
12. Preparation of temporary joint using screw
13. Compare various methods of length and diameter measurement.
14. Measure the area of irregular figure with the help of plannimeter.
15. Measure current and voltage (A.C. and D.C.)
16. Investigation of some errors in electrical measurements.

SUGGESTED LEARNING RESOURCES:

Reference Books:

1. S.K. Hajra Choudhury *Workshop Technology Vol 1 & 2* Media Promoters of Publishers
2. Khanna, O.P. *Workshop Technology* Dhanpat Rai & Sons Publications
3. Chapman *Workshop Technology Parts 1 & 2* 4th Edition, Viva Books P. Ltd., New Delhi
4. Kenyon Pitman *Basic Fabrication & Welding* Pitman Pub. Ltd.
5. P.N.Rao *Manufacturing Technology* Tata Macgraw Hill

INTRODUCTION TO INFORMATION TECHNOLOGY

L T P
2 0 3

Total Contact Hrs.:

Lecture: 30

Tutorial: 0

Practical: 45

Credit : 4

Total Marks: 150

Curri. Ref. No.: G205A

Theory:

End Exam : 50

Practical:

End Exam.: 25

P.A. : 50

RATIONALE

Information Technology is an in-avoidable part now-a-days. The discipline of Engineering is also being highly influenced by the recent development in the field of IT. This course emphasizes of the various components of Information Technology. The course deals with Hardware, Software and Communication technologies in brief that those are the foundation of IT. It therefore becomes important for the students to understand the concept and develop necessary skills in different aspects of information technology.

DETAIL COURSE CONTENT

THEORY

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 Introduction to IT - its components computer, communication & management .	03
2.0 Introduction to Number System, Bits, Bytes, Word, Logical Gates, Truth Table, ASCII, BCD, Floating point and Fixed Point number representation.	06
3.0 Introductory ideas about the components of computer – Hardware - Central Processing Unit, Input Unit, Output Unit, Memory Unit, Auxiliary Unit,	08

Peripherals - Monitor, Keyboard, Mouse, Printer, Hard disk, CD/DVD, USB storage devices, Micro SD Cards, etc. Software and firmware building blocks of a computer, its function and its use. Role of operating system.			
4.0 Classification of software - System Software, Application Software Translator - Compiler, Interpreter, Preprocessor. Operating System - Single User, Multiple User. Windows XP/Vista / 7 / 8 - Definition of Windows, Windows element, Concept of Graphical user Interface, Concept of Icon, Working with File Management, Concept of GUI based software; concept of client & server, concept of www, Internet services, use of standard browsers, basics of HTML and searching.	06	4.	Introduction to Power Point 07 Creating a Presentation, Adding/Editing Text, Working with objects, Formatting the Presentation, Placing the chart in slide, Slide Show and Printing
5.0 Computer communication interface, introductory concepts of networking, Transmission media – Wired and Wireless, use of Modem Concept of LAN, WAN, Internet, Intranet, Email.	07	5.	Internet Browsing and Emailing 05 Internet surfing and browsing, searching content from the Internet using search engines, Email – account opening, composition of e-mails, searching mails, forward and reply of mails
PRACTICAL:			
Suggested demonstration / tasks :			
1. Introduction to MS Office Basic features of Ms Office, Overview of Different Office Tools	01		
2. Introduction to MS Word Creating and Editing document, Formatting Documents, Working with Tables, Spell checking, Mail Merging, Importing Graphics into word Document	08		
3. Introduction to MS Excel Creating a New Work Book, Entering Labels, Values and Formulas, Formatting the layout, Working with Functions, Creating the Chart from data, Writing macros.	09		

INTRODUCTION TO COMPUTER PROGRAMMING

L T P
2 0 3

Curri. Ref. No.: G205B

Total Contact Hrs.: Total Marks: 150

Lecture: 30

Tutorial: 0

Practical: 45

Credit : 4

Theory:

End Exam : 50

Practical:

End Exam.: 25

P.A. : 50

RATIONALE

This course is an introduction to the C-programming language. The student will be introduced to Flowcharts, Algorithm and Pseudo-code. They will also have knowledge of different types of programming language. The student will get acquainted with fundamentals of C Language like the character set, operators and expressions used and the control structure. They will learn to write programs containing the following C language features: simple data type, looping, branching, one-dimensional arrays and user-defined functions. The use of structured programming techniques, program readability, program documentation and testing will be emphasized.

DETAIL COURSE CONTENT

THEORY:

UNIT	TOPIC / SUB-TOPIC	Lecture Hrs.
1.0	INTRODUCTORY CONCEPTS	6
	1.1 Introduction to Computers	
	1.2 Programming techniques	
	1.3 Flowcharts	
	1.4 Algorithm	
	1.5 Pseudo codes	
	1.6 Types of Programming Languages – Machine Level Language, Assembly Level Language, High Level Language, 4Gen. Language	

- 1.7 Introduction to assembler, compilers, case tools
- 1.8 Introduction to C

2.0 C FUNDAMENTALS 2

- 2.1 The 'C' Character Set
- 2.2 Identifiers and Keywords
- 2.3 Data Types
- 2.4 Constants
- 2.5 Variables and Arrays
- 2.6 Declarations
- 2.7 Expressions
- 2.8 Statements
- 2.9 Statements
- 2.10 Symbolic Constants

3.0 OPERATORS AND EXPRESSIONS 2

- 3.1 Arithmetic Operators
- 3.2 Unary operators
- 3.3 Relational and Logical Operators
- 3.4 Assignment Operators
- 3.5 The Conditional Operator
- 3.6 Library Functions

4.0 DATA INPUT AND OUTPUT 2

- 4.1 Preliminaries
- 4.2 Single Character Input- The getchar Function
- 4.3 Single Character Output-The putchar Function
- 4.4 Entering Input data – The scanf function
- 4.5 Writing Output Data – The printf function
- 4.6 gets and puts Function

5.0 PREPARING AND RUNNING A COMPLETE C PROGRAM 2

- 5.1 Planning a C Program
- 5.2 Writing a C Program

5.3	Entering the Program into the Computer	
5.4	Compiling and Executing the Program	
5.5	Error Diagnostics	
5.6	Debugging Techniques	
6.0	CONTROL STATEMENTS	5
6.1	Preliminaries	
6.2	Branching: The if-else statement	
6.3	Looping: while, do-while & for statements	
6.4	Nested Control Structures	
6.5	The switch statement	
6.6	The break statement	
6.7	The continue statement	
6.8	The Comma operator	
6.9	The goto statement	
7.0	ARRAYS	6
7.1	Defining an Array	
7.2	Processing and Array	
7.3	Passing Arrays to Functions	
7.4	Multidimensional Arrays	
7.5	Arrays and Strings	
8.0	USER DEFINED FUNCTIONS	5
8.1	Concepts of a User Defined Function	
8.2	Declaration of Function	
8.3	Function Prototypes/ signatures	
8.4	Function calling	
8.5	Passing Arguments to a Function	
8.6	Recursive functions	

PRACTICAL:

Suggested demonstrations / tasks:

1.0	Introduction
1.1	C language and its compilers
1.2	Keywords, expressions, constant
1.3	Primitive data types in C
1.4	Header files and library functions
1.5	Types of Variable
1.6	Pre-processor directive and Macro
2.0	Using Program Control
2.1	Conditional Statements
2.2	Iterative Statement
2.3	Unconditional jump and its restrictive usage
2.4	Importance of initialisation
3.0	Working with Array
3.1	Overview of array
3.2	One dimensional array
3.3	Multidimensional array
3.4	String representation
3.5	String manipulation
4.0	Creating User defined Function
4.1	Writing functions in C language
4.2	Function definition and function declaration
4.3	Writing void function
4.4	Writing parameter passing and global declaration
4.5	Scope of variables in function
4.6	Recursion: Binary search, quick sort

SUGGESTED LEARNING RESOURCE

Reference Books :

1. Programming in ANSI C – by E. Balagurusamy, TMH
2. C Programming Language, the (ANSI C version) – by Kernighan & Ritchie, PHI
3. Let Us C – by Yashwant Kanitkar, BPB
4. Programming in C – Schaum Series

LIST OF EQUIPMENT

Hardware : Stand alone PC
(for detail, please refer Annex – I)

Software : C Compiler

Sample path for Term-I Civil Engg. ,Mechanical Engg, Electrical Engg. , Electronics and Computer Science and Engg.

Sl. No	Code	Course	Study Scheme			Evaluation Scheme							Total Marks	Credit	
			Pre-requisite	Contact Hours / Week			Theory			Practical					
				L	T	P	End Exam	Progressive Assessment			End Exam	Progressive Assessment			
								Class Test	Assignment	Attendance		Sessional			Viva voce
1	G101	Communication Skill-I	2	0	2	70	15	10	5	-	15	10	125	3	
2	G103	Mathematics-I	4	1	0	70	15	10	5	-	-	-	100	5	
3	G106	Physics - I	2	0	2	70	15	10	5	25	15	10	150	3	
4	G108	Chemistry - I	2	0	2	70	15	10	5	25	15	10	150	3	
5	G201	Engineering Drawing – I	1	0	4	-	-	-	-	25	25	-	50	3	
6	G203	Workshop Practice - I	0	0	4	-	-	-	-	-	25	25	50	2	
7	G205A	Introduction to Information Technology	2	0	3	50	0	0	0	25	50	-	125	4	
8	G205B	Introduction to Computer Programming*	2	0	3	50	0	0	0	25	50	-	125	4	
TOTAL			13	1	20	350	75	50	25	75	175	50	875	26	

* For Electrical Engineering and Computer Science & Engg. Students.