

2.1 ENGLISH AND COMMUNICATION SKILLS - II

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RATIONALE

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

DETAILED CONTENTS

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|-------|---|----------|
| 1. | Facets of Literature | (14 hrs) |
| 0.0 | Short stories | |
| 1.1.1 | The Portrait of a Lady - Khushwant Singh | |
| 0.0.1 | The Doll's House – Katherine Mansfield | |
| 0.0.1 | The Refugees – Pearl S. Buck | |
| 1.2 | Prose | |
| 1.2.1 | Walking Tours – R.L. Stevenson | |
| 1.2.2 | A Dialogue on Civilization – C.E.M. Joad | |
| 1.2.3 | The Sign of Red Cross – Horace Shipp | |
| 3 | Poems | |
| 1.3.1 | All The World's A Stage – W. Shakespeare | |
| 1.3.2 | Say Not, The Struggle Nought Availeth – A.H. Clough | |
| 1.3.3 | Pipa's Song – Robert Browning | |
| 2. | The Art of Précis Writing | (04 hrs) |
| 3. | Grammar and Usage | (08 hrs) |
| 3.1 | Narration | |
| 3.2 | Voice | |
| 3.3 | Idioms and Phrases | |
| 4. | Correspondence | (04 hrs) |
| 3.0 | Business Letters | |
| 3.0 | Personal letters | |

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| 5. | Drafting | (06 hrs) |
| | 5.1 Report Writing | |
| | 5.1 Inspection Notes | |
| | 5.1 Memos, Circulars and Notes | |
| | 5.1 Telegrams | |
| | 5.1 Press Release | |
| | 5.1 Agenda and Minutes of Meetings | |
| | 5.1 Applying for a Job | |
| 6. | Glossary of Technical & Scientific Terms | (04 hrs) |
| 7. | Communication | (08 hrs) |
| | 7.1 Media and Modes of Communication | |
| | 6.1 Channels of Communication | |
| | 6.1 Barriers to Communication | |
| | 6.1 Listening Skills | |
| | 6.1 Body language | |
| | 6.1 Humour in Communication | |

LIST OF PRACTICALS

1. Practice on browsing Information on Internet
1. Group Discussions
1. Mock Interviews
1. Telephone Etiquette-demonstration and practice
1. Situational Conversation with feedback through video recording
1. Presentation on a given theme (using PowerPoint)
1. Exercises leading to personality development like mannerism, etiquettes, body language etc.
1. Reading unseen passages
1. Writing (developing) a paragraph
1. Exercises on writing notices and telephonic messages

Note:

0. The Text Book on "English and Communication Skills, Book-II by Kuldip Jaidka et. al. developed by NITTTTR, Chandigarh is recommended to be used for teaching and setting-up the question papers.
0. A communication laboratory may be set up consisting of appropriate audio-video system with facility of playing CDs/DVDs and a video camera for recording the performance of each student with play back facility. A set of CDs from any language training organization e.g. British Council etc. may be procured for use of students.
0. Elements of body language will be incorporated in all practical exercises.
4. The practical exercises involving writing may also be included in Theory Examination.

RECOMMENDED BOOKS

1. English and Communication Skills, Book-II By Kuldeep Jaidka, Alwinder Dhillon and Parmod Kumar Singla, Prescribed by NITTTTR, Chandigarh & Published By Abhishek Publication, 57-59, Sector-17, Chandigarh
1. Essentials of Business Communication by Pal and Rorualling; Sultan Chand and Sons
1. The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India
1. New Design English Grammar, Reading and Writing Skills by AL Kohli (Course A and course B), Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
1. New Design English Reading and Advanced Writing Skills for Class XI and XII by MK Kohli and AL Kohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
1. A Practical English Grammar by Thomson and Marlinet
1. Spoken English by V Sasikumar and PV Dhamija; Tata McGraw Hill
1. English Conversation Practice by Grount Taylor; Tata McGraw Hill
1. Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi
1. Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi
1. Communication Skills by Ms R Datta Roy and KK Dhir; Vishal Publication, Jalandhar

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Topic No.	Topic	Time Allotted (Hrs)	Marks Allocation
1	Facets of Literature	14	30
2	The Art of Précis Writing	4	10
3	Grammar and its Usage	8	15
4	Correspondence	4	10
5	Drafting	6	15
6	Glossary of Technical & Scientific Terms	4	05
7	Communication	8	15
Total		48	100

2.2 APPLIED MATHEMATICS – II

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RATIONALE

Applied mathematics forms the backbone of engineering studies. In continuation to the basic elements of Differential calculus and integral calculus taught in I paper and their applications, statistics and probability have been included in this course. This course will develop analytical abilities amongst the students and will provide base for continuing education base to the students.

DETAILED CONTENTS

1. Algebra (16 hrs)
 - 1.1 Matrix: Algebra of matrices, inverse, elementary row/column-transformation, linear dependence, rank of matrix, type of matrix, Eigen pairs, Cayley-Hamilton theorem
 - 1.2 Determinants: Elementary properties of determinants of order of 2&3, multiplication system of algebraic equation, consistency of equation, Cramme's rule
 - 1.3 Vector Algebra: Definition of vector and scalar quantities, addition and substration of rectors. Dot and cross product of two vectors. Angle between two vectors, applications of dot and cross product in Engineering problems.

2. Co-ordinate Geometry (16 hrs)
 - 1.0 Point in space. Distance between two points, ratio
 - 1.0 Straight line, finding the equation of straight line, shortest distance between two points
 - 1.0 Plane
 - 1.0 Sphere in space

3. Differential Calculus (16 hrs)
 - 2.0 Successive differentiation. Libnez's theorem
 - 2.0 Partial differentiation: Partial derivatives, total differential co-efficient, chain rule. Euller's theorem of homogeneous function, Jacobians, curl, gradience and divergent and some identities among them.
 - 2.0 Differential equation: Order, degree and meaning of solution of differential equations. Linear, non-linear differential equation, first order equation (separable forms, linear and Bernoulli's form, exact equation and their solutions), second order linear equations (linear equations with constant co-efficients homogeneous and non-homogeneous equation, equations reducible to linear form with constant co-efficients)

4. Integral Calculus (18 hrs)
- 3.0 Laplace transform, solution of differential equation by Laplace transform
- 3.0 Beta and gamma function
- 3.0 Fourier series
5. Statistics and Probability (14 hrs)
- 1.1 Measure of central tendency: Mean, median, mode, mean derivation, standard deviation, rank and rank correlation
- 1.1 Probability: Law of probability and conditional probability
- 1.1 Binomial distribution and Poisson distribution
- 1.1 Continuous and normal distribution
- 1.1 Curve fitting by least square method

RECOMMENDED BOOKS

10. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.
10. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
10. Applied Mathematics by Dr. RD Sharma
10. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar
10. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
10. Engineering Mathematics by Dass Gupta
10. Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi
8. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
9. Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi
10. Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi
1. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
1. Engineering Mathematics, Vol I & II by AK Gupta, Macmillan India Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Topic No.	Topic	Time Allotted (Hrs)	Marks Allocation
1	Algebra	16	20
2	Co-ordinate Geometry	16	20
3	Differential Calculus	16	20
4	Integral Calculus	18	25
5	Statistics and Probability	14	15
Total		80	100

2.3 APPLIED PHYSICS – II

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RATIONALE

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

DETAILED CONTENTS

1. Classification of materials (4 hrs)
Classification of materials into Conducting materials, Insulating materials, semiconducting materials with reference to their atomic structure, magnetic material (para, dia and ferro)
2. Fundamentals of D.C. & A.C. (8 hrs)
 - 1.4 D.C: Electric current, Ohm's Law, Series and parallel combination of resistances, Kirchoff's law and their simple applications. Principle of Wheatstone's bridge and its application in meter bridge and post office box
 - 1.5 A.C: Sinusoidal current and EMF. Peak, r.m.s values, inductive, capacitive, reactances, impedance
3. Moving Charge & Magnetic Field (10 hrs)
Magnetic behaviour of current carrying conductor; Magnetic behaviour of current Carrying solenoid; concept of Magnetic Field: Magnetic line of forces; force on a current - carrying conductor in a magnetic field ; Fleming's Left hand rule ; force on a charge moving in a magnetic field; motion of charged particles in a magnetic field; Magnetic field due to a current carrying conductor(Biot- Savart law); Force between two parallel current carrying conductors .
4. Modern Physics (12 hrs)
Laser- Absorption and emission of energy by atom, spontaneous and stimulated emission, Population inversion, Main component of Laser and types of Laser: Ruby Laser, He, Ne and semiconductor Laser and their applications. Super Conductivity- Phenomenon of super conductivity, effect of magnetic field, critical field, type I & type II super conductors and their applications. Radioactivity, nuclear stability, radio active emission, radiation damage, concept of nuclear fission and fusion.
5. Application of Optics: (6 hrs)
 - 1.4 Concept of interference

- 1.5 Optical slide film projector (principle and operation)
 - 4.0 Introduction to fibre, optical fibre materials, types, light propagation and applications
 - 4.0 Critical angle, total internal reflection, optical sensor
6. Semi Conductor Physics and its Application (12 hrs)
- Energy band in solids, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semiconductors, Electrons and holes as charge carriers in semiconductors, effect of temperature in conduction in semiconductors, P-type and N-type semiconductors, PN junction formation, barrier voltage, forward and reverse biasing of a junction diode, PN junction device characteristics, formation of transistor, transistor action, base, emitter and collector currents and their relationship, LEDs, photoelectric effect and photo devices and their applications..
7. Non Conventional Energy Sources (12 hrs)
- 7.1 Wind Energy: Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill, India's wind energy programme.
 - 7.2 Solar Energy: Solar radiation and potentiality of solar radiation in India, unit of solar radiation, solar constant measurement of solar radiation by Pyrometer, and by Insolation meter (Suryamapi) uses of solar energy: solar cooker, solar water heater, solar photovoltaic cells, solar energy collector, solar by planets in India, Modern applications in technology (Qualitative only).

LIST OF PRACTICALS

- 0. Determination of Resistivity of a given material through P.O.Box.
- 0. Determination of Resistivity of a given material through Meter Bridge.
- 0. To verify the Laws of Series and Parallel combination of resistances by P.O.Box
- 0. To verify the Laws of Series and Parallel combination of resistances by Meter Bridge.
- 0. Demonstration of He, Ne Laser (Interferometer)
- 0. To draw the characteristics of transistor
- 0. Verification of Ohm's law.
- 0. Verification of Kirchoff's laws.
- 0. Conversion of Galvano meter into ammeter & Voltmeter.
- 0. To Draw the characteristics of PN Junction Diode & Determination of Static & Dynamic Resistance.
- 0. Measurement of solar intensity with the help of Insolation meter (suryamapi)/Lux meter

RECOMMENDED BOOKS

1. Applied Physics Vol. II, TTTI Publication Tata McGraw Hill, New Delhi
1. Basic Applied Physics by RK Gaur; Dhanpat Rai and Co . New Delhi
3. Comprehensive Practical Physics - Volume I and II by JN Jaiswal; Laxmi Publishers
4. Numerical Problems in Physics - Volume I and II by RS Bharaj; Tata McGraw Hill, New Delhi
5. Simple Course in Electricity and Magnetism by CL Arora; S Chand and Co, New Delhi
6. Fundamental Physics - Volume I and II by Gomber and Gogia; Pardeep Publications, Jalandhar
7. A Text Book of Optics by Subramanian and Brij Lal
8. Physics Laboratory Manual by PK Palanisamy, Scitech Publications
9. Fundamentals of Physics by Resnick and Halliday, Asian Books Pvt. Ltd., New Delhi
10. Concepts in Physics by HC Verma; Bharti Bhawan Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Topic No.	Topic	Time Allotted (Hrs)	Marks Allocation
1.	Classification of materials	4	5
2.	Fundamentals of D.C. & A.C.	8	10
3.	Moving Charge and Magnetic Field	10	15
4.	Modern Physics	12	20
5.	Application of Optics	6	10
6.	Semiconductor Physics and its application	12	20
7.	Non Conventional Energy Sources	12	20
Total		64	100

2.4 FUNDAMENTALS OF ELECTRICAL ENGINEERING

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RATIONALE

This course will enable the students to understand the basic concepts and principles of d.c and a.c fundamental, a.c circuits, batteries, electromagnetic induction etc. including constant voltage and current sources. A diploma holder may be involved in various jobs ranging from preventive maintenance of electrical installation to fault location etc. In addition, he may be working in testing laboratories where he uses measuring instruments. To carry out these and similar jobs effectively, knowledge of basic concepts, principles and their applications is very essential.

DETAILED CONTENTS

1. Overview of DC Circuits (08 hrs)
 - 0.0 Ohm's Law. Concept of voltage, current, power and energy
 - 0.0 Simple problems on series and parallel combination of resistors with their wattage consideration,
 - 0.0 Application of Kirchoff's current law and Kirchoff's voltage law to simple circuits. Conversion of circuits from Star to Delta and Delta to Star.
 - 0.0 Constant Voltage and Constant Current Sources
 -) Concept of constant voltage source, symbol and graphical representation characteristics of ideal and practical sources.
 - b) Concept of constant current sources, symbol, characteristics and graphical representation of ideal and practical current sources.
2. DC Circuit Theorems (06 hrs)

Thevenin's theorem, Norton's theorem, application of network theorem in solving d.c circuit problems.
3. Electro Magnetic Induction (08 hrs)
 -) Concept of magnetic field produced by flow of current, Magnetic circuit, concept of magneto-motive force (MMF), flux, reluctance, permeability, analogy between electric and magnetic circuit.
 -) Faraday's law and rules of electro-magnetic induction, principles of self and mutual induction, self and mutually induced e.m.f, simple numerical problems.
 -) Concept of current rise, decay and time constant in an inductive (RL) circuit.
 -) Energy stored in an inductor and a capacitor.

4. Batteries (06 hrs)
- 4.1 Basic idea about primary and secondary cells
 - 4.2 Construction, working and applications of Lead-Acid, Nickel-Cadmium and Silver-Oxide batteries
 - 4.3 Charging methods used for lead-acid battery (accumulator)
 - 4.4 Care and maintenance of lead-acid battery
 - 4.5 Series and parallel connections of batteries
 - 4.6 General idea of solar cells, solar panels and their applications
5. AC Fundamentals (08 hrs)
- 5.1 Concept of alternating voltage and current
 - 5.2 Difference between a.c and d.c
 - 5.3 Concept of cycle, frequency, time period, amplitude, instantaneous value, average value, r.m.s. value, maximum value, form factor and peak factor.
 - 5.4 Representation of sinusoidal quantities by phasor diagrams.
 - 5.5 Equation of sinusoidal wave form (with derivation)
 - 5.6 Effect of alternating voltage applied to a pure resistance, pure inductance and pure capacitance.
6. AC Circuits (08 hrs)
- 5.0 Inductive reactance and Capacitive reactance
 - 5.0 Alternating voltage applied to resistance and inductance in series.
 - 5.0 Alternating voltage applied to resistance and capacitance in series.
 - 5.0 Impedance triangle and phase angle
 - 5.0 Solutions and phasor diagrams for simple RLC circuits (series and parallel).
 - 5.0 Introduction to series and parallel resonance and its conditions
 - 5.0 Power in pure resistance, inductance and capacitance, power in combined RLC circuits. Power factor, active and reactive power and their significance, importance of power factor.
 - 5.0 j-notation and its application in solving series and parallel a.c circuits
 - 5.0 Definition of conductance, susceptance and admittance

7. Various Types of Power Plants (04 hrs)

Brief explanation of principle of power generation in thermal, hydro and nuclear power stations and their comparative study. Elementary block diagram of above mentioned power stations

A Visit to a nearby Power Station(s) may be organized for better understanding and exposure.

LIST OF PRACTICALS

1. Familiarization of measuring instruments viz voltmeter, ammeter, CRO, Wattmeter and multi-meter and other accessories
 2. Determination of voltage-current relationship in a dc circuit under specific physical conditions and to draw conclusions.
 3. To measure (very low) resistance of an ammeter and (very high) resistance of a voltmeter
 4. To verify in d.c circuits:
 - a.. Thevenin's theorem,
 - b. Norton's theorem,
 5. To observe change in resistance of a bulb in hot and cold conditions, using voltmeter and ammeter.
 6. Verification of Kirchhoff's Current Law and Kirchhoff's Voltage Laws in a dc circuit
 6. To find the ratio of inductance of a coil having air-core and iron-core respectively and to observe the effect of introduction of a magnetic core on coil inductance
 8. To find the voltage current relationship in a single phase R-L and R-C Series circuits, draw their impedance triangles and determination of the power factor in each case .
 9. To test a lead - acid storage battery and to charge it.
 10. Measurement of power and power factor in a single phase R.L.C. circuit and to calculate active and reactive power.
1. Visit to nearby Power Station(s) and prepare a report.

RECOMMENDED BOOKS

1. Electrical Technology, Fifth Edition by Edward Hughes, Longman Publishers
2. Basic Electrical and Electronics Engineering by SK Sahdev; Dhanpat Rai and Co, New Delhi

3. Experiments in Basic Electrical Engineering by SK Bhattacharya, KM Rastogi; New Age International (P) Ltd.; Publishers New Delhi
0. Electrical Science by Choudhury S.; Narosa Publishing House Pvt Ltd, Darya ganj, New Delhi
0. Basic Electrical and Electronics Engineering by Kumar KM, Vikas Publishing House Pvt Ltd, Jang pura, New Delhi
0. Basic Electrical Science and Technology by Kumar KM, Vikas Publishing House Pvt Ltd, Jang pura, New Delhi
0. Basic Electrical Engineering by Mool Singh, Galgotia Publications Pvt Ltd. New Delhi
0. Electrical Technology by BL Theraja, S Chand and Co, New Delhi
0. Basic Electricity by BR Sharma; Satya Prakashan; New Delhi
0. Principles of Electrical Engineering by BR Gupta, S Chand and Co, New Delhi
0. Basic Electrical Engineering by PS Dhogal, Tata Mc Graw Hill, New Delhi
0. Basic Electrical Engineering by JB Gupta; SK Kataria and Sons, New Delhi
0. Experiments in Basic Electrical Engineering by GP Chhalhotra, Khanna Publishers, New Delhi

SUGGESTED DISTRIBUTION OF MARKS FOR PAPER SETTER

Sr. No.	Topic	Time Allotted (hrs)	Percentage Weightage	Marks Allocation
1.	Overview of DC Circuits	8	16.6	15
2.	DC Circuit Theorems	6	12.5	10
3.	Electro Magnetic Induction	8	16.6	15
4.	Batteries	6	12.5	10
5.	AC Fundamentals	8	16.6	20
6.	AC Circuits	8	16.6	20
7.	Various Types of Power Plants	4	6.25	10
Total		48	100	100

2.5 ELECTRONIC COMPONENTS AND MATERIALS (ECM)

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RATIONALE

Study of Electronic components and Materials is important from point of view of manufacturing, testing and maintenance of electronic devices and systems. Students should understand the procedure of identification, characteristics, specifications, merits, limitations, and applications of electronic components and materials.

DETAILED CONTENTS

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| 1. | Materials | (32 hrs) |
| 1.1 | Classification of materials
Conducting, semi-conducting and insulating materials with a brief reference to their atomic structure. | (4 hrs) |
| 1.2 | Conducting Materials
Resistors, factors affecting resistivity such as temperature, alloying and mechanical stressing. Classification of conducting materials into low resistivity and high resistivity materials. | (10 hrs) |
| 1.3 | Insulating Materials
Important relevant characteristics (electrical, mechanical and thermal) and applications of the following material:
Mica, Glass, PVC, Silicon, Rubber, Bakelite, Cotton, Ceramic, Polyester, Polythene and Varnish. | (10 hrs) |
| 1.4 | Magnetic Materials
Different Magnetic materials; (Dia, Para, Ferro) and their properties. Ferro magnetism, Domains, permeability, Hysteresis loop. Soft and hard magnetic materials, their examples and typical applications. | (8 hrs) |
| 2. | Components | (32 hrs) |
| 2.1 | Capacitors | (8 hrs) |
| | a) Concept of capacitance and capacitors, units of capacitance, types of capacitors, constructional details and testing specifications | |
| | b) Capacity of parallel plate capacitors, spherical capacitors, cylindrical capacitor. | |
| | c) Energy stored in a capacitor. | |
| | d) Concept of di-electric and its effects on capacitance, di-electric constant, break down voltage. | |
| | e) Series and parallel combination of capacitor. Simple numerical problems of capacitor. | |
| | f) Charging and discharging of capacitor with different resistances in circuit, concept of current rise and decay, time constant in R-C circuits, simple problems. | |

- 2.2 Resistors: Carbon film, metal film, carbon composition, wound and variable types (presets and potentiometers) (3 hrs)
- 2.3 Transformer, inductors and RF coils: (4 hrs)
Methods of manufacture, testing, Need of shielding, application and trouble shooting
- 2.4 Surface Mounted Devices (SMDs): (4 hrs)
Constructional detail and specifications.
- 2.5 Connectors, Relays, switches and cables: (5 hrs)
Different types of connectors, relays, switches and cables, their symbols, construction and characteristics.
- 2.7 Semi Conductors and Integrated Circuits (8 hrs)
- Basic characteristics of Semiconductor materials, testing of diodes, transistors, FETs and SCRs.
 - Various processes in IC manufacturing. Hybrid IC technology.
 - Superconductivity and piezoelectric ceramic transducer elements

RECOMMENDED BOOKS

0. Electronic components and Materials by Grover and Jamwal; Dhanpat Rai and Sons, New Delhi
0. Basic Electronics and Linear Circuits by NN Bhargava and Kulshreshta; Tata McGraw Hill, New Delhi
0. Electronic components and Materials by SM Dhir, Tata McGraw Hill, New Delhi
0. Electrical and Electronic Engineering Materials by SK Bhattacharya, Khanna Publishers, New Delhi
0. Electronic Engineering Materials by ML Gupta, Dhanpat Rai and Sons; New Delhi.

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Topic No.	Topic	Time Allotted (Hrs)	Marks Allocation
1	Materials	32	50
2	Components	32	50
Total		64	100

2.6 COMPUTER PROGRAMMING AND APPLICATIONS IN ELECTRONICS ENGINEERING

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RATIONALE

Computer plays a very vital role in present day life, more so, in the professional life of Diploma engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposure to various engineering applications of computers. The knowledge of C language will be reinforced by the practical exercises and demonstration of application software in the field of Electronics Engineering during the course of study. Introduction to data base management system is also a very significant field with vast employment potential.

DETAILED CONTENTS

1. Algorithm and Program Development 4 hrs)
 -) Steps in development of a program
 -) Flow-charts, algorithm development
 -) Introduction to various computer languages
 -) Concept of interpreter, compiler, high level language(HLL), machine language (ML) and Assembly Language

2. Program Structure (C Programming) (24 hrs)
 -) History of 'C', data types, input output statements, arithmetic and logical operations, data assignments, precedence and associativity
 -) I/O statements
Assignment, Variables, arithmetic operation- their precedence, data types standard I/O function, formulated I/O
 -) Control Statements
Logical and relational operators; if-else, while, do- while, for loops, breaks, switch statements
 -) Functions:
Function declaration, parameter passing- by value, storage classes (Local, Global and Static variables), standard library functions
 -) Arrays:
Single and multi dimensional arrays, character arrays
 -) Pointers:

-) To various data types, pointers in parameters passing, pointers to function Structures:
Definition of a structure, pointer to structure, union and array of structure
-) Strings:
String processing, functions and standard library function
-) Data files
File handling and manipulation, file reading and writing, Binary and ASCII files, file records using standard function type mouse

2. Software Applications in Electrical Engineering (4hrs)

Computer application overview through various applications software related to Electronics Engineering branch such as: MATLAB, Circuit Maker, Electronic workbench etc.

LIST OF PRACTICALS

- 0. Programming exercise on executing a C Programs.
- 0. Programming exercise on editing a C program.
- 0. Programming exercise on defining variables and assigning values to variables
- 0. Programming exercise on arithmetic and relation operators
- 0. Programming exercise on arithmetic expressions and their evaluation
- 0. Programming exercise on reading a character
- 0. Programming exercise on writing a character
- 0. Programming exercise on formatting input using print
- 0. Programming exercise on formatting output using scan
- 0. Programming exercise on simple IF statement
- 0. Programming exercise on IF... ELSE statement
- 0. Programming exercise on SWITCH statement
- 0. Programming exercise on GOTO statement
- 0. Programming exercise on DO-WHILE statement
- 0. Programming exercise on FOR statement
- 0. Programming exercise on one dimensional arrays
- 0. Programming exercise on two dimensional arrays
- 0. Demonstration of Application software to Electronics Engineering branch such as: MATLAB, Circuit Maker, Electronic workbench etc.

INSTRUCTIONAL STRATEGY

This course is a highly practical and self- study oriented courses. The teachers are expected to explain the theoretical part and make the students to execute and debug different programs. The PC needed to have either Turbo C.

RECOMMENDED BOOKS

0. Programming in C by Schaum series McGraw Hill
0. Programming in C by Kerning Lan and Richie; Prentice Hall of India, New Delhi
0. Programming in C by Balaguru Swamy, Tata McGraw Hill, New Delhi.
0. Let us C- Yashwant Kanetkar, BPB Publications, New Delhi
0. Vijay Mukhi Series for C and C++
0. Programming in C by R Subburaj, Vikas Publishhing House Pvt. Ltd., Jangpura, New Delhi
0. Programming in C by Kris A Jansa, Galgotia Publications Pvt. Ltd., Daryaganj, New Delhi
0. Programming in C by BP Mahapatra, Khanna Publishers, New Delhi
0. Elements of C by MH Lewin, Khanna Publishers, New Delhi
0. The Complete Reference to Visual Basic 6, by Noel Jerke, Tata McGraw Hill, New Delhi
0. Web site www.Beyondlogic.org
0. Pointers in C by Yashwant Kanetkar, BPB Publishers New Delhi
0. Programming in Applications by Chandershekhar, Unique International Publications, Jalandhar
0. The essentials of Computer Organizing and Architecture by Linda Null and Julia Labur, Narosa Publishing House Pvt. Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Topic No.	Topic	Time Allotted (Hrs)	Marks Allocation
1.	Algorithm and Program Development	4	15
2.	Program Structure (C Programming)	24	70
3.	Software Applications	4	15
Total		32	100

2.7 GENERAL WORKSHOP PRACTICE - II

(Common with Civil, Electrical, Eltx., and Mechanical Engineering)

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RATIONALE

Manual abilities to handle engineering materials with hand tools need to be developed in the students. This course aims at developing generic manual and machining skills in the students. They will be using different types of tools/equipment in different shops for fabrication purposes. Besides above, the development of dignity of labour, precision, safety at work places, team working and development of right attitude are other objectives.

DETAILED CONTENTS

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.

PRACTICAL EXERCISES

The following shops are included in the syllabus :

1. Carpentry and Painting shop-II
2. Fitting and Plumbing shop-II
3. Welding shop-II
4. Electric shop-II
1. Forging shop
2. Machine shop

1. Carpentry and Painting Shop-II

- 1.1 Introduction to joints, their relative advantages and uses.
Job I Preparation of Dovetail joint and glued joint.
Job II Preparation of Mitre Joint
Job III Preparation of a lengthening Joint
Job IV Preparation of at least one utility job with and without lamination.
- 1.2 Demonstration of job showing use of Rip Saw, Bow saw and Trammel, method of sharpening various saws.
- 1.3 Demonstration of job on Band Saw and circular saw, universal wood working machine, saw resharpening machine, Saw Brazing unit.
- 1.4 Importance and need of polishing wooden items, Introduction to polishing materials.
Job V Preparation of surface before polishing.
Job VI Application of primer coat.
Job VII Polishing on wooden items.

2. Fitting and Plumbing Shop-II

- 2.1 Description and demonstration of various types of drills, taps and dies
- 2.2 Selection of dies for tapping. Types of taps, tapping, dieing and drilling operations.
 - Job I Making internal and external threads on a job by tapping and dieing operations (manually)
- 2.3 Precautions while drilling soft metals, specially aluminum and lead.
 - Job II Drilling practice on soft metals (Aluminum, Brass and lead)
- 2.4 Care and maintenance of measuring tools like calipers, steel rule, try square, vernier, micrometer, height gauge, combination set, reading gauge. Handling of measuring instruments, checking of zero error, finding of least count.
 - Job III Preparation of a job by filing on non-ferrous metal.
 - Job IV Production of a utility job involving all the above operations.
 - Job V Preparation of job involving thread on GI pipe/ PVC pipe and fixing of different types of elbow T - Union, socket, stopcock, taps, etc
- 2.5 Description and demonstration of various types of drills, taps and dies; Selection of dies for tapping; Types of taps, Tapping and dieing operations.

3. Welding Shop-II

- 3.1 Introduction of the gas welding, gas welding equipment, adjustments of different types of flames, demonstration and precautions about handling welding equipment.
 - Job I Practice in handling gas welding equipment and welding practice.
- 3.2 Common welding joints generally made by gas welding.
 - Job II Preparation Butt joint by gas welding.
 - Job III Preparation of small cot conduit pipe frame by electric arc welding/gas welding.
 - Job IV Preparation of square pyramid from M.S rods by welding (type of welding to be decided by students themselves).
 - Job V Exercise job on spot/seam welding machine.

4. Electric Shop-II

- 4.1 Importance of three phase wiring and its effectiveness.
 - Job I Laying out 3 phase wiring for an electric motor or any other 3 phase machine.
- 4.2 Estimating and costing power consumption.
 - Job II Connecting single phase energy meter and testing it. Reading and working out the power consumption and the cost of energy.
 - Job III Checking continuity of connection (with tester and bulbs), location of faults with a multimeter and their rectification in simple machines and/or other electric circuits fitted with earthing.
- 4.3 Demonstration of dismantling, servicing and reassembling of a table fan/ceiling fan/air cooler/mixer/electric iron, Electric heater, geaser, electric oven etc.
 - Job IV Dismantling, serving and reassembling of any of the above electrical appliances.

Job V Demonstration of testing single phase/three phase electrical motor by using voltmeters ammeter clip on meter technometer etc.

Job VI Reversing the rotation of motor.

5. Forging Shop

Introduction to forging, forging tools, tongs, blowers/pressure blowers, hammers, chisels, punch, anvil, swage-block etc. Forging operations.

Job I Forge a L hook or ring from MS rod 6 mm ϕ

Job II Forge a chisel and give an idea of hardening and tempering

Job III Lap joint with forge welding

Job IV High Strength Steel tools – forging of lathe and shaper tools

6. Machine Shop

Introduction to various machines used in machine shop.

Job I Exercise on simple turning

Job II Exercise on taper turning

Job III Marking and drilling practice on mild steel piece

Job IV Marking and drilling practice on aluminium piece

Job V Demonstration of various functions of CNC Machine

RECOMMENDED BOOKS

1. Manual on Workshop Practice by K Venkata Reddy, KL Narayana and P Kaunaioh; MacMillan India Ltd., New Delhi
2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi

ECOLOGY AND ENVIRONMENTAL AWARENESS CAMP

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the eco system and controlling pollution by pollution control measures. He should also be aware of environmental laws related to the control of pollution.

The camp may be organized at a stretch for 3 to 4 days. During the camp, experts from various organizations/institutes etc. may be invited to deliver lectures on ecology and environmental issues. The students may be encouraged to read papers or give seminar during the camp on following broad topics. There will be no examination for this subject.

1. Basics of ecology, eco system and sustainable development
2. Conservation of land reforms, preservation of species, prevention of advancement of deserts and lowering of water table
3. Sources of pollution - natural and man made, their effects on living and non-living organisms
4. Pollution of water - causes, effects of domestic wastes and industrial effluent on living and non-living organisms
5. Pollution of air-causes and effects of man, animal, vegetation and non-living organisms
6. Sources of noise pollution and its effects
7. Solid waste management; classification of refuse material, types, sources and properties of solid wastes, abatement methods
8. Mining, blasting, deforestation and their effects
9. Legislation to control environment
10. Environmental Impact Assessment (EIA), Elements for preparing EIA statements
11. Current issues in environmental pollution and its control
12. Role of non-conventional sources of energy in environmental protection