CURRICULUM FOR

DIPLOMA IN

MECHANICAL, ELECTRICAL & ELECTRONICS

(FIRST SEMESTER)

GROUP A

MADHYANCHAL
PROFESSIONAL UNIVERSITY

Scheme: CGPA-2018

MADHYANCHAL PROFESSIONAL UNIVERSITY

DIPLOMA IN MECHANICAL, ELECTRICAL & ELECTRONICS

SEMESTER: FIRST
COURSE CODE: **101**
NAME OF COURSE: **COMMUNICATIONSKILLS**
PAPER CODE: **5161**

UNIT-1

COMMUNICATION PROCESS AND ITS NEEDS

1.1 (i) How to make communication effective
(ii) Barriers in communication, Removal of barriers

1.2 Grammar and vocabulary for correct English usage.
(i) Determiners, Prepositions, Auxiliary verbs and subject-verb agreement
(ii) Rewrite as directed (change voice, correct form of verbs/ tenses)
(iii) Vocabulary – One word substitution, words often misused and wrongly spelt

UNIT-2

PASSAGES OF COMPREHENSION

2.1 Prescribed passages (six from existing syllabus)
i Language of Science
ii Desalination or Desalting Process
iii Safety Practices
iv Non-conventional Sources of Energy
v Our Environment
vi Entrepreneurship
2.2 Writing summary, moral and characterization of any one story from the book prescribed.

UNIT-3

BUSINESS COMMUNICATION
(One question with internal choice)

3.1 Principles of effective business correspondence Its parts, mechanics, styles and forms
3.2 Application for job, Bio-Data and C.V.
3.3 Letter of Enquiry
3.4 Placing order
3.5 Complaint

UNIT-4

COMPOSITION & TRANSLATION

4.1 Writing paragraphs of 150 words on topics of general interest i.e. pollution, ragging in college, importance of computers, importance of communication skill, importance of science and technology etc.
4.2 Translation (Hindi to English and vice-versa).

UNIT-5

UNSEEN PASSAGES & PRECIS WRITING

5.1 Answer the questions based on the passage.

5.2 Give suitable title

5.3 Writing Practice

REFERENCES

1. English Conversation Practice - Grant Taylor
2. Practical English Grammar - Thomson & Martinet
3. Communication Skills for Technical Students Book – I, Book – II - M/S Somaiya blication, Bombay
4. Living English Structure - S. Allen
5. English Grammar, Usage, and Composition- Tickoo & Subramanian, S. Chand & Co. Standard Allen Longman.
6. Essentials of Business Communication - Dr. Rajendra Pal & J.S. Korlahalli S.Chand & Sons, New Delhi.
7. Effective Business Communication - M.V. Rodriques, Concept Pub. Co., New Delhi.
8. Communication for Business - Shirely Taylor, Longman, England.
9. Communication for Engineers and Professors- P. Prasad, S.K.Kataria and sons publications, New Delhi
10. Technical English Book-II, - Somaya Publications, New Delhi

MADHYANCHAL PROFESSIONAL UNIVERSITY

DIPLOMA IN MECHANICAL, ELECTRICAL & ELECTRONICS

SEMESTER: FIRST
COURSE CODE: **102**
NAME OF COURSE: **PHYSICS**
PAPER CODE: **6031**

UNIT-1

UNITS & MEASUREMENT

Fundamental and derived units, Scalar and vector, Basic requirements to represent vector Symbols, abbreviation, and proculation, Linear measurement by vernier calipers, screw gauge and spherometer, Angular measurement by angular vernier

MOTION

Motion and its type, Linear motion (laws and equation), Circular motion, Angular velocity and relation with linear velocity, Centripetal acceleration, Centripetal and Centrifugal forces Rotatory motion, Axis of rotation, Moment of Inertia, Radius of gyration, Kinetic energy of rotation, Numerical problems and solution on the topic

UNIT-2

MOLECULAR PHENOMENON OF SOLIDS, LIQUIDS AND GASES

Postulates of Molecular Kinetic Theory of Structure of matter, Brownian motion, Kinetic and Potential energy of molecules, Kinetic theory of gases, Postulates, Calculation of pressure by Kinetic theory, Prove of different gases law by Kinetic theory.

PROPERTIES OF MATTER

Elasticity: Meaning, definition, stress, stain, Hook's law and elastic limit,
Surface Tension: Meaning, definition, molecular forces, cohesive and adhesive forces, surface energy, capillary rise and capillary rise method.
Viscosity: Meaning, definition, stream line and turbulent flow, critical velocity, Stock's law, Numerical problems and solution on the topic.

UNIT-3

HEAT

Heat and temperature, concept of heat as molecular motion,Transmission of heat, study state and variable state, Concept of heat capacity, specific heat and latent heat, Calorimeter and its uses, Thermodynamics, Relation between heat and work, Mechanical equivalent of heat, First law of thermodynamics and its application, Second law of thermodynamics and its application, Carnot cycle, Numerical problems and solution on the topic.

HEATING EFFECT OF CURRENT AND THERMOELECTRICITY

Heating effect of electric current:Joule's law, work energy and power in electric circuit, calculation of electric energy, Thermo electricity, Seeback effect and thermoelectric power. Neutral temperature, temperature of inversion and relation between them, Thermo electric thermometer and thermo couples, Numerical problems and solution on the topic.

UNIT-4

SOUND

Production of sound waves(Longitudinal and transverse waves), Progressive and stationary waves, Basic knowledge of refraction , reflection, interference and diffraction. Ultrasonic, Audible range, Production of ultrasonic, properties and uses

OPTICS AND OPTICAL INSTRUMENTS

Refraction, critical angle and total internal reflection, refraction through lenses and problems Power of lenses, Spherical and chromatic aberrations, Simple and compound microscope, telescope and derivation for their magnifying power, Numerical problems and solution on the topic.

UNIT-5

ELECTROSTATICS AND ELECTROMAGNETIC INDUCTION

Coulomb's law, Electric field intensity, potential, Capacity, principle of capacitor, types of capacitor, combination of capacitors, Electromagnetic Induction: Faraday's law, Lenz's law Self and mutual inductance, Transformer and electric motor, Induction coil

MODERN PHYSICS, BASIC ELECTRONICS

Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells Radioactivity : decay constant, Half life, mean life Properties of nucleus, nuclear mass, mass defect Production of x-rays, properties and its uses, Thermal emission, semiconductors, Types of semiconductors, Explanation of conductor, semiconductor and insulators on the basis of band theory, P-N junction, diode as rectifier.

LIST OF EXPERIMENTS

1. Refractive index of prism (I-d) curve
2. Refractive index of prism (spectrometer)
3. Focal length of a convex lens by u-v method
4. Focal length of a convex lens by displacement method
5. Verification of Ohm's law
6. To find out unknown resistance by meter bridge
7. To find out internal radius of hollow tube by vernier calipers.
8. To find out volume of given cylinder by screw gauge.

9. Surface tension by Capillary rise method. Coefficient of viscosity Coefficient of Thermal conductivity by searl's method.
10. Verification of Newton's cooling law.

REFERENCES

1. APPLIED PHYSICS VOL. 1 & 2 - SAXENA AND PRABHAKAR
2. PHYSICS - TTTI PUBLICATION
3. PHYSICS VOL. 1 &2 - HALLIDAY AND RESNIC R
4. ENGINEERING PHYSICS - GAUR AND GUPTA
5. PRINCIPLE OF PHYSICS - BRIJ LAL & SUBRAMANYAN
6. PHYSICS FOR TECHNICAL EDUCATION - LS ZEDNOV

MADHYANCHAL PROFESSIONAL UNIVERSITY

DIPLOMA IN MECHANICAL, ELECTRICAL & ELECTRONICS

SEMESTER: FIRST
COURSE CODE: **103**
NAME OF COURSE: **CHEMISTRY**
PAPER CODE: **6032**

UNIT-1

ATOMIC STRUCTURE AND RADIOACTIVITY

Discovery of electron, proton ,neutron and nucleus. Ruther ford's and Bohr's model of an atom. Bohr Burry scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital .Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, numerical problems on half life period, fission and fusion.

SURFACE CHEMISTRY AND ITS APPLICATION

True solution, colloidal solution and suspension, lyophobic and lyophillic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

UNIT-2

ELECTROCHEMISTRY

Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faradays Law, electroplating of copper and nickel.

COLLIGATIVE PRPOPERTIES

Osmosis & osmatic pressure, Relative vapour pressure and Routls law. Internal energy (enthalpy) Entrophy, Entrophy fusion free energy, Effect of change in temperature catalysis.

CHEMICAL BONDING AND CATALYSIS

(A) Bonding: Nature of bonds- Electrovalent, Co-valent, co-ordinate and hydrogen bond.
(B) Catalysis : Types , theory characteristic, positive , negative, auto and induced catalyst. Catalytic Promoter, and catalytic inhibitors. Industrial Application of catalysis.

UNIT-3

WATER

Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful – effects of hard water in boiler. Municipal water supply. Numerical on soda lime process. Determination of hardness of water by O. Hener's, EDTA and soap solution method

METALS AND ALLOYS

Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principal of metallurgy, minerals/ ores, ore dressing, roasting ,smelting, bassemerisation, fluxes, purification . Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy.

IONIZATION, PH VALUE CORROSION AND PROTECTION

Arhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indication (acidimetry and alkalimetry). Explanation of corrosion, types of corrosion, factors effecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control.

GLASS, CEMENT AND REFRACTORY

Glass: Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass,.

Cement: Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement.

Refractories: Meaning, characteristics, use of common refractory materials.

UNIT-4

HIGH POLYMERS, RUBBER AND INSULATORS

Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters , Bakelite. Synthetic fibers – nylon, rayon, decron, and polyesters.

Definition characteristics , classification and properties of insulators. Glass, wool and thermocole. Idea about rubber and vulcanization.

LUBRICANTS, PAINTS AND VARNISHES

Lubricants: Meaning, type and theory of lubricants, properties of a good lubricants, Flash and fire point and cloud point, emulsification number, viscosity.

Paints and Varnishes: Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications

UNIT-5

FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES

Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation .

Fire extinguishers – Description and use.

Explosives – Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X.

POLLUTION AND CONTROL

Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead.

LIST OF EXPERIMENTS

1. To identify one Anion and Cation in a given sample.
2. Determination of flesh point and fire point of a given sample of oil by Abel's apparatus.
3. Determination of viscosity by Red Wood Viscometer no. 1 and no.2.
4. Redoximetry Titration :
    a. Percentage of Iron in given sample of alloy.
    b. Determination of strength of ferrous ammonium sulphate.

c. Determination of strength of anhydrous ferrous sulphate and ferrous sulphate.

5. Determination of hardness of water by :
    a. EDTA Method and Soap Solution Method
6. Determination of solid content in the given sample of water.
7. Determination of percentage of moisture in the given sample of coal by proximate analysis.

REFERENCES

1. PHYSICAL CHEMISTRY – BAHL AND TULI
2. INORGANIC CHEMISTRY– SATYAPRAKASH
3. MODERN TEXT BOOK OF APPLIED CHEMISTRY – DR. G. C. SAXENA, JAIN PRAKASHAN, INDORE
4. APPLIED CHEMISTRY - DR. G. C. SAXENA, DEEPAK PRAKASHAN, GWALIOR
5. APPLIED CHEMISTRY – SHRIVASTAVA & SINGHAL, PBS PUBLICATION, BHOPAL
6. ENGINEERING CHEMISTRY– UPPAL
7. ENGINEERING CHEMISTRY – RAO AND AGARWAL
8. ENGINEERING CHEMISTRY – P.C. JAIN
9. POLYMER CHEMISTRY – O.P. MISHRA
10. APPLIED CHEMISTRY – H.N. SAHNI, DEEPAK PRAKASH

MADHYANCHAL PROFESSIONAL UNIVERSITY

DIPLOMA IN MECHANICAL, ELECTRICAL & ELECTRONICS

PAPER CODE: **6033**
SEMESTER: FIRST
COURSE CODE: **104**
NAME OF COURSE: **MATHEMATICS**

UNIT-1

ALGEBRA

Permutation - Meaning of factorial n - Permutation of 'n' dissimilar thing taken 'r' at a time, Combination - Combination of n dissimilar things taken 'r' at a time,
Binomial Theorem - Statement of the theorem for positive integer- General Term, Middle term, Constant term, Partial Fractions - Define a proper-improper fraction - Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors, Determinant - Concept & principles of determinants - Properties of determinant, Simple examples, Complex Numbers - Algebra of Complex Numbers - Polar form

UNIT-2

TRIGONOMETRY

Allied angles, Trigonometrically ratios of sum and difference of angles, (Only statement) , Sum and difference of trigometric ratios (C-D formula) , Multiple angles (Only double angle and half angle), Properties of triangle (without proof)

MATRIX

Definition of Matrix, Types of Matrix-Row, Column, Square, Unit, Upper and lower triangular, Symmetric & Skew Symmetric, Singular and non Singular Matrices, Adjoint of a Matrix, Inverse of a Matrix.

UNIT-3

CO-ORDINATE GEOMETRY

Co-ordinate System: Cartesian and Polar, Distance, Division, Area of a triangle, Locus of a point and its equation, Slope of St. Line - Angle between two St. Lines. - Parallel and perpendicular St. Lines, Standard and general equation of St. line. Point of intersection of two st lines.

STATISTICS

Measures of Central tendency (Mean, Mode, Median), Measures of Dispersion (Mean deviation, standard deviation)

UNIT-4

DIFFERENTIAL CALCULUS

Define constant, variable, function, Value of the function, Concept of limit of a function, Definition and concept of differential coefficient as a limit, Standard results, Derivatives of sum, difference, product, quotient of two functions, Diff. coeff. of function of a function, Diff. coeff. of implicit function, Logarithmic Differentiation, Differential coeff. of Parametric function.

INTEGRAL CALCULUS

Definition as a inverse process of differentiation, Standard Results (including inverse function), Methods of Integration - Substitution - Integration by parts - Breaking up into partial fraction, Concept of Definite Integral

UNIT-5

VECTOR ALGEBRA

Concept of Vector and Scalar Quantities, Different types of vectors, Addition and subtraction of vectors, Components of a vector, Multiplication of two vectors

- Scalar Product
- Vector Product
- Applications (Work done, power & reactive power)

REFERENCES

1. Mathematics for Polytechnics Vol. I and II - Prepared by T.T.T.I. Bhopal
2. Differential Calculus - Gorakh Prasad
3. Integral Calculus - Gorakh Prasad
4. Co-ordinate Geometry- S.L. Loni
5. Engineering Mathematics (M.P. Hindi Granth Akadami) - Dr. S.K. Chouksey & Manoj Singh
6. Mathematical Statistics - Ray and Sharma
7. Higher Engineering Mathematics- B.S. Grewal

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SEMESTER: FIRST
COURSE CODE: **105**
NAME OF COURSE: **PROFESSIONAL ACTIVITIES**

RATIONALE

Professional Activities is not a descriptive course, as per conventional norms; therefore specific content for this course cannot be prescribed. It is a group of open-ended activities; where in variety of tasks are to be performed, to achieve objectives. However general guidelines for achieving the target and procedure for its assessment are given under the course content.

As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

OBJECTIVES:

- To allow for professional development of students as per the demand of engineering profession.
- To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
- TO allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
- To provide time for organization of guest lectures by expert engineers/eminent professionals of industry.
- To provide time for organization of technical quiz or group discussion or any other group activity.
- To provide time for visiting library or using Internet.
- To provide time for group discussion or solving case studies.
- To provide time for personality development of students.
- To provide time for working for social cause like awareness for environmental and ecology etc.

DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:

A. Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.

B. This course should be evaluated on the basis of grades and mark sheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities (PA).

C. Following grade scale of evaluation of performance in PA has been established.

Grades	Level of performance
A	Excellent
B	Good
C	Fair

D	Average
E	Below Expectations

D. Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
E. Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the deptt. Concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term. Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.
F. While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programmed of study.
G. Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
H. It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.
I. Compendium shall contain following:
I. Record of written quiz.
II. Report/write up of seminar presented
III. Abstract of the guest lecturers arranged in the Institution.
IV. Topic and outcome of the group discussion held.
V. Report on the problems solved through case studies.
VI. Report on social awareness camps (organized for social and environmental prevention).
VII. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.
J. PA is not a descriptive course to be taught in the classroom by a particular teacher. Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content.
These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development. Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, roll play and simulation to make the development of personality affective.
Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student, among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them, to execute certain activity.