



कार्यालय सचिव राजीव गांधी प्रौद्योगिकी विश्वविद्यालय, भोपाल
पोलीटेक्निक भवन, रा. गा. प्रौ. वि. वि. परिसर, एयरपोर्ट रोड गांधीनगर,
भोपाल-462033 (म.प्र.) दूरभाष- 0755-2600816

क. / रा. गा. प्रौ. वि. वि. / शैक्ष. / 2022 / 1826

भोपाल, दिनांक

18/10/22

प्रति,

प्राचार्य

समस्त सहशिक्षा / महिला / निजी पॉलीटेक्निक महा. (द्वितीय पारी सहित)
मध्य प्रदेश।

विषय :- शैक्षणिक सत्र 2022-23 के प्रथम उपसत्र जुलाई 2022 से प्रारंभ हो रहे प्रथम सेमेस्टर में
AICTE द्वारा विकसित आदर्श पाठ्यक्रम (Model Curriculum) लागू करने विषयक।

संदर्भ :- इस कार्यालय का पत्र क. / रा. गा. प्रौ. वि. वि. / शैक्ष. / 2022 / 1657 भोपाल, दिनांक
19/09/2022 एवं पत्र क. / रा. गा. प्रौ. वि. वि. / शैक्ष. / 2022 / 1711 भोपाल, दिनांक
26/09/2022.

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उपरोक्त विषय एवं संदर्भ में लेख है कि इस कार्यालय के
संदर्भित पत्रों द्वारा डिप्लोमा इंजीनियरिंग की सात ब्रांचों में शैक्षणिक सत्र 2022-23 के जुलाई 2022
से प्रारंभ हो रहे प्रथम शैक्षणिक उपसत्र से AICTE द्वारा विकसित इंजीनियरिंग डिप्लोमा पाठ्यक्रम
लागू किये जाने संबंधी सूचना प्रसारित की गयी थी। इस संबंध में विभिन्न संस्थाओं/शिक्षकों से
पत्र, दूरभाष, वाट्सएप से प्राप्त फीडबैक पर विचार करने के लिये गठित वरिष्ठ प्राचार्यों की समिति
द्वारा निर्णय लिया गया कि AICTE द्वारा विकसित आदर्श पाठ्यक्रम (Model Curriculum)
इंजीनियरिंग डिप्लोमा की निम्नलिखित ब्रांचों में शैक्षणिक सत्र 2022-23 के जुलाई 2022 से प्रारंभ
होने वाले शैक्षणिक उपसत्र के प्रथम सेमेस्टर से समान रूप से लागू किया जाये :-

NAME OF DIPLOMA COURSE
AUTOMOBILE ENGINEERING
CEMENT TECHNOLOGY
CHEMICAL ENGINEERING
CIVIL ENGINEERING
COMPUTER SCIENCE & ENGINEERING
CONSTRUCTION TECHNOLOGY & MANAGEMENT
COMPUTER HARDWARE & MAINTENANCE
ELECTRICAL ENGINEERING

ELECTRONICS & TELECOMMUNICATION ENGINEERING
ELECTRONICS & INSTRUMENTATION
ELECTRICAL & ELECTRONICS ENGINEERING
ELECTRONICS ENGINEERING
INFORMATION TECHNOLOGY
MECHANICAL ENGINEERING
OPTO- ELECTRONICS
REFINERY & PETRO-CHEMICAL ENGINEERING
PLASTIC TECHNOLOGY
PRINTING TECHNOLOGY
PRODUCTION ENGINEERING
RECRIGERATION & A.C. ENGG.
TEXTILE TECHNOLOGY

इससे प्रथम वर्ष (प्रथम तथा द्वितीय सेमेस्टर) के पश्चात ब्रांच परिवर्तन में आने वाली व्यवहारिक कठिनाईयां भी दूर हो सकेंगी।

उपरोक्तानुसार सभी ब्रांचों से संबंधित SCHEME OF STUDIES एवं AICTE द्वारा विकसित प्रथम सेमेस्टर से प्रभावशील एक समान पाठ्यचर्या संलग्न है। विश्वविद्यालय द्वारा इसे शीघ्र ही मानक प्रारूप में उपलब्ध कराया जावेगा।

(माननीय कुलपति जी द्वारा अनुमोदित)



सचिव,
राजीव गांधी प्रौद्योगिकी विश्वविद्यालय,
भोपाल
भोपाल दिनांक

पृ० क्रमांक/रागांप्रौवि/शैक्ष/2022/
प्रतिलिपि:-

1. निज सचिव, माननीय कुलपति जी, राजीव गांधी प्रौद्योगिकी विश्वविद्यालय, भोपाल।
2. आयुक्त, संचालनालय, तकनीकी शिक्षा, म०प्र०, सतपुडा भवन, चतुर्थ तल, भोपाल।
3. कुल सचिव, रागांप्रौवि, गांधी नगर भोपाल की ओर सूचनार्थ अग्रेषित।

- scd

सचिव,
राजीव गांधी प्रौद्योगिकी विश्वविद्यालय
भोपाल



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

Scheme of Studies & Examinations for the FIRST SEMESTER

Implemented from Session: JULY-2022

---: NAME OF THE PROGRAMMES: ---

Automobile, Cement Tech., Chemical, CSE, Civil, CTM, CHM, Electrical, Electronics & Tele., Electronics & Inst., Electrical & Electronics Engg., Electronics Engg., IT, Mechanical, Opto Electronics, PRPC, Plastic Tech., Printing Tech., Production Engg., RAC, Textile Technology

COURSE TITLE	THEORY COMPONENT								PRACTICAL COMPONENT						TOTAL CREDIT	GRAND TOTAL OF MARKS
	LECTURE Hrs. Per Week	TERM WORK QUIZ, ASSIGNMENT	MID TERM TESTS (BEST TWO OUT OF THREE)		THEORY PAPER			THEORY CREDIT	PRACTICAL Hrs. Per Week	CONTINUOUS EVALUATION	END OF THE TERM / SEMESTER EVALUATION			PRACTICAL CREDIT		
			I	II	NO.	MARKS	DURATION (Hrs)				LAB. WORK QUIZ, ASSIGNMENT	PRACTICAL / ORAL EXAMINATION (VIVA)				
										NO.		MARKS	DURATION (Hrs.)			
Mathematics – I	03	10	10	10	01	70	03	03	--	--	--	--	--	03	100	
Applied Physics – I	04	10	10	10	01	70	03	04	04	20	01	30	03	02	06	150
Applied Chemistry	04	10	10	10	01	70	03	04	04	20	01	30	03	02	06	150
Communication Skill in English	03	10	10	10	01	70	03	03	02	20	01	30	03	01	04	100
Engineering Graphics	--	--	--	--	--	--	--	--	04	40	01	60	03	2.0	2.0	100
Engineering Workshop Practice	--	--	--	--	--	--	--	--	04	40	01	60	03	2.0	2.0	100
Sports and Yoga	--	25	25	25	--	--	--	--	02	--	--	--	--	01	01	75
Professional Development - I	--	25	25	25	--	--	--	--	02	--	--	--	--	01	01	75
TOTAL	14							14	22					11	25	

TABLE - I

SEMESTER – I

-: Common to :-

NAME OF DIPLOMA COURSE
AUTOMOBILE ENGINEERING
CEMENT TECHNOLOGY
CHEMICAL ENGINEERING
CIVIL ENGINEERING
COMPUTER SCIENCE & ENGINEERING
CONSTRUCTION TECHNOLOGY & MANAGEMENT
COMPUTER HARDWARE & MAINTENANCE
ELECTRICAL ENGINEERING
ELECTRONICS & TELECOMMUNICATION ENGINEERING
ELECTRONICS & INSTRUMENTATION
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ELECTRONICS ENGINEERING
INFORMATION TECHNOLOGY
MECHANICAL ENGINEERING
OPTO- ELECTRONICS
REFINERY & PETRO-CHEMICAL ENGINEERING
PLASTIC TECHNOLOGY
PRINTING TECHNOLOGY
PRODUCTION ENGINEERING
RECRIGERATION & A.C. ENGG.
TEXTILE TECHNOLOGY

Sl. No	Course Title	Hours per week		Total contact hrs per week	Credits
		LECTURES	PRACTICALS		
1.	Mathematics-I	03	--	03	03
2.	Applied Physics-I	04	04	08	06
3.	Applied Chemistry	04	04	08	06
4.	Communication Skills in English	03	02	05	04
5.	Engineering Graphics	--	04	04	02
6.	Engineering Workshop Practice	--	04	04	02
7.	Sports and Yoga	--	02	02	01
8.	Professional Development - I	--	02	02	01
TOTAL		14	22	36	25

Detailed First Year Curriculum Contents SEMESTER - I

Course Title	:	Mathematics- I
Number of Credits	:	3 (L:3, P: 0)
Prerequisites	;	NIL

Course Objectives:

This course is designed to give a comprehensive coverage at an introductory level to the subject of Trigonometry, Differential Calculus and Basic elements of algebra.

Course Content:

UNIT - I: Trigonometry

Concept of angles, measurement of angles in degrees, grades and radians and their conversions, T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T- Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2). Graphs of $\sin x$, $\cos x$, $\tan x$ and e^x .

Differential Calculus

Definition of function; Concept of limits. Four standard limits $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$, $\lim_{x \rightarrow 0} \frac{\sin x}{x}$,

$$\lim_{x \rightarrow a} \left(\frac{a^x - 1}{x} \right) \text{ and } \lim_{x \rightarrow a} \left(\frac{a^x - 1}{x} \right)$$

Differentiation by definition of x^n , $\sin x$, $\cos x$, $\tan x$, e^x and $\log_a x$. Differentiation of sum, product and quotient of functions. Differentiation of function of a function. Differentiation of trigonometric and inverse trigonometric functions, Logarithmic differentiation, Exponential functions.

UNIT - III: Algebra

Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian, representation of a complex number and its conversion from one form to other, conjugate of a complex number, modulus and amplitude of a complex number Addition, Subtraction, Multiplication and Division of a complex number. De-moivre's theorem, its application.

Partial fractions: Definition of polynomial fraction proper & improper fractions and definition of partial fractions. To resolve proper fraction into partial fraction with denominator containing non-repeated linear factors, repeated linear factors and irreducible non-repeated quadratic factors. To resolve improper fraction into partial fraction.

Permutations and Combinations: Value of ${}^n P_r$ and ${}^n C_r$.

Binomial theorem: Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof) first and second binomial approximation with applications to engineering problems

References:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.
2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.
3. Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (Revised Ed. 2018)
4. V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, Engineering Mathematics, 6/e., Vikas Publishing House.
5. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi

Course Outcomes:

By the end of the course, the students are expected to learn

- (i) The students are expected to acquire necessary background in Trigonometry to appreciate the importance of the geometric study as well as for the calculation and the mathematical analysis.
 - (ii) The ability to find the effects of changing conditions on a system.
 - (iii) Complex numbers enter into studies of physical phenomena in ways that most people cannot imagine.
 - (iv) The partial fraction decomposition lies in the fact that it provides an algorithm for computing the antiderivative of a rational function.
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Course Title	:	Applied Physics –I
Number of Credits	:	4 (L: 4, P: 0)
Prerequisites	:	High School Level Physics

Course Objectives:

Applied Physics includes the study of a large number of diverse topics all related to materials/things that exist in the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which such objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology are given prominence in the course content. The course will help the diploma engineers to apply the basic concepts and principles to solve broad-based engineering problems and to understand different technology based applications.

Teaching Approach:

- Teachers should give examples from daily routine as well as, engineering/technology applications on various concepts and principles in each topic so that students are able to understand and grasp these concepts and principles. In all contents, SI units should be followed.
- Use of demonstration can make the subject interesting and develop scientific temper in the students. Student activities should be planned on all the topics.
- Activity- Theory - Demonstrate/practice approach may be followed throughout the course so that learning may be outcome and employability based.

Course Content:

Unit 1: Physical world, Units and Measurements

Physical quantities; fundamental and derived, Units and systems of units (FPS, CGS and SI units),

Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions, Dimensional equations and their applications (conversion from one system of units to other, checking of dimensional equations and derivation of simple equations), Limitations of dimensional analysis.

Measurements: Need, measuring instruments, least count, types of measurement (direct, indirect), Errors in measurements (systematic and random), absolute error, relative error, error propagation, error estimation and significant figures.

Unit 2: Force and Motion

Scalar and Vector quantities – examples, representation of vector, types of vectors. Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only), Scalar and Vector Product, Resolution of a Vector and its application to inclined plane and lawn roller.

Force, Momentum, Statement and derivation of conservation of linear momentum, its applications such as recoil of gun, rockets, Impulse and its applications.

Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period, Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical), Centripetal and Centrifugal forces with live examples, Expression and applications such as banking of roads and bending of cyclist.

Unit 3: Work, Power and Energy

Work: Concept and units, examples of zero work, positive work and negative work
Friction: concept, types, laws of limiting friction, coefficient of friction, reducing friction and its engineering applications, Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications.

Energy and its units, kinetic energy, gravitational potential energy with examples and derivations, mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples).

Power and its units, power and work relationship, calculation of power (numerical problems).

Unit 4: Rotational Motion

Translational and rotational motions with examples, Definition of torque and angular momentum and their examples, Conservation of angular momentum (quantitative) and its applications.

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

Unit 5: Properties of Matter

Elasticity: definition of stress and strain, moduli of elasticity, Hooke's law, significance of stress-strain curve.

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

Surface tension: concept, units, cohesive and adhesive forces, angle of contact, Ascent Formula (No derivation), applications of surface tension, effect of temperature and impurity on surface tension.

Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems.

Hydrodynamics: Fluid motion, stream line and turbulent flow, Reynold's number Equation of continuity, Bernoulli's Theorem (only formula and numericals) and its applications.

Unit 6: Heat and Thermometry

Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples), specific heats, scales of temperature and their relationship, Types of Thermometer (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses.

Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them, Co-efficient of thermal conductivity, engineering applications.

Learning Outcome:

After undergoing this subject, the student will be able to:

- Identify physical quantities, select their units for use in engineering solutions, and make measurements with accuracy by minimizing different types of errors.
- Represent physical quantities as scalar and vectors and solve real life relevant problems.
- Analyse type of motions and apply the formulation to understand banking of roads/railway tracks and conservation of momentum principle to describe rocket propulsion, recoil of gun etc.
- Define scientific work, energy and power and their units. Drive relationships for work, energy and power and solve related problems.
- Describe forms of friction and methods to minimize friction between different surfaces.
- State the principle of conservation of energy. Identify various forms of energy, and energy transformations.
- Compare and relate physical properties associated with linear motion and rotational motion and apply conservation of angular momentum principle to known problems.
- Describe the phenomenon of surface tension, effects of temperature on surface tension and solve statics problems that involve surface tension related forces.
- Describe the viscosity of liquids, coefficient of viscosity and the various factors affecting its value. Determine viscosity of an unknown fluid using Stokes' Law and the terminal velocity.
- Define stress and strain. State Hooke's law and elastic limits, stress-strain diagram, determine; (a) the modulus of elasticity, (b) the yield strength (c) the tensile strength, and (d) estimate the percent elongation.
- Illustrate the terms; heat and temperature, measure temperature in various processes on different scales (Celsius, Fahrenheit, and Kelvin etc.)
- Distinguish between conduction, convection and radiation; identify different methods for reducing heat losses and mode of heat transfer between bodies at different temperatures.
- State specific heats and measure the specific heat capacity of solids and liquids.

References:

1. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
 2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi.
 3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
 4. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
 5. Engineering Physics by DK Bhattacharya & PoonamTandan; Oxford University Press, New Delhi.
 6. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi
 7. Practical Physics by C. L. Arora, S. Chand Publication.
 8. e-books/e-tools/ learning physics software/websites etc.
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Course Title	:	Applied Chemistry
Number of Credits	:	4 (L: 4, P: 0)
Prerequisites	:	High School Level Chemistry

Course Objectives:

There are numerous number materials are used in fabricating and manufacturing devices for the comfort of life. The selection, characterization and suitability assessment of natural raw materials essentially requires principles and concepts of Applied Chemistry for technicians. On successful completion of this course content will enable technicians to understand, ascertain and analyse and properties of natural raw materials require for producing economical and eco-friendly finished products.

- Solve various engineering problems applying the basic knowledge of atomic structure and chemical bonding.
- Use relevant water treatment method to solve domestic and industrial problems.
- Solve the engineering problems using knowledge of engineering materials and properties.
- Use relevant fuel and lubricants for domestic and industrial applications
- Solve the engineering problems using concept of Electrochemistry and corrosion.

Course Content:

- **Unit 1: Atomic Structure, Chemical Bonding and Solutions**

Rutherford model of atom, Bohr's theory (expression of energy and radius to be omitted), and hydrogen spectrum explanation based on Bohr's model of atom, Heisenberg uncertainty principle, Quantum numbers – orbital concept. Shapes of s,p and d orbitals, Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration.

Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding (NaCl example), covalent bond (H_2 , F_2 , HF hybridization in $BeCl_2$, BF_3 , CH_4 , NH_3 , H_2O), coordination bond in NH_4^+ , and anomalous properties of NH_3 , H_2O due to hydrogen bonding, and metallic bonding.

Solution – idea of solute, solvent and solution, methods to express the concentration of solution- molarity (M = mole per liter), ppm, mass percentage, volume percentage and mole fraction.

- **Unit 2: Water**

Graphical presentation of water distribution on Earth (pie or bar diagram). Classification of soft and hard water based on soap test, salts causing water hardness, unit of hardness and simple numerical on water hardness.

Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion etc), and quantitative measurement of water hardness by EDTA method, total dissolved solids (TDS) alkalinity estimation.

i). Water softening techniques – soda lime process, zeolite process and ion exchange process.

ii). Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.

Water for human consumption for drinking and cooking purposes from any water sources and enlist Indian standard specification of drinking water (collect data and understand standards).

- **Unit 3: Engineering Materials**

Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix), flux, slag, metallurgy – brief account of general principles of metallurgy.

Extraction of - iron from haematite ore using blast furnace, aluminium from bauxite along with reactions. Alloys – definition, purposes of alloying, ferrous alloys and non-ferrous with suitable examples, properties and applications.

General chemical composition, composition based applications (elementary idea only details omitted):

Port land cement and hardening, Glasses Refractory and Composite materials.

Polymers – monomer, homo and co polymers, degree of polymerization, simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using PVC, PS, PTFE, nylon – 6, nylon-6,6 and Bakelite), rubber and vulcanization of rubber.

- **Unit 4: Chemistry of Fuels and Lubricants**

Definition of fuel and combustion of fuel, classification of fuels, calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula.

Proximate analysis of coal solid fuel

petrol and diesel - fuel rating (octane and cetane numbers),

Chemical composition, calorific values and applications of LPG, CNG, water gas, coal gas, producer gas and biogas.

Lubrication – function and characteristic properties of good lubricant, classification with examples, lubrication mechanism – hydrodynamic and boundary lubrication, physical properties (viscosity and viscosity index, oiliness, flash and fire point, cloud and pour point only) and chemical properties (coke number, total acid number saponification value) of lubricants.

- **Unit 5: Electro Chemistry**

Electronic concept of oxidation, reduction and redox reactions.

Definition of terms: electrolytes, non-electrolytes with suitable examples, Faradays laws of electrolysis and simple numerical problems.

Industrial Application of Electrolysis –

- Electrometallurgy
- Electroplating
- Electrolytic refining.

Application of redox reactions in electrochemical cells –

- Primary cells – dry cell,
- Secondary cell - commercially used lead storage battery, fuel and Solar cells.

Introduction to Corrosion of metals –

- definition, types of corrosion (chemical and electrochemical), H₂ liberation and O₂ absorption mechanism of electrochemical corrosion, factors affecting rate of corrosion.

Internal corrosion preventive measures –

- Purification, alloying and heat treatment and

External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors.

Suggested Sessional work:

- **Unit 1: Atomic Structure, Chemical Bonding and Solutions**

Assignments: Writing electronic configuration of elements up to atomic number 30 (Z=30). Numerical on molarity, ppm, mass percentage, volume percentage and mole fraction of given solution.

Seminar: 1. Quantum numbers,

2. Discuss the metallic properties such as malleability, ductility, hardness, high melting point, conductance of heat and electricity, magnetic properties of metals.

Projects: Model of molecules BeCl₂, BF₃, CH₄, NH₃, H₂O.

- **Unit 2: Water**

Assignments: Simple problems on hardness calculation.

Seminar: 1. Quality and quantity requirement of water in house and industry.

2. Quality of control measures of effluents (BOD & COD).

Projects: Collect water samples from different water sources and measure of hardness of water.

- **Unit 3: Engineering Materials**

Assignments: Preparation of table showing different ores of iron, copper and aluminium metals along with their chemical compositions and classify in to oxide sulphide halide ores.

Seminar: Discuss the chemical reactions taking place in blast furnace in extraction of Fe, Cu and Al metals.

Projects: Make table showing place of availability of different ores in India and show places on India map.

- **Unit 4: Chemistry of Fuels and Lubricants**

Assignments: Calculation of HCV and LCV of fuel using fuel composition in Dulong's formula.

Seminar: Chemical structure of fuel components influence on fuel rating.

Projects: Mapping of energy resources in India. Collection of data of various lubricants available in the market.

- **Unit 5: Electro Chemistry**

Assignments: Simple problems on Faradays laws of electrolysis.

Seminar: 1. Corrosion rate and units.

2. Corrosion preventions.

Projects: Mapping of area in India prone to corrosion. Collection of data of various

electrochemical cells batteries used in equipment and devices and available in market. Visit to sites such as Railway station to watch corrosion area in railways and research establishment in and around the institution.

Learning Outcomes

At the end of the course student will be able to

1. Understand the classification and general properties of engineering materials such as metal, alloys, glasses, cement, refractory and composite materials using knowledge of chemical bonding.
2. Understand and assess the suitability of water source for domestic and industrial application, effluents and minimize water pollution.
3. Qualitatively analyze the engineering materials and understand their properties and applications.
4. Choose fuel and lubricants suitable for economical industrial processing to obtain eco-friendly finished products.
5. a) Ascertain construction, mechanism efficiency of electrochemical cells, solar cell fuel cells
b) Understand corrosion and develop economical prevention techniques.

References/Suggested Learning Resources:

(a) Books :

- 1) Text Book of Chemistry for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18.
- 2) Agarwal, & Shikha, Engineering Chemistry, Cambridge University Press; New Delhi, 2015.
- 3) C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.
- 4) Dara, S. S. & Dr.S.S.Umare, Engineering Chemistry, S.Chand. Publication, New Delhi, New Delhi, 2015.
- 5) Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015.
- 6) Dr. Vairam, S., Engineering Chemistry, Wiley India Pvt.Ltd., New Delhi, 2013.
- 7) Dr. G. H. Hugar & Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II, NITTTR, Chandigarh, Publications, 2013-14.
- 8) Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt.Ltd., 2014.

(b) Open source software and website address:

- 1 www.chemguide.co.uk/atommenu.html (Atomic structure and chemical bonding)
 - 2 www.visionlearning.com (Atomic structure and chemical bonding)
 - 3 www.chem1.com (Atomic structure and chemical bonding)
 - 4 <https://www.wastewaterelearning.com/elearning/> (Water Treatment)
 - 5 www.capital-refractories.com (Metals, Alloys, Cement, and Refractory Materials)
 - 6 www.em-ea.org/guide%20books/book-2/2.1%20fuels%20and%20combustion.pdf (Fuel and Combustion)
 - 7 www.chemcollective.org (Metals, Alloys)
 - 8 www.wqa.org(Water Treatment)
-

Course Title	:	Communication Skills in English
Number of Credits	:	3(L:3, P:0)
Prerequisites	:	NIL

Course Objectives:

Communication skills play an important role in career development. This course aims at introducing basic concepts of communication skills with an emphasis on developing personality of the students. Thus, the main objectives of this course are:

To develop confidence in speaking English with correct pronunciation.

To develop communication skills of the students i.e. listening, speaking, reading and writing skills.

To introduce the need for personality development- Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills etc.

Course Content

Unit-1 Communication: Theory and Practice

- Basics of communication: Introduction, meaning and definition, process of communication etc.
- Types of communication: formal and informal, verbal, non-verbal and written Barriers to effective communication.
- 7 Cs for effective communication (considerate, concrete, concise, clear, complete, correct, courteous).
- Art of Effective communication,
 - Choosing words
 - Voice
 - Modulation
 - Clarity
 - Time
 - Simplification of words
- Technical Communication.

Unit-2 Soft Skills for Professional Excellence

- Introduction: Soft Skills and Hard Skills.
- Importance of soft skills.
- Life skills: Self-awareness and Self-analysis, adaptability, resilience, emotional intelligence and empathy etc.
- Applying soft skills across cultures.
- Case Studies.

Unit-3: Reading Comprehension

Comprehension, vocabulary enhancement and grammar exercises based on reading of the following texts:

Section-1

Malgudi Days: R.K. Narayan

The Room on Roof: Ruskin Bond

“The Gift of the Magi” by O. Henry

“Uncle Podger Hangs a Picture” Jerome K. Jerome

Section-2

Night of the Scorpion by Nissim Ezekiel,

Stopping by Woods on a Snowy Evening by Robert Frost,

Where the Mind is Without Fear by Rabindranath Tagore,

Ode to Tomatoes by Pablo Neruda,

Unit-4: Professional Writing

The art of précis writing,

Letters: business and personnel,

Drafting e-mail, notices, minutes of a meeting etc.

Filling-up different forms such as banks and on-line forms for placement etc.

Unit-5: Vocabulary and Grammar

Vocabulary of commonly used words

Glossary of administrative terms (English and Hindi)

One-word substitution, Idioms and phrases etc.

Parts of speech, active and passive voice, tenses etc., Punctuation

References:

1. J.D.O'Connor. *Better English Pronunciation*. Cambridge: Cambridge University Press, 1980.
2. Lindley Murray. *An English Grammar: Comprehending Principles and Rules*. London: Wilson and Sons, 1908.
3. Kulbhushan Kumar, *Effective Communication Skills*, Khanna Publishing House, New Delhi (Revised Edition 2018)
4. Margaret M. Maison. *Examine your English*. Orient Longman: New Delhi, 1964.
5. M. Ashraf Rizvi. *Effective Technical Communication*. Mc-Graw Hill: Delhi, 2002.
6. John Nielson. *Effective Communication Skills*. Xlibris, 2008.
7. *Oxford Dictionary*
8. *Roget's Thesaurus of English Words and Phrases*
9. *Collin's English Dictionary*

Course outcomes:

At the end of this course, the participants will:

- Develop basic speaking and writing skills including proper usage of language and vocabulary so that they can become highly confident and skilled speakers and writers.
- Be informed of the latest trends in basic verbal activities such as presentations, facing interviews and other forms of oral communication.

- Also develop skills of group presentation and communication in team.
- Develop non-verbal communication such as proper use of body language and gestures.

Course Title	:	Engineering Graphics
Number of Credits	:	2.0 (L: 0, P: 4)
Prerequisites	:	NIL

Course Objectives:

- To understand the language of graphics which is used to express ideas, convey instructions while carrying out engineering jobs.
- To develop drafting and sketching skills, to know the applications of drawing equipments, and get familiarize with Indian Standards related to engineering drawings.
- To develop skills to visualize actual object or a part of it, on the basis of drawings.
- To develop skills to translate ideas into sketches and to draw and read various engineering curves, projections and dimensioning styles.
- To understand the basic commands and develop basic skills related to computer aided drafting, of how to draw, modify, and edit basic shapes (2D), using AUTOCAD.

Course Content

Unit – I Basic elements of Drawing

Drawing Instruments and supporting materials: method to use them with applications.

Convention of lines and their applications.

Representative Fractions – reduced, enlarged and full size scales; Engineering Scales such as plain and diagonal scale.

Dimensioning techniques as per SP-46:2003 – types and applications of chain, parallel and coordinate dimensioning.

Geometrical and Tangency constructions. (Redraw the figure)

Unit – II Orthographic projections

Introduction of projections-orthographic, perspective, isometric and oblique: concept and applications. (No question to be asked in examination).

Introduction to orthographic projection, First angle and Third angle method, their symbols.

Conversion of pictorial view into Orthographic Views – object containing plain surfaces, slanting surfaces, slots, ribs, cylindrical surfaces. (use First Angle Projection method only)

Unit – III Isometric Projections

Introduction to isometric projections.

Isometric scale and Natural scale.

Isometric view and isometric projection.

Illustrative problems related to objects containing lines, circles and arcs shape only.

Conversion of orthographic views into isometric view/projection.

Unit – IV Free Hand Sketches of engineering elements

Free hand sketches of machine elements: Thread profiles, nuts, bolts, studs, set screws, washer, Locking arrangements. (For branches other than mechanical Engineering, the teacher should select branch specific elements for free hand sketching)

Free hand sketches of orthographic view (on squared graph paper) and isometric view (on isometric grid paper)

Unit – V Computer aided drafting interface

Computer Aided Drafting: concept.

Hardware and various CAD software available.

System requirements and Understanding the interface.

Components of AutoCAD software window: Title bar, standard tool bar, menu bar, object properties tool bar, draw tool bar, modify tool bar, cursor cross hair. Command window, status bar, drawing area, UCS icon.

File features: New file, Saving the file, Opening an existing drawing file, Creating templates, Quit.

Setting up new drawing: Units, Limits, Grid, Snap.

Undoing and redoing action.

Unit – VI Computer aided drafting

Draw basic entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline, PolyLine.

Method of Specifying points: Absolute coordinates, Relative Cartesian and Polar coordinates.

Modify and edit commands like trim, extend, delete, copy, offset, array, block, layers.

Dimensioning: Linear, Horizontal Vertical, Aligned, Rotated, Baseline, Continuous, Diameter, Radius, Angular Dimensions.

Dim scale variable.

Editing dimensions.

Text: Single line Text, Multiline text.

Standard sizes of sheet. Selecting Various plotting parameters such as Paper size, paper units, Drawing orientation, plot scale, plot offset, plot area, print preview.

S. No.	Practical Exercises	Unit No.	Ap- prox. Hrs
1	Draw horizontal, Vertical, 30 degree, 45 degree, 60 and 75 degrees lines, different types of lines, dimensioning styles using Tee and Set squares/ drafter. (do this exercise in sketch book)	I	02
2	Write alphabets and numerical (Vertical only) (do this exercise in sketch book)	I	02

3	Draw regular geometric constructions and redraw the given figure (do this exercise in sketch book) Part I	II	02
4	Draw regular geometric construction and redraw the given figure (do this exercise in sketch book) Part II	II	02
5	Draw a problem on orthographic projections using first angle method of projection having plain surfaces and slanting. Part I	III	02
6	Draw another problem on orthographic projections using first angle method of projection having slanting surfaces with slots. Part II	III	02
7	Draw two problems on orthographic projections using first angle method of projection having cylindrical surfaces, ribs. Part I	III	02
8	Draw two problems on Isometric view of simple objects having plain and slanting surface by using natural scale. Part I	IV	02
9	Draw some problems on Isometric projection of simple objects having cylindrical surface by using isometric scale. Part I	IV	02
10	Draw free hand sketches/ conventional representation of machine elements in sketch book such as thread profiles, nuts, bolts, studs, set screws, washers, Locking arrangements. Part I	V	02
11	Problem based Learning: Given the orthographic views of at least three objects with few missing lines, the student will try to imagine the corresponding objects, complete the views and draw these views in sketch book. Part I	III, II, V	02
12	Draw basic 2D entities like: Rectangle, Rhombus, Polygon using AutoCAD (Print out should be a part of progressive assessment). Part I	V	02
13	Draw basic 2D entities like: Circles, Arcs, circular using AutoCAD (Printout should be a part of progressive assessment). Part II	V	02
14	Draw basic 2D entities like: Circular and rectangular array using AutoCAD (Printout should be a part of progressive assessment). Part III	V	02

15	Draw blocks of 2D entities comprises of Rectangle, Rhombus, Polygon, Circles, Arcs, circular and rectangular array, blocks using AutoCAD (Print out should be a part of progressive assessment). Part IV	V	02
16	Draw basic branch specific components in 2D using AutoCAD (Print out should be a part of term work). Part I	VI	02
17	Draw complex branch specific components in 2D using AutoCAD (Print should be a part of progressive assessment). Part I	VI	02
Total			34

SUGGESTED LEARNING RESOURCES

1. Bureau of Indian Standards. *Engineering Drawing Practice for Schools and Colleges IS: Sp-46*. BIS. Government of India, Third Reprint, October 1998; ISBN: 81-7061-091-2.
2. Bhatt, N. D. *Engineering Drawing*. Charotar Publishing House, Anand, Gujrat 2010; ISBN: 978-93-80358-17-8.
3. Jain & Gautam, *Engineering Graphics & Design*, Khanna Publishing House, New Delhi (ISBN: 978-93-86173-478)
4. Jolhe, D. A. *Engineering Drawing*. Tata McGraw Hill Edu. New Delhi, 2010; ISBN: 978-0-07-064837-1
5. Dhawan, R. K. *Engineering Drawing*. S. Chand and Company, New Delhi; ISBN: 81-219-1431-0.
6. Shah, P. J. *Engineering Drawing*. S. Chand and Company, New Delhi, 2008, ISBN:81-219-2964-4.
7. Kulkarni, D. M.; Rastogi, A. P.; Sarkar, A. K. *Engineering Graphics with AutoCAD*. PHI Learning Private Limited-New Delhi (2010); ISBN: 978-8120337831.

8. Jeyapoovan, T. *Essentials of Engineering Drawing and Graphics using AutoCAD*. Vikas Publishing House Pvt. Ltd, Noida, 2011; ISBN: 978-8125953005.
9. Autodesk. *AutoCAD User Guide*. Autodesk Press, USA, 2015.
10. Sham, Tickoo. *AutoCAD 2016 for Engineers and Designers*. Dreamtech Press; Galgotia Publication, New Delhi, 2015; ISBN 978-9351199113.

Software/Learning Websites

1. <https://www.youtube.com/watch?v=TJ4jGyD-WCw>
2. https://www.youtube.com/watch?v=dmt6_n7Sgcg
3. <https://www.youtube.com/watch?v=MQScnLXL0M>
4. <https://www.youtube.com/watch?v=3WXPanCq9LI>
5. <https://www.youtube.com/watch?v=fvjk7PlxAuo>
6. <http://www.me.umn.edu/coursesme2011/handouts/engg%20graphics.pdf>
7. <https://www.machinedesignonline.com>

Course Outcomes

Following outcomes will be achieved:

- 1) Select and construct appropriate drawing scales, use drawing equipment's, and understand Indian Standards of engineering drawing
 - 2) Draw views of given object and components 3) Sketch orthographic projections into isometric projections and vice versa.
 - 3) Apply computer aided drafting tools to create 2D engineering drawings
-

Course Title	:	Engineering Workshop Practice
Number of Credits	:	2.0 (L: 0, , P: 4)
Prerequisites	:	NIL

Course Objectives:

- To understand basic engineering processes for manufacturing and assembly.
- To understand, identify, select and use various marking, measuring, and holding, striking and cutting tools and equipment's
- To understand and interpret job drawings, produce jobs, and inspect the job for specified dimensions
- To understand the various types of wiring systems and acquire skills in house wiring
- To understand, operate, control different machines and equipment's adopting safety practices

Course Content:

S.No.	Details Of Practical Content
I	Carpentry: i) Demonstration of different wood working tools / machines. ii) Demonstration of different wood working processes, like planing, marking, chiseling, grooving, turning of wood etc. iii) One simple job involving any one joint like mortise and tenon dovetail, bridle, half lap etc.
II	Fitting: i) Demonstration of different fitting tools and drilling machines and power tools ii) Demonstration of different operations like chipping, filing, drilling, tapping, sawing, cutting etc. iii) One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc
III	Welding: i) Demonstration of different welding tools / machines. ii) Demonstration on Arc Welding, Gas Welding, MIG, MAG welding, gas cutting and rebuilding of broken parts with welding. iii) One simple job involving butt and lap joint
IV	Sheet Metal Working: i) Demonstration of different sheet metal tools / machines. ii) Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering, brazing, and riveting. iii) One simple job involving sheet metal operations and soldering and riveting.
V	Electrical House Wiring: Practice on simple lamp circuits (i) one lamp controlled by one switch by surface conduit wiring, (ii) Lamp circuits- connection of lamp and socket by separate switches, (iii) Connection of Fluorescent lamp/tube light, (iv) simple lamp circuits-in-stall bedroom lighting. And (v) Simple lamp circuits- install stair case wiring.

VI	Demonstration: i) Demonstration of measurement of Current, Voltage, Power and Energy. ii) Demonstration of advance power tools, pneumatic tools, electrical wiring tools and accessories. iii) Tools for Cutting and drilling
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References:

1. S.K. Hajara Chaudhary, Workshop Technology, Media Promoters and Publishers, New Delhi, 2015
2. B.S. Raghuvanshi, Workshop Technology, Dhanpat Rai and sons, New Delhi 2014
3. K. Venkat Reddy, Workshop Practice Manual, BS Publications, Hyderabad 2014
4. Kents Mechanical Engineering Hand book, John Wiley and Sons, New York

Course outcomes

At the end of the course, the student will be able to:

CO1	Acquire skills in basic engineering practice to identify, select and use various marking, measuring, and holding, striking and cutting tools & equipment's and machines
CO2	Understand job drawing and complete jobs as per specifications in allotted time
CO3	Inspect the job for the desired dimensions and shape
CO4	Operate, control different machines and equipment's adopting safety practices



Course Title	:	Applied Physics-I Labs
Number of Credits	:	2 (L: 0, P: 4)
Prerequisites	:	NIL

Course Objectives

Study of Applied Physics aims to give an understanding of physical world by observations and predictions. Concrete use of physical principles and analysis in various fields of engineering and technology is very prominent. The course aims to supplement the factual knowledge gained in the lecture by first hand manipulation of apparatus. This will develop scientific temper and help to apply the basic concepts and principles in solving engineering and technology based problems. In addition, students get necessary confidence in handling equipment and thus learn various skills in measurement.

List of Practical's/Activities (To perform minimum 10 practical's).

1. To measure length, radius of a given cylinder, a test tube and a beaker using a Vernier caliper and find volume of each object.
2. To determine diameter of a wire, a solid ball and thickness of cardboard using a screw gauge.
3. To determine radius of curvature of a convex and a concave mirror/surface using a spherometer.
4. To verify triangle and parallelogram law of forces.
5. To find the co-efficient of friction between wood and glass using a horizontal board.
6. To determine force constant of a spring using Hook's Law.
7. To verify law of conservation of mechanical energy (PE to KE).
8. To find the moment of inertia of a flywheel.
9. To find the viscosity of a given liquid (Glycerin) by Stoke's law.
10. To find the coefficient of linear expansion of the material of a rod.
11. To determine atmospheric pressure at a place using Fortin's barometer.
12. To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.

Learning Outcome:

After undergoing this lab work, the student will be able to:

- Select right kind of measuring tools (Meter scale, Vernier caliper, Screw gauge, Spherometer etc.) for determining dimensions of physical quantities and make measurements with accuracy and precision.
- Differentiate various shapes and determine dimensions of plane, curved and regular surfaces/bodies.
- Apply and Verify laws of forces and determine resultant force acting on a body.
- Appreciate role of friction and measure co-efficient of friction between different surfaces.
- Describe and verify Hook's law and determine force constant of spring body.
- Identify various forms of energy, energy transformations and verify law of conservation of energy.
- Understand rotational motion and determine M.I. of a rotating body (flywheel)
- Understand Stoke's law for viscous liquids and determine viscosity of a given liquid.
- Understand how materials expand on heating and determine linear expansion coefficient for a given material rod.
- Understand working and use Fortin's barometers for determining pressure at a place.
- Understand use of thermometers to measure temperature under different conditions and different scales of temperature measurements.

SUGGESTED STUDENT ACTIVITIES & STRATEGIES

Apart from classroom and laboratory learning following are the suggested student related activities which can be undertaken to accelerate the attainment of various outcomes of the course

- a. Make survey of different physical products and compare the following points
 - Measurements of dimensions
 - Properties
 - Applications
- b. Library survey regarding engineering materials/products used in different industries
- c. Seminar on any relevant topic.

Teachers should use the following strategies to achieve the various outcomes of the course.

- Different methods of teaching and media to be used to attain classroom attention.
- Massive open online courses (MOOCs) may be used to teach various topics/sub topics.
- 15-20% of the topics which are relatively simpler or descriptive in nature should be given to the students for self-learning and assess the development of competency through classroom presentations.
- Micro-projects may be given to group of students for hand-on experiences.

References:

1. Text Book of Physics for Class XI & XII (Part-I, Part-II); N.C.E.R.T., Delhi
 2. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P)Ltd.,
 3. Practical Physics by C. L. Arora, S. Chand Publication.
 4. e-books/e-tools/learning physics software/YouTube videos/websites etc.
-

Course Title	:	Applied Chemistry Lab
Number of Credits	:	2 (L: 0, P: 4)
Prerequisites	:	NIL

Course Objectives:

There are numerous number of materials used in fabricating and manufacturing devices for the comfort of life. The selection, characterization and suitability assessment of natural raw materials essentially requires principles and concepts of Applied Chemistry for technicians. The course aims to supplement the factual knowledge gained in the lectures by first hand manipulation of processes and apparatus. This will develop scientific temper and help to apply the basic concepts and principles in solving engineering problems.

LIST OF PRACTICALS:

Perform any 12 (twelve) Laboratory Practicals.

Volumetric and Gravimetric analysis:

- 1 Preparation of standard solution of oxalic acid or potassium permanganate.
- 2 To determine strength of given sodium hydroxide solution by titrating against standard oxalic acid solution using phenolphthalein indicator.
- 3 Standardization of KMnO_4 solution using standard oxalic acid and Determine the percentage of iron present in given Hematite ore by KMnO_4 solution.
- 4 Iodometric estimation of copper in the copper pyrite ore.
- 5 Volumetric estimation of total acid number (TAN) of given oil.
- 6 Volumetric estimation of
 - a) Total hardness of given water sample using standard EDTA solution.
 - b) Alkalinity of given water sample using 0.01M sulphuric acid
- 7 Proximate analysis of coal
 - a) Gravimetric estimation moisture in given coal sample
 - b) Gravimetric estimation ash in given coal sample

Instrumental analysis

8. Determine the conductivity of given water sample.
9. Determination of the Iron content in given cement sample using colorimeter.
10. Determination of calorific value of solid or liquid fuel using bomb calorimeter.
11. Determination of viscosity of lubricating oil using Redwood viscometer.
12. Determination of flash and fire point of lubricating oil using Able's flash point apparatus.
13. To verify the first law of electrolysis of copper sulfate using copper electrode.
14. Construction and measurement of emf of electrochemical cell (Daniel cell).
15. To study the effect of dissimilar metal combination.

Teachers should use the following strategies to achieve the various outcomes of the course.

- Different methods of teaching and media to be used to attain classroom attention.
- Massive open online courses (MOOCs) may be used to teach various topics/sub topics.
- 15-20% of the topics which are relatively simpler or descriptive in nature should be given to the students for self-learning and assess the development of competency through classroom presentations.
- Micro-projects may be given to group of students for hand-on experiences
- Encouraging students to visit to sites such as Railway station and research establishment around the institution.

Learning Outcomes:

At the end of the course student will be able to

- To express quantitative measurements accurately.
- To practice and adapt good measuring techniques.
- To use various apparatus for precise measurements.
- To understand and differentiate different methods of quantitative analysis.
- To know and understand principles of quantitative analysis using instruments.
- To construct different electrochemical cells used in developing batteries.
- To understand and appreciate methods of corrosion abatement.

Reference Books:

1. Text Book of Chemistry for Class XI & XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18.
 2. Dr. G. H. Hugar and Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II, NITTTTR, Chandigarh, Publications, 2013-14.
 3. Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt.Ltd., 2014.
 4. Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015.
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Course Title	:	Sports and Yoga
Number of Credits	:	1(L:0,P:2)
Prerequisites	:	NIL

Course Objectives:

- To make the students understand the importance of sound health and fitness principles as they relate to better health.
- To expose the students to a variety of physical and yogic activities aimed at stimulating their continued inquiry about Yoga, physical education, health and fitness.
- To create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize risk of injury.
- To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.

Course Content:

- **Introduction to Physical Education**
 - Meaning & definition of Physical Education
 - Aims & Objectives of Physical Education
 - Changing trends in Physical Education
- **Olympic Movement**
 - Ancient & Modern Olympics (Summer & Winter)
 - Olympic Symbols, Ideals, Objectives & Values
 - Awards and Honours in the field of Sports in India (Dronacharya Award, Arjuna Award, Dhyanchand Award, Rajiv Gandhi Khel Ratna Award etc.)
- **Physical Fitness, Wellness & Lifestyle**
 - Meaning & Importance of Physical Fitness & Wellness
 - Components of Physical fitness
 - Components of Health related fitness

- Components of wellness
- Preventing Health Threats through Lifestyle Change
- Concept of Positive Lifestyle
- **Fundamentals of Anatomy & Physiology in Physical Education, Sports and Yoga**
 - Define Anatomy, Physiology & Its Importance
 - Effect of exercise on the functioning of Various Body Systems. (Circulatory System, Respiratory System, Neuro-Muscular System etc.)
- **Kinesiology, Biomechanics & Sports**
 - Meaning & Importance of Kinesiology & Biomechanics in Physical Edu. & Sports
 - Newton's Law of Motion & its application in sports.
 - Friction and its effects in Sports.
- **Postures**
 - Meaning and Concept of Postures.
 - Causes of Bad Posture.
 - Advantages & disadvantages of weight training.
 - Concept & advantages of Correct Posture.
 - Common Postural Deformities – Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scoliosis.
 - Corrective Measures for Postural Deformities
- **Yoga**
 - Meaning & Importance of Yoga
 - Elements of Yoga
 - Introduction - Asanas, Pranayama, Meditation & Yogic Kriyas
 - Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankasana)
 - Relaxation Techniques for improving concentration - Yog-nidra
- **Yoga & Lifestyle**
 - Asanas as preventive measures.
 - Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Shavasana.
 - Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana.
 - Back Pain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana.
 - Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana.
 - Asthma: Procedure, Benefits & contraindications for Sukhasana, Chakrasana,

Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana.

- **Training and Planning in Sports**

- Meaning of Training
- Warming up and limbering down
- Skill, Technique & Style
- Meaning and Objectives of Planning.
- Tournament – Knock-Out, League/Round Robin & Combination.

- **Psychology & Sports**

- Definition & Importance of Psychology in Physical Edu. & Sports
- Define & Differentiate Between Growth & Development
- Adolescent Problems & Their Management
- Emotion: Concept, Type & Controlling of emotions
- Meaning, Concept & Types of Aggressions in Sports.
- Psychological benefits of exercise.
- Anxiety & Fear and its effects on Sports Performance.
- Motivation, its type & techniques.
 - Understanding Stress & Coping Strategies.
 - Doping
 - Meaning and Concept of Doping
 - Prohibited Substances & Methods
 - Side Effects of Prohibited Substances

- **Sports Medicine**

- First Aid – Definition, Aims & Objectives.
- Sports injuries: Classification, Causes & Prevention.
- Management of Injuries: Soft Tissue Injuries and Bone & Joint Injuries

- **Sports / Games**

Following sub topics related to any one Game/Sport of choice of student out of: Athletics, Badminton, Basketball, Chess, Cricket, Kabaddi, Lawn Tennis, Swimming, Table Tennis, Volleyball, Yoga etc.

- History of the Game/Sport.
- Latest General Rules of the Game/Sport.
- Specifications of Play Fields and Related Sports Equipment.
- Important Tournaments and Venues.
- Sports Personalities.
- Proper Sports Gear and its Importance.

References:

1. Modern Trends and Physical Education by Prof. Ajmer Singh.

2. Light On Yoga By B.K.S. Iyengar.
3. Health and Physical Education – NCERT (11th and 12th Classes)

Course Outcomes:

On successful completion of the course the students will be able to:

- (i) Practice Physical activities and Hatha Yoga focusing on yoga for strength, flexibility, and relaxation.
 - (ii) Learn techniques for increasing concentration and decreasing anxiety which leads to stronger academic performance.
 - (iii) Learn breathing exercises and healthy fitness activities
 - (iv) Understand basic skills associated with yoga and physical activities including strength and flexibility, balance and coordination.
 - (v) Perform yoga movements in various combination and forms.
 - (vi) Assess current personal fitness levels.
 - (vii) Identify opportunities for participation in yoga and sports activities.
 - (viii) Develop understanding of health-related fitness components: cardiorespiratory endurance, flexibility and body composition etc.
 - (ix) Improve personal fitness through participation in sports and yogic activities.
 - (x) Develop understanding of psychological problems associated with the age and lifestyle.
-
- (xi) Demonstrate an understanding of sound nutritional practices as related to health and physical performance.
 - (xii) Assess yoga activities in terms of fitness value.
 - (xiii) Identify and apply injury prevention principles related to yoga and physical fitness activities.
 - (xiv) Understand and correctly apply biomechanical and physiological principles related to exercise and training.
-

Course Title	:	Communication Skills in English - Lab
Number of Credits	:	1 (L: 0, P: 2)
Prerequisites	:	NIL

Course Objectives:

Communication skills play an important role in career development. This lab course aims at actively involving students in various activities to improve their communication skills with an emphasis on developing personality of the students. Thus, the objectives of this course are:

1. To develop listening skills for enhancing communication.
2. To develop speaking skills with a focus on correct pronunciation and fluency.
3. To introduce the need for Personality development- Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills etc. for that purpose group discussion, extempore and other activities should be conducted during lab classes.

Course Content:

Unit 1 Listening Skills

Listening Process and Practice: Introduction to recorded lectures, poems, interviews and speeches, listening tests.

Unit II Introduction to Phonetics

Sounds: consonant, vowel, diphthongs, etc. transcription of words (IPA), weak forms, syllable division, word stress, intonation, voice etc.

Unit III Speaking Skills

Standard and formal speech: Group discussion, oral presentations, public speaking, business presentations etc. Conversation practice and role playing, mock interviews etc.

Unit IV Building vocabulary

Etymological study of words and construction of words, phrasal verbs, foreign phrases, idioms and phrases. Jargon/ Register related to organizational set up, word exercises and word games to enhance self-expression and vocabulary of participants.

Recommended Readings:

1. Daniel Jones. *The Pronunciation of English*. Cambridge: Cambridge University Press, 1956.
2. James Hartman & et al. Ed. *English Pronouncing Dictionary*. Cambridge: Cambridge University

Press, 2006.

3. Kulbhushan Kumar, *Effective Communication Skills*, Khanna Publishing House, New Delhi (Revised Ed. 2018)
4. J.D.O'Connor. *Better English Pronunciation*. Cambridge: Cambridge University Press, 1980.
5. Lindley Murray. *An English Grammar: Comprehending Principles and Rules*. London: Wilson and Sons, 1908.
6. Margaret M. Maison. *Examine your English*. Orient Longman: New Delhi, 1964.
7. J.Sethi & et al. *A Practice Course in English Pronunciation*. New Delhi: Prentice Hall, 2004.
8. Pfeiffer, William Sanborn and T.V.S Padmaja. *Technical Communication: A Practical Approach*. 6th ed. Delhi: Pearson, 2007.

Learning Outcome:

- At the end of this course the students will be able to communicate effectively with an increase in their confidence to read, write and speak English fluently.
- They will also demonstrate a significant increase in word power.
- The variety of exercises and activities that will be conducted in the Language Lab will develop their skills needed to participate in a conversation like listening carefully and respectfully to others' viewpoints; articulating their own ideas and questions clearly and over all students will be able to prepare, organize, and deliver an engaging oral presentation.
- They will also develop non-verbal communication such as proper use of body language and gestures.

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/3
Branch	ALL BRANCHES			Semester	FIRST
Course Code	PROFESSIONAL DEVELOPMENT -I				
Course Outcome 1	Student will be able to work as a team member			Teach Hrs	Marks
Learning Outcome 1	Student will be able to perform as a team member in a team for organizing vishvakarma pooja/ cultural programme/ departmental plantation programme/ departmental cleanliness drive/ celebration of jayantis of great leaders and personalities			10	10
Contents	Teams, purpose of forming teams, team working, role of team member, certain skills of good team member				
Method of Assessment	Observation + Rating list Administration				
Learning Outcome 2	Student will be able to perform as a team member in team for the publication of departmental newsletter / magazine /other departmental academic events/ functions			10	10
Contents	Teams, purpose of forming teams, team working, role of team member, certain skills of good team member				
Method of Assessment	Observation + Rating list Administration				
Course Outcome 2	Student will be able to communicate non-verbally in a given problem situation				
Learning Outcome 1	Student will be able to communicate through face expressions in a given problem situation			10	10
Contents	Communication, nonverbal communication, its importance, communication through face expressions, various types of face expressions for different messages				
Method of Assessment	Observation + Rating list Administration				
Learning Outcome 2	Student will be able to communicate through body language/ etiquettes in a given problem situation			10	10
Contents	Nonverbal communication, its importance, communication through body language, various types of body expressions for different messages, antiquates & their importance				

Method of Assessment	Observation + Rating list Administration
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Course Outcome -3	Student will be able to make decision in a given professional situation		
Learning Outcome 1	Student will be able to identify the decision to be made in the given case	10	10
Contents	Importance of decisions, need of decision making in professional life, identification of situations which needs decision making, identification of decision to be made		
Method of Assessment	Paper pen test		
Learning Outcome 2	Student will be able to take decision in the given case situation	10	10
Contents	Decision making process, identification of various available alternatives,evaluation of alternatives, selection of best possible alternative		
Method of Assessment	Paper pen test		

RGPV (Diploma Wing) Bhopal		Scheme for Learning Outcome		Branch Code			Course Code			CO Code	LO Code	Format No. 4
							1	0	5	1	1	
COURSE NAME	PROFESSIONAL DEVELOPMENT-1											
CO Description	Student will be able to work as a team member											
LO Description	Student will be able to perform as a team member in a team for organizing vishvakarma pooja/ cultural programme/ departmental plantation programme/ departmental cleanliness drive/ celebration of jayantis of great leaders and personalities											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process				Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks		
1	Teams, purpose of forming teams, team working, role of team member, certain skills of good team member	Traditional Lecture+ Student Activity	Teacher will explain the terms mentioned in content, demonstrate the role and following skills of team member, arrange guided practice for playing role of team member in a team event, arrange formative assessment and tutorials				05	05	Any suitable skill training book on team working, handout	If necessary teacher may also suggest video film or other online learning resources		
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment				Maximum Marks	Resources Required			External / Internal		

1	Observation + Rating list Administratio n	In a team event of small group of student, extentof demonstration of the related skills by the student will be observed and assessed through rating list.	10	Rating List	Internal
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**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY
(IF ANY)**

The team skills :-

- 1. Encourage other team members for ideas and opinions about team activities**
- 2. Active participation in team activities**
- 3. Bears responsibility for the tasks assigned to him/her**
- 4. Try to perform in best way for the assigned team activity**
- 5. Prefer to execute the assigned work than mere discussion on team**

activitiesPerformance indicators:-

1. Respect ideas and opinions of other team members (2 marks)
2. Participate actively in all team activities (2 marks)
3. Sincerely completes tasks assigned to him/ her (2 marks)
4. Shows skills and ability to use available resources to achieve best possible results (2 marks)
5. Try to turn talks into practical solutions and actions with positive impact (2 marks)

Advice: - Form three batches B1, B2 and B3 of students. Assign teaching -learning of the three COs to three faculties F1, F2 and F3 of the department. Conduction of classes will be as per the following matrix:-

	FIRST 20 PERIODS	SECOND 20 PERIODS	THIRD 20 PERIODS
F1 for CO1 (LO1 &LO2)	B1	B2	B3
F2 for CO2 (LO1 & LO2)	B2	B3	B1

	F3 for C03 (L01 & L02)	B3	B1	B2	
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RGPV (Diploma Wing) Bhopal		Scheme for Learning Outcome			Branch Code			Course Code			CO Code	LO Code	Format No. 4
								1	0	5	1	2	
COURSE NAME	PROFESSIONAL DEVELOPMENT-1												
CO Description	Student will be able to work as a team member												
LO Description	Student will be able to perform as a team member in team for the publication of departmental newsletter / magazine /other departmental academic events/ functions												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching- Learning Method	Method of teaching					Teach Hrs.	Pract. /Tut Hrs.	LRs Require d	Remarks		
1	Teams, purpose of forming teams,team working, role of team member, certain skills of good team member	Traditional Lecture +Student Activity	Teacher will recall and if necessary, re-explain the terms mentioned in content, demonstrate the role and following skills of team member, arrange guided practice for playing role of team member in a team event, arrange formative assessment and tutorials					03	07	Any suitable skill training book on team working, handout	If necessary teacher may also suggest video film or other online learning resources		
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal		

1	Observation + Rating list Administratio n	In a team event of small group of student, extentof demonstration of the related skills by the student will be observed and assessed through rating list.	10	Rating List	Internal
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**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY
(IF ANY)**

The team skills:-

- 1. Contributes in solving team work related problems**
- 2. Use his skills and abilities for carrying out team activities**
- 3. Participates in team activities with a positive attitude**
- 4. Cares for genuine concerns of other team members**
- 5. Allows other members to share their views in team and cooperate them in team activities**

Performance indicators:-

1. Offers workable solutions to problems faced by the team (2 marks)
2. Shows skills and ability to be resourceful in a team (2 marks)
3. Active participation in all team activities with a display of winning attitude (2 marks)
4. Questions team's efforts for common benefits of all members (2 marks)
5. Patient listener to other's ideas and opinions (2 marks)

Advice: - Form three batches B1, B2 and B3 of students. Assign teaching -learning of the three COs to three faculties F1, F2 and F3 of the department. Conduction of classes will be as per the following matrix:-

	FIRST 20 PERIODS	SECOND 20 PERIODS	THIRD 20 PERIODS
F1 for C01(L01 &L02)	B1	B2	B3
F2 for C02 (L01 & L02)	B2	B3	B1

F3 for CO3 (L01 & L02)	B3	B1	B2
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RGPV (Diploma Wing) Bhopal	Scheme for Learning Outcome	Branch Code			Course Code			CO Code	LO Code	Format No. 4
					1	0	5	2	1	

COURSE NAME PROFESSIONAL DEVELOPMENT-1

CO Description Student will be able to communicate non-verbally in a given problem situation

LO Description Student will be able to communicate through face expressions in a given problem situation

SCHEME OF STUDY

S. No.	Learning Content	Teaching-Learning Method	Description of T-L process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Communication, nonverbal communication, its importance, communication through face expressions, various types of face expressions for different messages	Traditional lecture + Student Activity	Teacher will explain the terms mentioned in content, demonstrate popular face expressions for messaging, conduct guided practice for communication through face expression under given conditions, conduct formative assessments and remedial /tutorials	05	05	Any suitable training book on non-verbal communication, ,handout	If necessary teacher may also suggest video film or other online learning resources

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
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1	Observation + Rating list Administration	Individual student will be asked to demonstrate at least five communications through appropriate face expressions in given different problem situations, correctness of face expression will be observed and assessed through the rating list.	10	Rating List	Internal
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

Performance indicators:-

1. Correctness of first face expression according to given situation (2marks)
2. Correctness of second face expression according to given situation (2marks)
3. Correctness of third face expression according to given situation (2marks)
4. Correctness of fourth face expression according to given situation (2marks)
5. Correctness of fifth face expression according to given situation (2marks)

Advice: - Form three batches B1, B2 and B3 of students. Assign teaching -learning of the three COs to three faculties F1, F2 and F3 of the department. Conduction of classes will be as per the following matrix:-

	FIRST 20 PERIODS	SECOND 20 PERIODS	THIRD 20 PERIODS
F1 for CO1(L01 &L02)	B1	B2	B3
F2 for CO2 (L01 & L02)	B2	B3	B1
F3 for CO3 (L01 & L02)	B3	B1	B2

RGPV (Diploma Wing) Bhopal		Scheme for Learning Outcome			Branch Code			Course Code			CO Code	LO Code	Format No. 4
								1	0	5	2	2	
COURSE NAME	PROFESSIONAL DEVELOPMENT-1												
CO Description	Student will be able to communicate non-verbally in a given problem situation												
LO Description	Student will be able to communicate through body language/ etiquettes in a given problem situation												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process				Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks			
1	Nonverbal communication, its importance, communication through body language, various types of body expressions for different messages, antiquates & their importance	Traditional Lecture + Student Activity	Teacher will explain the terms mentioned in content, Demonstrate popular body expressions for messaging and antiquates, conduct guided practice for communication through body expression under given conditions, conduct formative assessment and remedial / tutorials				05	05	Any suitable training book on non-verbal communication, handout	If necessary teacher may also suggest video film or other online learning resources			
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment				Maximum Marks	Resources Required		External / Internal				
1	Observation + Rating list Administration	Individual student will be asked to demonstrate at least five communications through appropriate body expressions in given different problem situations, correctness of body expression will				10	Rating List		Internal				

		be observed and assessed through rating list.			
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ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					
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Performance indicators:-

1. Correctness of first body expression according to given situation (2marks)

2. Correctness of second body expression according to given situation (2marks)
3. Correctness of third body expression according to given situation (2marks)
4. Correctness of fourth body expression according to given situation (2marks)
5. Correctness of fifth body expression according to given situation (2marks)

Advice: - Form three batches B1, B2 and B3 of students. Assign teaching -learning of the three COs to three faculties F1, F2 and F3 of the department. Conduction of classes will be as per the following matrix:-

	FIRST 20 PERIODS	SECOND 20 PERIODS	THIRD 20 PERIODS
F1 for C01(L01 &L02)	B1	B2	B3
F2 for C02 (L01 & L02)	B2	B3	B1
F3 for C03 (L01 & L02)	B3	B1	B2

RGPV (Diploma Wing) Bhopal	Scheme for Learning Outcome	Branch Code			Course Code			CO Code	LO Code	Format No. 4
					1	0	5	3	1	

COURSE NAME	PROFESSIONAL DEVELOPMENT-1
CO Description	Student will be able to make decision in a given professional situation
LO Description	Student will be able to identify the decision to be made in the given case

SCHEME OF STUDY

S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Importance of decisions, need of decision making in professional life, identification of situations which needs decision making, identification of decision to be made	Traditional Lecture	Teacher will explain the terms mentioned in content, demonstrate the way to identify the simple situations which needs decision making and identification of decision to be made, guided practice, formative assessment and remedial /tutorials	05	05	Any suitable training book on decision making, handout	If necessary teacher may also suggest video film or other online learning material

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	1. Student will be asked to spot the four cases that need decision making within the different eight given simple cases. 2. Student will be asked to identify the decisions to be made in	10	Test paper, Rating Scale	Internal

		given three simple cases			
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**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY
(IF ANY)**

Decision making - It is process of identifying and evaluating the available alternatives and choosing the most valued alternative.

Performance indicators:-

1. Correct identification of the cases which need decision making (4marks)
2. Correct identification of the decisions to be made in the given cases (6 marks)

Advice: - Form three batches B1, B2 and B3 of students. Assign teaching -learning of the three COs to three faculties F1, F2 and F3 of the department. Conduction of classes will be as per the following matrix:-

	FIRST 20 PERIODS	SECOND 20 PERIODS	THIRD 20 PERIODS
F1 for CO1(L01 &L02)	B1	B2	B3
F2 for CO2 (L01 & L02)	B2	B3	B1
F3 for CO3 (L01 & L02)	B3	B1	B2

RGPV (Diploma Wing) Bhopal		Scheme for Learning Outcome			Branch Code			Course Code			CO Code	LO Code	Format No. 4
								1	0	5	3	2	
COURSE NAME		PROFESSIONAL DEVELOPMENT-I											
CO Description		Student will be able to make decision in a given professional situation											
LO Description		Student will be able to take decision in the given case situation											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process					Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks		
1	Decision making process, identification of various available alternatives, evaluation of alternatives, selection of best possible alternative	Traditional Lecture	Teacher will explain the terms mentioned in content, demonstrate the way to identify various available alternatives, to evaluate the alternatives and selection of best alternative through analyzing simple cases, conduct guided practice, formative assessment and remedial /tutorials					05	05	Any suitable training book on decision making, handout	If necessary teacher may also suggest video film or other online learning material		
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required	External / Internal				

1	Paper pen test	<ol style="list-style-type: none">1. Student will be asked to spot various alternatives available in the given simple case.2. Student will be asked to evaluate the given alternatives in the given simple case.3. Student will be asked to select the best alternative from within the given evaluated alternatives in the given simple case	10	Test Paper, Rating scale	Internal
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**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY
(IF ANY)**

The logical decision making process:

1. Specify the decision to be taken
2. Identify various available alternatives
3. Evaluate the different alternatives in light of decision to be taken
4. Select the most valued alternative as the decision

Performance indicators:-

1. Extent of correct identification of various alternatives available for decision making in the given case (4marks)
2. Extent of correctness of evaluation of alternatives in the given case (4marks)
3. Correctness of selection of best possible alternative from within the given evaluated alternatives in the given case (2 marks)

Advice: - Form three batches B1, B2 and B3 of students. Assign teaching -learning of the three COs to three faculties F1, F2 and F3 of the department. Conduction of classes will be as per the following matrix:-

	FIRST 20 PERIODS	SECOND 20 PERIODS	THIRD 20 PERIODS
F1 for C01(L01 &L02)	B1	B2	B3
F2 for C02	B2	B3	B1

	(L01 & L02)				
	F3 for C03 (L01 & L02)	B3	B1	B2	