First Year

Curriculum Structure

(*Common to All Branches*)

2020-21

Semester I

(Common to All Branches)

Sl. No	Category Of Courses	Code No.	Course Title	Hours per week			Total contact hrs/week	Credits
				L	T	P		
1	Basic Science-1	BS101	Mathematics- I	2	1	0	3	3
2	Basic Science-2	BS102	Applied Physics- I	2	1	0	3	3
3	Basic Science-3	BS103	Applied Chemistry	2	1	0	3	3
4	Humanities & Social Science-1	HS104	Communication Skills in English	2	0	0	2	2
5	Engineering Science-1	ES105	Engineering Graphics	0	0	3	3	1.5
6	Engineering Science-2	ES 106	Engineering Workshop Practice	0	0	3	3	1.5
7	Basic Science-4	ES 107	Applied Physics- I Lab	0	0	2	2	1
8	Basic Science-5	BS108	Applied Chemistry Lab	0	0	2	2	1
9	Humanities & Social Science-2	HS109	Sports & Yoga	0	0	2	2	1
10	Humanities & Social Science-3	HS110	Communication Skills in English Lab	0	0	2	2	1
	Total Credits							**18**

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Semester II

(Common to All Branches)

Sl. No	Category Of Courses	Code No.	Course Title	Hours per week			Total contact hrs/week	Credits
				L	T	P		
1	Basic Science-6	BS201	Mathematics- II	3	1	0	4	4
2	Basic Science-7	BS202	Applied Physics- II	2	1	0	3	3
3	Engineering Science-3	ES203	Introduction to IT Systems	2	0	0	2	2
4	Engineering Science-4	ES204	Fundamentals of Electrical & Electronics Engineering	2	1	0	3	3
5	Engineering Science-5	ES205	Engineering Mechanics	2	1	0	3	3
6	Basic Science-8	BS206	Applied Physics- II Lab	0	0	2	2	1
7	Engineering Science-6	ES207	Introduction to IT Systems Lab	0	0	4	4	2
8	Engineering Science-7	ES208	Fundamentals of Electrical & Electronics Engineering Lab	0	0	2	2	1
9	Engineering Science-8	ES209	Engineering Mechanics Lab	0	0	2	2	1
10	Audit-1	AU210	Environmental Science	2	0	0	2	0
	Total Credits							**20**

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Detailed First Year Curriculum Contents

(Semester I)

Mathematics I

Course Code	BS – 101
Course Title	Mathematics – I
Number of Credits	3 (L : 2, T : 1, P : 0)
Prerequisites	High School Level Mathematics
Course Category	Basic Science (BS)

Course Outcomes: By the end of the course, the students are expected to

C.O.1: Categorize the necessary background in Trigonometry to appreciate the importance of the geometric study as well as for the calculation and the mathematical analysis.(K4)
C.O.2: Identify the location of a complex number in Argand plane and carryout algebraic operations on complex numbers.(K4)
C.O.3: Determine values of large numbers having integral or non-integral powers.(K3)
C.O.4: Investigate the behavior of different types of functions.(K4)
C.O.5: Apply derivatives of different types of functions to solve problems.(K3)

Detailed Course Contents

Module – 1: Trigonometry

Number of Class hours: 10

Learning Outcomes:

1. Illustrate the concepts of Angle, distance, height with reference to different shapes, objects etc.(K3)
2. Uses of inverse trigonometric functions to calculate angles and inclinations under different situations.(K3)
3. Identify the relation between different trigonometric functions.(K4)

Detailed content of the unit:

1.1 Concept of angles, measurement of angles in degrees, grades and radians and their conversions.
1.2 Compound Angles and Associated Angles.
1.3 Transformation of sum or difference into products and products and products into sum or differences.
1.4 Multiple and Sub-multiple Angles.
1.5 Solution of Trigonometric equations (angles between 0 and 2π).
1.6 Inverse Circular Functions. Applications & simple problems.

Module – 2: Complex Number

Number of Class hours: 8

Learning Outcomes:

1. Recognize and define Cartesian and Polar form of complex number.(K4)
2. Identify the location of a complex number in Argand plane.(K4)
3. Use algebraic operations on complex numbers.(K3)

Detailed content of the unit:

2.1 Complex Numbers.
2.2 Conjugate complex number.
2.3 Geometric representation of a complex number.
2.4 Modulus and amplitude of a complex number – simple problems.
2.5 Polar form of a complex number – simple problems.
2.6 Rationalisation, addition and multiplication of complex numbers – simple problems.
2.7 Square root of a complex number – simple problems.
2.8 Cube root of unity – simple problems.
2.9 D'Moivre's Theorem – simple problems.

Module – 3: Binomial Theorem.

Number of Class hours: 8

Learning Outcomes:

1. Explain the Permutation and Combination of elements (similar and unique). (K4)
2. Identify and expand different types of binomial expressions.(k4)
3. Use Binomial Theorem to get values of large numbers having integral and rational powers.(K3)

Detailed content of the unit:

3.1 Permutations and Combinations: Factorial notation and basic principle of counting, definition and meaning of ${}^{n}P_{r}$ and ${}^{n}C_{r}$ – simple problems.
3.2 Binomial Theorem for positive integral index, general term, middle terms, co-efficient of x^n, terms independent of x^n , binomial theorem for any index (expansion without proof) first and second binomial approximation with application to engineering problems.

Module – 4: Function, Limit and Continuity.

Number of Class hours: 8

Learning Outcomes:

1. Identify different types of functions and their Domain and Range.(K4)
2. Solve limiting value of a function under different conditions.(K3)
3. Investigate the behavior of continuous and discontinuous functions.(K4)

Detailed content of the unit:

4.1 Function: Definition, types of functions, odd and even functions, periodic, composite, explicit, implicit and parametric functions. Increasing and Decreasing functions, Domain and Range of a function – simple problems.

4.2 Limit of a function: Definition, Standard limits, Left hand and Right hand limits, Evolution of limits – simple problems.

4.3 Continuity of a function: Definition, continuity of a real function at a point, testing of continuity – simple problems.

Module – 5: Differentiation

Number of Class hours: 12

Learning Outcomes:

1. Explain the meaning of differentiation.(K4)
2. Apply derivatives of different types of functions to solve problems.(K3)
3. Use 2^{nd} order derivative to solve problems.(K3)

Detailed content of the unit:

5.1 Differential Coefficient.

5.2 Differentiation of some standard functions from first principles.
(x^n, sinx, cosx, tanx, e^x and $\log_a x$).

5.3 Differentiation of sum, product and quotient of function.

5.4 Differentiation of trigonometric and inverse trigonometric functions, Logarithmic functions, Exponential functions – simple problems.

5.5 Derivative of function of a function, implicit functions, parametric function. Logarithmic differentiation – simple problems.

5.6 Successive differentiation upto 2^{nd} order – simple problems.

5.7 Physical meaning of derivative – Velocity and Acceleration – Maxima & Minima.

References:

1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.
2. H.K.Dass, Advance Engineering Mathematics, S.Chand & Company Ltd, New Delhi.
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.

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Applied Physics- I

Course Code	BS102
Course Title	Applied Physics-I
Number of Credits	3 (L: 2, T: 1, P: 0)
Prerequisites	High School Physics
Course Category	Basic Science (BS)

Course Outcome:-

After completion of the course, students will be able to:

C.O.1: Identify different systems of units and compare physical quantities with accuracy. (K4)

C.O.2: Compare among linier, angular and rotational motion. (K4)

C.O.3: Explain the methods for reduction of friction to find solution to engineering problems. (K4)

C.O.4: Apply the concept of elasticity, surface tension and viscosity to solution to engineering problems. (K3)

C.O.5: Apply the knowledge of good and bad conductors of heat needed for different engineering tasks. (K3)

Course Content:-

Module- 1: Physical world, Units and Measurements
Number of class hours: 4 to 5
Learning Outcomes:-

Students will be able to

* Identify physical quantities; select their units for use in engineering solutions. (K4)
* Apply the method of dimensions to derive physical equation. (K3)
* Discuss the advantages and limitations of dimensional equations. (K2)
* Compare & measure different physical quantities with accuracy by minimizing different types of errors. (K4)

Content:-

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.

Module- 2: Force and Motion
Number of class hours: 6 to 7
Learning Outcomes:-

Students will be able to

- Describe force, linear momentum, angular displacement, angular acceleration, angular momentum, torque, frequency, and time period. (K1)
- Compare and relate physical properties associated with linear motion and rotational motion. (K4)
- Apply conservation of angular momentum principle to known problems. (K3)

Content:-

Force, Resolution of forces, 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.

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

Module- 3: Work, Power and Energy
Number of class hours: 7 to 8
Learning Outcomes:-

Students will be able to

- Define work, power, energy and their units. (K1)
- Use the relationships amongst work, power and energy to apply in engineering solutions. (K3)
- Identify various forms of energy, energy transformation and state the principle of conservation of energy. (K4)
- Explain the forms of friction and methods to minimize friction between different surfaces. (K2)

Content:-

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).

Module- 4: Properties of Matter
Number of class hours: 10-12
Learning Outcomes:-

Students will be able to

- Define stress, strain, moduli of elasticity, atmospheric pressure, absolute pressure, gauge pressure. (K1)
- Explain the phenomenon of surface tension, viscosity of fluid, co-efficient of viscosity, factors affecting surface tension and viscosity. (K2)
- State Hooke's law, Stoke's law. (K1)
- Solve engineering problems applying the concept of elasticity, surface tension and viscosity. (K3)

Content:-

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 numerical) and its applications.

Module- 5: Heat and Thermometry
Number of class hours: 7-8
Learning Outcomes:-

Students will be able to

- Discuss the concepts of heat and temperature, measure temperature in various processes on different scales (Celsius, Fahrenheit and Kelvin etc). (K2)
- Illustrate the processes of conduction, convection and radiation. (K3)

Content:-

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.

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 Bhhatacharya & 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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Applied Chemistry

Course Code	BS 103
Course Title	Applied Chemistry
Number of Credit	3 (L: 2, T: 1, P: 0)
Prerequisites	High School Level Chemistry
Course Category	BS

Course Outcome:

After completion of the course, students will be able to

C.O.1: Discuss the fundamentals of Atomic Structure and Chemical Bonding. $\mathbf{K_2}$

C.O.2: Illustrate the fundamentals of Oxidation, Reduction and Solution and relate the laws of Electrolysis in the Industrial field. $\mathbf{K_3}$

C.O.3: Illustrate various water sample and discuss set up for removal of Hardness of water. $\mathbf{K_3}$

C.O.: Discuss the fundamentals of fuel and lubricant and identify the selection of lubricant for different types of machine. $\mathbf{K_2}$

C.O.5: Use the properties of various Engineering Materials – Metals (Iron, Aluminium and Copper), Portland cement, glass, brick, polymer in real life situation. $\mathbf{K_3}$

Course Content:

Module – 1 : Atomic Structure and Chemical Bonding
Number of Class hours : 8 hours

Learning Outcome : Students will be able to

- ✓ Explain the structure of atom using Rutherford and Bohr's atomic model. $\mathbf{K_2}$
- ✓ Define and classify quantum number based upon atomic structure, $\mathbf{K_1}$
- ✓ Understand significance of quantum numbers. $\mathbf{K_2}$
- ✓ Discuss the shapes of various orbitals (s-p-d). $\mathbf{K_2}$
- ✓ Describe various rules and principles (Hund's Rule, Pauli's Exclusion Principle Heisenberg Uncertainity Principle).$\mathbf{K_1}$
- ✓ Describe Electronic configuration (z=1-30). $\mathbf{K_1}$
- ✓ Describe various types of bonding, their characteristics and formation of each type using suitable examples (NaCl, H_2, F_2, HF and $NH_4^{+)}$. $\mathbf{K_1}$

- ✓ Understand the concept of hybridization(sp, sp^2, sp^3) **K_2**
- ✓ Discuss shape and find bond angles of various molecules using VSEPR theory($BeCl_2$, BF_3, CH_4, NH_3, H_2O. **K_2**
- ✓ Describe types of Hydrogen Bonding in NH_3 and H_2O. **K_2**

Detailed content of the Unit :

RUTHERFORDS ATOMIC MODEL- Postulates and Defects. BOHRS ATOMIC MODEL – Postulates and Defect, Heisenberg Uncertainity Principle, Quantum Numbers-Orbital Concept, Shapes of s ,p and d orbitals. Aufbau Principle, Hunds Rule, Paulis Exclusion Principle, Electronic Configuration. Concept of Chemical Bonding, Characteristics of Electrovalency, Covalency. Types of bonds: Ionic bonding (NaCl example),Covalent bonding (H_2, F_2, HF), Co-ordinate bonding(NH_4^+ Concept of Hybridisation SP^3,SP^2 and SP and shape of molecules by VSEPR Theory ($BeCl_2$, BF_3 ,CH_4, NH_3), Hydrogen Bonding(NH_3 and H_2O)

Module – 2 : Solution, Oxidation and Reduction and Electro Chemistry

Number of Class hours: 8 hours

Learning Outcomes: Students will be able to

- ✓ Explain terms related to solutions. **K_2**
- ✓ Discuss standard solutions. **K_2**
- ✓ Illustrate the units of various concentration terms.**K_3**
- ✓ Explain the fundamentals of oxidation and reduction. **K_2**
- ✓ Discuss half cell reaction (oxidation half cell and reduction half cell) and balance chemical equation by Ion Electron Method. **K_2**
- ✓ Discuss Faraday's Laws of Electrolysis. **K_2**
- ✓ Apply Faraday's Laws of Electrolysis in solving numerical problems. **K_3**
- ✓ Use Laws of electrolysis in industry. For example electroplating, electrotyping, etc. **K_3**
- ✓ Discuss various Electrolytic cell. **K_2**
- ✓ Discuss and classify Corrosion (chemical and electro chemical). **K_2**

Detailed content of the Unit:

Concept of Solute, Solvent and Solution. Standard Solution, Normal Solution, Molar Solution. Concentration terms: Normality, Molarity, Mole Fraction. Electronic concept of Oxidation, Reduction and Redox reaction. Half cell reaction (oxidation and reduction), Faraday's Laws of Electrolysis (First and Second Law), Problems. Industrial application – Electroplating, Electrotyping, Galvanization. Electrolytic Cell, Electro Chemical Cell, Primary Cell - Dry Cell, Secondary Cell – Lead Storage Cell, Introduction to Corrosion of Metals – definition, types of Corrosion (Chemical and Electro Chemical)

Module – 3 : Water

Number of Class hours : 6 hours

Learning Outcomes : Students will be able to

- ✓ Discuss hard and soft water. $\mathbf{K_2}$
- ✓ Tell unit of hardness (mg / litre & ppm). $\mathbf{K_1}$
- ✓ Discuss the cause of Hardness. $\mathbf{K_2}$
- ✓ Solve numerical problems based on Hardness. $\mathbf{K_3}$
- ✓ Discuss disadvantages of Hard water and hence their removal. (special reference to Zeolite process and de-ionisation. $\mathbf{K_2}$
- ✓ Explain the concept of scale and sludge. $\mathbf{K_2}$
- ✓ Find (estimate) hardness of water by EDTA method. $\mathbf{K_1}$

Detailed content of the Unit:

Soft Water and Hard Water, causes of Hardness, Numerical Problems, Removal of Hardness – Permutit process(Zeolite process), Problems caused by the use of Hard water in Boiler (Scale and Sludge formation), De-ionisation of Water, Quantitative Measurement of Water Hardness by EDTA Method.

Module – 4 : Fuel and Lubricant

Number of Class hours : 6 hours

Learning Outcomes : Students will be able to

- ✓ Discuss and classify fuel and Differentiate between Gross and Net Chalorific value (HCV and LCV). $\mathbf{K_2}$
- ✓ Explain rating of fuel (octane Number and Cetane Number). $\mathbf{K_2}$

- ✓ Discuss coal (proximate and ultimate annalysis). **K_2**
- ✓ Describe various fractions of Petroleum, their fractionating temperature and use. **K_1**
- ✓ Discuss various gaseous fuel (LPG, CNG, Water Gas, Coal Gas, Producer Gas and Bio Gas.. **K_2**
- ✓ Discuss lubricant and lubrication and to classify lubricant with example. **K_2**
- ✓ Describe characteristic property of good lubricant. **K_2**
- ✓ Discuss some physical properties of lubricant (Oiliness, Flash and Fire point, Cloud and Pour point. **K_2**

Detailed content of the Unit:

Defination of Fuel, Classification of Fuel, Chalorific values (HCV and LCV), Calculation of HCV and LCV using Dulong Formula, Proximate and Ultimate Analysis of Coal, Defination of Fuel, Classification of Fuel, Chalorific values (HCV and LCV), Calculation of HCV and LCV using Dulong Formula, Proximate analysis of Coal, Fractional Distillation of Petroleum, Fuel rating (Octane and Cetane Number), Chemical composition, Chalorific values and applications of LPG, CNG, Water Gas, Coal Gas, Producer Gas and Bio Gas. Definition, Classification with example, Function and Characteristic properties of good lubricant, Physical properties – Oiliness, Flash and Fire point, Cloud and Pour point.

Module –5 : Engineering Materials

Number of Class hours : 8 hours

Learning Outcomes : Students will be able to

- ✓ Discuss various Metallurgical terms (mineral, ore, Gangue, Flux, Slag). **K_2**
- ✓ Explain various extraction processes of Metals with special reference to Iron from Haematite Ore using Blast Furnace, Aluminium from Bauxite. **K_2**
- ✓ Discuss percentage composition, properties and uses of Ferrous and Non-ferrous alloys (Brass, Bronze, German Silver and Duralumin). **K_2**
- ✓ Discuss the raw material require for the manufacture of Portland cement and the percentage composition of various component of Portland Cement. **K_2**
- ✓ Explain the Principle behind setting and hardening of Portland Cement. **K_2**
- ✓ Discuss types of glass (at least three) example Borosil. **K_2**
- ✓ Describe refractory with suitable example brick. **K_2**
- ✓ Discuss and classify polymer. **K_2**
- ✓ Explain monomers of few commercially important Polymers. **K_2**
- ✓ Discuss the structure of Polymers and their monomer and differentiate between Thermosetting and thermo Plastic resin. **K_2**
- ✓ Illustrate the application of few Commercially important Polymer. **K_3**
- ✓ Explain Vulcanization of rubber and know their properties. **K_2**

Detailed content of the Unit:

Natural Occurrence of metals – Minerals, Ores of Iron, Aluminium and Copper, Gangue, Flux, Slag, Extraction of – Iron from Haematite Ore using Blast Furnace, Aluminium from Bauxite, Alloys – definition, Identify percentage composition, properties and uses of Ferrous and Non-ferrous alloys (Brass, Bronze, German Silver and Duralumin), Portland Cement – composition, raw materials, Setting and Hardening of Cement. Glass – definition, types and raw materials, Refractory – definition and example, Polymers – definition, classification of Polymers, simple reaction involved in preparation and their application of thermoplastic and thermo setting plastics (using PVC, Bakelite, Teflon, neoprene, buna-s, Nylon – 6 and Nylon – 6-6) Vulcanization of rubber.

References / Suggested learning resources:

BOOKS:

Text book of Chemistry for Class XI and Clas XII (Part I and Part II) NCERT, Delhi 2017-18

- Agarwal & Shikha, Engineering Chemistry Cambridge University Press, New Delhi – 2015
- Dara S S and Dr S. S. Umare Engineering Chemistry, S Chand Publication, New Delhi - 2015
- Dr Aloka Debi, Chemistry I and II, Bhagabati Prakasani
- Jain & Jain, Engineering Chemistry, Dhanpat Rai Publishing Co.
- B. K. Sharma, Engineering Chemistry, Goel Publishing House
- Applied Chemistry I and II, Dr. Raman Rani Mittal, S K Kataria & Sons

Open source software and website address:

- **www.chemguide.co.uk/atommenu.html** (atomic structure and chemical bonding)
- **www.visionlearning.com** (atomic structure and chemical bonding)
- **http://www.wastewaterlearning.com/elearning/** (water treatment)
- **www.capital-refractories.com** (metals, alloys, cement and refractory material)
- **www.em-ea.org/guide%20books/book-2/2.1%20fuels%20and%20combustion.pdf** (fuel and conversion)

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Communication Skills in English

Course Code	**:**	**HS104**
Course Title	**:**	**Communication Skills in English**
Number of Credits	**:**	**2 (L: 2, T: 0, P: 0)**
Prerequisites	**:**	**NIL**
Course Category	**:**	**HS**

Course outcomes:

At the end of this course, the participants will be able to

CO1 Develop conceptual knowledge of communication skill - K2

CO2 Demonstrate technical communication skills both in verbal and written format – K3

CO3 Apply the knowledge of soft skills for professional excellence – K3

CO4 Construct grammatically correct independent sentences and long texts – K3

CO5. Develop various life skills related to professional communication –K3

Unit-1 Communication: Theory and Practice (12 Marks)

Number of Class hours: 8

Learning Outcome:

i) Explain the basic concepts of communication skills –K1
ii) Analyse the factors of effective communication – K2
iii) Design the modes of technical communication – K3

Detailed Content

• **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** (Body Language)

(Choosing words, Voice Modulation, Clarity, posture and gestures) C/H-2

• **Technical Communication.** (Types and examples) C/H-6

Business Letters (written), telephonic conversations (oral)

Report Writing – Types, Structures, Data Collection, Content, Form

Writing a Proposal, Recommendation, Instruction

Unit-2 Soft Skills for Professional Excellence (12 Marks)

Number of Class hours: 8

Learning Outcome:

i) Learn the importance of soft skills in one's personal and professional life –K2
ii) Outline various life skills related to professional communication – K3
iii) Apply soft skills for professional excellence-K3

Detailed Content

• **Introduction:** Soft Skills and Hard Skills - Importance of soft skills C/H-2

• **Life skills:** Self-awareness and Self-analysis, adaptability, resilience, emotional intelligence, empathy etc C/H-2

• **Applying soft skills across cultures**

(Examples of beliefs and customs of community and ethnicity) C/H-2

• **Case Studies**

(Examples of implementation of soft skill for professional success) C/H-2

Unit-3: Reading Comprehension (12 Marks)

Number of Class hours: 8

Learning Outcome:

i) Comprehend a given text K2

ii)Analyse the content words- K2

iii) Restate the vocabulary to express in verbal and written communication.- K3

Detailed Content

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

Section-1 (Prose) C/H-4

Malgudi Days: R.K. Narayan

"Uncle Podger Hangs a Picture" Jerome K. Jerome

Section-2 (Poems) C/H-4

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 (12 Marks)

Number of Class hours: 10

Learning Outcome:

i) Write Business and personal letters –K3

ii)Develop précis out of a given text –K3

iii) Draft a written text meant for professional communication.-K3

Detailed Content

1. The art of précis writing C/H-2

2. Letters: personal and business C/H-2

3. Drafting e-mails, notices, minutes of a meeting, Memos C/H-2

4. Writing Proposals, Reports, Instruction. C/H-4

Unit-5: Vocabulary and Grammar (12 Marks)

Number of Class hours: 08

Learning Outcome:

i) Expand the vocabulary of commonly used words, Idioms and Phrases. – K1

ii)Explain grammatical functions of words and punctuation marks – K2

iii) Apply appropriate vocabulary and grammar in spoken and written language –K3

Detailed Content

1. **Vocabulary**:

Synonym and antonym of commonly used words (at least 20)

One-word substitution (at least 20)

Idioms and phrases (at least 20) C/H-2

2. **Remedial Grammar** C/H 4

Parts of speech, Determiners, Modals, degree of comparison, Subject-Verb Agreement

Voice (Active and Passive)

Sentence type and structure

(Types: declarative, interrogative, imperative, exclamatory, optative;

Structure: simple, compound, complex)

Tenses (structure and example)

(Transformation of sentences without changing the meaning based on the grammatical functions)

3. **Punctuation** (functions and proper use of punctuation marks in written text) C/H-2

List of Recommended Study Materials:

Books

1. Wren and Martin, English Grammar and Composition,S Chand & Company Limited, New Delhi.
2. Kulbhushan Kumar, Effective Communication Skills, Khanna Publishing House, New Delhi (Revised Edition 2018)
3. M. Ashraf Rizvi. Effective Technical Communication. Mc-Graw Hill: Delhi, 2002.
4. Oxford Advanced Learner's Dictionary, OUP
5. Roget's Thesaurus of English Words and Phrases
6. English for Polytechnics by Dr Papori Rani Barooah (Eastern Book House Publishers)
7. Technical Communication, Meenakshi Raman & Sangeeta Sharma, Oxford University Press
8. Communication Skills, Pushplata, Sanjay Kumar, Oxford University Press

Web

1. Swayam MOOC. (English, communication skill and soft skill courses) www.swayam.gov.in
2. Malgudi Days (https://archive.org/details/NarayanRKMalgudiDays)
3. "Uncle Podger Hangs a Picture" Jerome K. Jerome

(https://docplayer.net/20977136-Uncle-podger-hangs-a-picture.html)

4. https://allpoetry.com
5. https://www.skillsconverged.com
6. https://learnenglishteens.britishcouncil.org

Engineering Graphics

Course Code	:	ES105
Course Title	:	Engineering Graphics
Number of Credits	:	1.5 (L: 0, T: 0, P:3)
Prerequisites	:	NIL
Course Category	:	ES

Course Outcomes

Following outcomes will be achieved:

1) Select and construct appropriate drawing scales, use drawing equipment's, and understand Indi- an Standards of engineering drawing (K3)
2) Draw views of given object and components (K2)
3) Sketch orthographic projections into isometric projections and vice-versa (K3).
4) Apply computer aided drafting tools to create 2D engineering drawings(K3)

Course Content

Unit – I Basic elements of Drawing

No. of Lectures required: 5

Unit Learning Outcomes:

1. Know and understand the conventions and method of engineering drawing(K1)
2. Interpret engineering drawings using fundamental technical mathematics(K2)
3. Construct basic and intermediate geometry(K3)

Contents:

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 diagonalscale.

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

No. of Lectures required: 8

Unit Learning Outcomes:

1. Identify the principle views and types of lines used in orthographic projection(K2)

2. Identify auxiliary and sectional views(K2)

Contents:

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

No. of Lectures required: 8

Unit Learning Outcomes:

1. Set up and use a drawing board to effectively draw 3D shapes(K2)

2. Draw isometric view and isometric projection of planes and solids(K3)

Contents:

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

No. of Lectures required: 5

Unit Learning Outcomes:

1. Enables visualization of an idea in the form of a sketch(K2)

2. Synthesize the use of two-dimensional and three-dimensional drawing(K3)

Contents:

Freehandsketchesofmachineelements:Threadprofiles,nuts,bolts,studs,setscrews,washer, Locking arrangements. (For branches other than mechanical Engineering, the teacher should select branch specific elements for free handsketching)

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

Unit – V Computer aided drafting

No. of Lectures required: 12-16

Unit Learning Outcomes:

1. Use interface, command panel, menus and command icons(K2)

2. Setting up file features, units, limits, grid, snap, undoing and redoing action(K2)

3. Create basic drawing with drawing commands in AutoCAD (K2)

4. Modify and reform the objects that created in virtual environment(K3)

5. Use AutoCAD's plotter setting and print out the drawing in AutoCAD in proper format(K3)

Contents:

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, sta- tusbar, 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. Draw basic entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline, Poly Line. 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 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, differ- ent 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	Drawregulargeometricconstructionsandredrawthegivenfigure(dothisexer- cise in sketch book) PartI	II	02
4	Draw regular geometric construction and redraw the given figure (do this exer- cise in sketch book) Part II	II	02
5	Draw a problem on orthographic projections using first angle method of projec- tion 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	Drawtwoproblemsonorthographicprojectionsusingfirstanglemethodofpro- jection having cylindrical surfaces, ribs. PartI	III	02
8	Draw two problems on Isometric view of simple objects having plain and slant- ing surface by using natural scale. Part I	IV	02
9	Draw some problems on Isometric projection of simple objects having cylindri- cal 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	ProblembasedLearning:Giventheorthographicviewsofatleastthreeobjects with few missing lines, the student will try to imagine the corresponding ob- jects, complete the views and draw these views in sketch book. PartI	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). PartIV	V	02
16	Drawbasicbranchspecificcomponentsin2DusingAutoCAD(Printoutshould be a part of term work). Part I	V	02
17	Draw complex branch specific components in 2D using AutoCAD (Print should be a part of progressive assessment). Part I	V	02
	Total		34

SUGGESTED LEARNING RESOURCES

1. BureauofIndianStandards.EngineeringDrawingPracticeforSchoolsandCollegesIS:Sp-46.BIS. Government of India, Third Reprint, October 1998; ISBN:81-7061-091-2.
2. Bhatt,N.D.EngineeringDrawing.CharotarPublishingHouse,Anand,Gujrat2010;ISBN:978-93-80358-17-8.
3. Jain&Gautam,EngineeringGraphics&Design,KhannaPublishingHouse,NewDelhi(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 Pri- vate Limited-New Delhi (2010); ISBN:978-8120337831.
8. Jeyapoovan, T. Essentials of Engineering Drawing and Graphics using AutoCAD. Vikas Publishing HousePvt. Ltd, Noida, 2011; ISBN:978-8125953005.
9. Autodesk. AutoCAD User Guide. Autodesk Press, USA,2015.
10. Sham,Tickoo.AutoCAD2016forEngineersandDesigners.DreamtechPress;GalgotiaPublication , New Delhi, 2015; ISBN978-9351199113.

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

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Engineering Workshop Practice

Course Code:	**ES106**
Course Title:	**Engineering Workshop Practice**
Number of Credits:	1.5 (L: 0, T: 0, P: 3)
Prerequisites:	NIL
Course Category:	ES

(For All Branches Excluding Medical Laboratory Technology & Fashion Technology)

Course Objectives:

C.O.1: To understand basic engineering processes for manufacturing and assembly (K2).

C.O.2. To understand, identify, select and use various marking, measuring, and holding, striking and cutting tools and equipment's (K3)

C.O.3: To understand and interpret job drawings, produce jobs, and inspect the job for specified dimensions (K2)

C.O.4: To understand the various types of wiring systems and acquire skills in house wiring (K3)

C.O.5: To understand, operate, control different machines and equipment's adopting safety practices (K2)

Learning Outcome:

I. Students will be able to know different wood working tools / machines and its applications/ operations.
II. Students will be able to know different fitting tools / machines and its applications/ operations.
III. Students will be able to know different welding tools/ machines and its applications/ operations.
IV. Students will be able to know different Sheet Metal tools / machines and its applications/ operations.
V. Students will be able to do simple of house wiring
VI. Students will be able to measure voltage, current, power, etc.

Course Content:

Sl. No.	Name of The Shops	Details Of Practical Content
I	Carpentry Shop:	i) Demonstration of different wood working tools / machines. ii) Demonstration of different wood working processes, like plaining, marking, chiselling, grooving, turning of wood etc. iii) One simple job involving any one joint like mortise and tenon, dovetail, bridle, half lap etc.
II	Fitting Shop	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 Shop	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 Shop	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 Workshop	Electrical House Wiring Shop: 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-install bedroom lighting. And (v) Simple lamp circuits-install stair case wiring.
VI	Electrical Workshop	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

References:

1. S.K. Hajara Chaudhary, Workshop Technology, Media Promoters and Publishers, New Delhi, 2015
2. B.S. Raghuwanshi, 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

Engineering Workshop Practice

(For Medical Laboratory Technology Only)

Course Outcomes:

Students will be able to

CO1: Remember formula to prepare different laboratory solutions. CO2: Students will be able to understand principles of preliminary biochemical test of carbohydrate and protein. (K1)
CO3: Understand measures of laboratory safety. (K2)
CO4: Prepare different laboratory solutions and perform preliminary biochemical test of carbohydrate and protein. (K3)
CO5: Analyse results of preliminary biochemical test of carbohydrate and protein. (K4)

Detailed Content:

A. Medical laboratory shop

1. Preparation of solutions a. Normal solution, molar solution, molal solution b. W/V, V/V, % solution etc.
2. Introduction to qualitative biochemical tests for identification of carbohydrates.
3. Vitamins and Minerals a. Fat soluble vitamins : Vit – A, D, E, K b. Water soluble Vitamins: Vit – C, B- complex
4. Biochemical tests for Proteins (Colour Reactions) a. Biuret Test b. Ninhydrin Test
5. Experiments on blood a. Preparation of blood smear and staining b. Observation of blood smear under microscope c. Separation of plasma and serum from blood d. Detection of BT and CT of blood

B. Laboratory safety

B.1 Electrical safety of MLT Lab

1. General safety & precautions of Medical Laboratories
2. Electric shock, precaution & treatment measure.
3. Fuse and safety measure using MCB etc for Medical Laboratory equipments.
4. General rules of Earthing as safety measure.
5. Common Medical Devices.
6. Standard electrical wiring materials.
7. Testing of different equipments & laboratory instruments.

B.2 Chemical safety of MLT Lab

1. Handling of Acids & Bases.
2. Safety upon spilling of chemicals.
3. Storage & refrigeration of chemicals.
4. Storage of Reagents & Kits.
5. Laboratory first-aid

Engineering Workshop Practice

(For Fashion Technology Only)

After completing this programme Students will be able to-

1) Remember or acknowledged all tools and equipments used for drawing. (K1)
2) Understand & perform drawing of basic outlines used in different fashion diagram (K2)
3) Understand the concept of basic anatomy figure of Man and Woman (K2)
4) Understand the skills required for drawing different basic design on square paper (K2).
5) Learn to identify different parts of the Sewing machine and their functions. Identify descriptively the tools used in the different fashion designing processes (K2).
6) Understand the basics of quality of different fabric sample. Learn to identify the texture & aesthetic appearance of different products (K2).
7) Understand and adopting good interpersonal skills to develop basic block , Print design on fabric (K3).

Content:

1.Knowledge of drawing equipments and tools : paper, markers and pencils of different grades (HB,B,2B,4B,6B),drawing board, ruler, different media (charcoal, ink, water color, color pencils etc).

2. Illustrate different types of lines: vertical, horizontal, diagonal, zigzag, curved, thick and thin.

3. Sketching a basic 8-head figure anatomy of a woman and man.

4. Basic design skills of square area on paper: Stripes, checks, geometrical, floral, abstract etc.

5. Knowledge of different measuring and cutting equipments and tools: Tape, Dress forms, L-scale, hip curve, French curve, Scissors (paper/fabric)

6. Color exercises on: color wheel- primary, secondary, warm, cool, and tertiary value and shades etc.

7. Knowledge on parts of basic sewing machines and its operations.

8. Preparation of a catalogue of different fabric samples.

9. Prepare a basic block designs on paper for cutouts.

10. Use of basic block design cutouts and fabric colors on the surface of any cotton fabrics.

Applied Physics- I Lab

Course Code	BS107
Course Title	Applied Physics-I Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Nil
Course Category	Basic Science

Course Outcome:-

Students will be able to:-

C.O.1: Use Vernier calliper & Screw gauge to measure different dimensions of solid bodies. (K3)

C.O.2: Analyse the laws of forces and verify the conservation laws. (K4)

C.O.3: Categorise the different properties of matter by measuring their values. (K4)

C.O.4: Use temperature measuring instruments. (K3)

List of Practical's/ Activities (To perform minimum 6 practical).

1. To measure length, radius of a given cylinder, a test tube and a beaker using a Vernier caliper.

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 verify law of conservation of mechanical energy (PE to KE).

7. To determine force constant of a spring using Hook's Law.

8. To find the viscosity of a given liquid (Glycerin) by Stoke's law.

9. To determine atmospheric pressure at a place using Fortin's barometer.

10. To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.

Applied Chemistry Lab

Course Code	BS108
Course Title	Applied Chemistry Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Nil
Course Category	Basic Science

Applied Chemistry Lab I

CO1: Prepare different standard solution (K3)

CO2: Analyze strength of different solution (K4)

CO3: Identify different ores (K4)

CO4: Explain the first law of electrolysis (K2)

CO5: Illustrate properties of electro chemical cell (K3)

CO6: Test the property of solution (K3)

Perform any six experiments

1. Preparation standard solution of
   a) Oxalic acid
   b) Potassium permanganate
2. Standardization of potassium permanganate solution using standard oxalic acid.
3. Determination of strength of given a) sodium hydroxide and b) sodium carbonate solution by titrating against standard oxalic acid solution using phenolphthalein indicator.
4. Iodometric estimation of copper in the copper pyrite ore.
5. Redox titration: Potassium permanganate Vs Oxalic acid.
6. To verify the first law of electrolysis of copper sulphate using copper electrode.
7. Construction and measurement of emf of electro chemical cell (Daniel Cell).
8. Determination of pH of given solution by pH meter.
9. Determination of percentage of iron present in given hematite ore by potassium permanganate.
10. To study the effect of dissimilar metal combination.

Sports & Yoga

Course Code	HS109
Course Title	Sports & Yoga
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Nil
Course Category	Humanities & Social Science

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, Dhayanchand 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, Sharasana.
  - 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.
- Asthema: 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 elated to exercise and training.

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Communication in English Lab

Course Code	**:**	**HS110**
Course Title	**:**	**Communication Skills in English - Lab**
Number of Credits	**:**	**1 (L: 0, T: 0, P: 2)**
Prerequisites	**:**	**NIL**
Course Category	**:**	**HS**

Course Outcome:

At the end of this course, the students will be able to

CO1 Develop active listening skills and become efficient communicator –K2

CO2 Apply the knowledge of phonetics for better pronunciation – K3

CO3 Utilize non-verbal communication skills in oral presentations.- K3

CO4 Demonstrate oneself as an efficient user of applied grammar and appropriate vocabulary.- K3

CO5 Develop sense of self responsibility to communicate effectively at professional level in general and at personal level in particular.-K4

Unit I Listening Skills (08 Marks)

Number of Class hours: 6

Learning Outcome:

i) Explain the process of active listening –K3

ii)Analyse the content to be communicated –K2

Detailed Content

Listening Process and Practice:

(Activity with recorded lectures, poems, interviews and speeches) C/H 6

Practical Lab Activity:

Listen to a material and respond accordingly.

Unit II Introduction to Phonetics (08 Marks)

Number of Class hours: 8

Learning Outcome:

i) Describe human speech sounds with corresponding phonetic symbols – K1

ii)Transcribe from English to phonetic scripts and vice versa – K3

iii) Explain the content in own words.- K3

Detailed Content

1. Speech Sounds: Practice of vowels, consonants with corresponding IPA Symbols C/H 2

2. Transcription: from English to phonetic script and vice versa C/H 2

3. Syllable division and word stress patterns: intensive practice for learning Received Pronunciation (RP) and General Indian English (GIE). C/H 2

4. Intonation: Practice of for learning Received Pronunciation C/H 2

Practical Lab Activity:

1. Write and pronounce IPA symbols of Vowels and Consonants.
2. Working with Syllable, Stress, Accent and Intonations.
3. Transcribe a small text/ pronounce a small transcribed text

Unit III Speaking Skills (08 Marks)

Number of Class hours: 10

Learning Outcome:

i) Categorise various modes of oral presentations – K2

ii)Design and present audio visual aided presentations- K3

iii) Demonstrate interpersonal skills through conversations.- K3

Detailed Content

1. Oral Presentations:

Impromptu and extempore speech, public speaking, Group discussion C/H 6

2. Business presentations: (Audio Visual aided) C/H 2

3. Conversation practice: Role playing and Debate on pre selected topics C/H 2

Practical Lab Activity:

1. GD on pre-selected topic
2. Oral presentation/Public speaking on pre-selected topic
3. Debate on pre-selected topic

4. Role Play and Lively Conversations in given formal/informal situation.
5. Business Presentation using audiovisual aids on pre-selected topics

Unit IV Building vocabulary (08 Marks)

Number of Class hours: 8

Learning Outcome:

i) Construct the exact vocabulary and phrases in communication –K3

ii)Utilize a set of vocabulary in oral and written expressions.- K3

iii) Demonstrate significant improvement in stock of vocabulary.-K3

Detailed Content

Word formation: (at least 10 each) C/H 2

Phrasal verbs: Study of Selected phrasal verbs (at least 20) C/H 2

Learning foreign phrases: Study of Selected words (at least 20) C/H 2

Jargon/ Register: study of words related to organizational set up (at least 20 each) C/H 2

Practical Lab Activity:

1. Word exercises and word games to enhance self-expression and vocabulary of participants.

Unit V Applied Grammar & Composition (08 Marks)

Number of Class hours: 8

Learning Outcome:

i) Identify the grammatical function of words –K2

ii)Construct grammatically accurate sentences.- K3

iii) Demonstrate skill of writing long text using correct grammatical structures.-K3

Detailed Content

1. Sentence correction and Error analysis based on grammatical functions:

(Prepositions, conjunctions, modals, determiners, tense etc.) C/H 2

2. Joining and splitting of various types of sentences. C/H 2

3. Reporting: (interchange of direct and indirect speech) C/H 1

4. Writing correctly in real life situations

(Letters, petitions, articles, competitive essays etc .) C/H 2

5.Voice Change (Active to passive voice and vice versa) C/H 1

Practical Lab Activity:

1. Editing sentences or paragraphs with grammar corrections
2. Join or Split sentences
3. Compose grammatically correct texts

List of Recommended Study Materials:

Books

1. Wren and Martin, English Grammar and Composition,S Chand & Company Limited, New Delhi.
2. Kulbhushan Kumar, Effective Communication Skills, Khanna Publishing House, New Delhi (Revised Edition 2018)
3. M. Ashraf Rizvi. Effective Technical Communication. Mc-Graw Hill: Delhi, 2002.
4. English for Polytechnics by Dr Papori Rani Barooah (Eastern Book House Publishers)
5. Technical Communication, Meenakshi Raman & Sangeeta Sharma, Oxford University Press
6. Communication Skills, Pushplata, Sanjay Kumar, Oxford University Press

7. Kulbhushan Kumar, Effective Communication Skills, Khanna Publishing House, New Delhi (Revised Ed. 2018)
8. J.D.O'Connor. Better English Pronunciation. Cambridge: Cambridge University Press, 1980.
9. Margaret M. Maison. Examine your English. Orient Longman: New Delhi, 1964.
10. T. Balasubramanian. A Textbook of English Phonetics for Indian Students. New Delhi: Macmillan India Ltd, 2000.

Web

1. Swayam MOOC (English and communication skill courses) www.swayam.gov.in

2. https://www.internationalphoneticassociation.org

3. https://positivepsychology.com/communication-games-and-activities/

4. https://www.grammarbank.com/english-vocabulary-exercises.html

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