

**Detailed Course Scheme**  
**Bachelor of Science (B. Sc.)**  
**(Biotech)**

**Semester -II**  
**(2020-2021)**

DOC202002250021



**RNB GLOBAL UNIVERSITY**

RNB Global City, Ganganagar Road,  
Bikaner, Rajasthan 334601

## **OVERVIEW**

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June)**. Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for B. Sc. (Biotech) Program along with examination pattern is as follows

### **Course Scheme**

#### **Semester - II**

S. No.	Course Code	Course Name	L	T	P	Credits
1.	13000700	Chemistry II	4	0	0	4
2.	13001100	Chemistry-II Lab	0	0	4	2
3.	13007300	Plant Anatomy and Embryology	4	0	0	4
4.	13007400	Plant Anatomy and Embryology Lab	0	0	4	2
5.	13005900	Biochemistry & Metabolism	4	0	0	4
6.	13006000	Biochemistry & Metabolism Lab	0	0	4	2
7.	99001900	Environmental Studies	4	0	0	4
8.	13002800	Ability & Skill Enhancement - II	2	0	0	2
9.	99002800	Workshops & Seminars	-	-	-	1
10.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>18</b>	<b>0</b>	<b>12</b>	<b>26</b>

### **EVALUATION SCHEME -THEORY**

The evaluation of the theory paper of B.Sc. program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

### **Internal Assessment**

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **External Assessment**

Type	Marks
Theory	50

### **EVALUATION SCHEME -PRACTICAL**

The evaluation of the practical paper of B.Sc. program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

### **Internal Assessment**

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Attendance	75%+ : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

## External Assessment

Type	Marks
Practical	50

## EVALUATION SCHEME- WORKSHOPS & SEMINARS AND HUMAN VALUES & SOCIAL SERVICE/NCC/NSS

1. The evaluation of Workshops & Seminar and Human Values & Social Service/NCC/NSS will be completed from Semester I – Semester VI. It will be evaluated internally by the various Forums & Schools Concerned. The credit for this will be given at the end of each Semester.
2. The students have to join club/clubs/Forums with the active participation in different activities of club. The students would be continuously assessed from Semester-I to Semester-IV and credits and marks would be given after the end of each Semester

## CURRICULUM

**Course Name: Chemistry II**

**Course Code: 13000700**

### Objectives

Whole Syllabus is divided into 48 core Lectures, 04 clarification classes, 01 presentation, seminar, webinar, guest lectures and 2 quizzes to test the core concept of the student.

### Course Outline:

#### **Unit I: Chemical Energetics**

Review of thermodynamics and the Laws of Thermodynamics. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature – Kirchhoff's equation. Statement of Third Law of thermodynamics and calculation of absolute entropies of substances.

## **Unit II: Chemical Equilibrium**

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between  $\Delta G$  and  $\Delta G^\circ$ , Le Chatelier's principle. Relationships between  $K_p$ ,  $K_c$  and  $K_x$  for reactions involving ideal gases.

## **Unit III: Ionic Equilibria**

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

**Unit IV:** Section B: Organic Chemistry-2 Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

Aromatic hydrocarbons.

Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (upto 4 carbons on benzene).

Alkyl and Aryl Halides

Alkyl Halides (Upto 5 Carbons) Types of Nucleophilic Substitution ( $S_N1$ ,  $S_N2$  and  $S_Ni$ ) reactions.

Preparation: from alkenes and alcohols.

Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamson's ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions.

Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by  $-OH$  group) and effect of nitro substituent. Benzyne Mechanism:  $KNH_2/NH_3$  (or  $NaNH_2/NH_3$ ). Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides.

Alcohols, Phenols and Ethers (Upto 5 Carbons) Alcohols:

Preparation: Preparation of 1 $^\circ$ , 2 $^\circ$  and 3 $^\circ$  alcohols: using Grignard reagent, Ester hydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk.  $\text{KMnO}_4$ , acidic dichromate, conc.  $\text{HNO}_3$ ). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

Phenols: (Phenol case) Preparation: Cumenehydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. Reimer-Tiemann Reaction, Gattermann-Koch Reaction, Houben-Hoesch Condensation, Schotten - Baumann Reaction.

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): (Formaldehyde, acetaldehyde, acetone and benzaldehyde)

Preparation: from acid chlorides and from nitriles.

Reactions - Reaction with HCN, ROH,  $\text{NaHSO}_3$ ,  $\text{NH}_2$ -G derivatives. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. Meerwein-Ponndorf-Verley reduction.

### **Suggested Readings:**

1. Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. Organic Chemistry, John Wiley & Sons, 2014.
2. McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
3. Finar, I.L. Organic Chemistry (Vol. I & II), E.L.B.S.
4. Morrison, R.T. & Boyd, R.N. Organic Chemistry, Pearson, 2010.
5. Bahl, A. & Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010.
6. Barrow, G.M. Physical Chemistry Tata McGraw-Hill, 2007.
7. Castellan, G.W. Physical Chemistry 4th Ed. Narosa, 2004.
8. Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning India Pvt. Ltd., New Delhi, 2009.
9. Petrucci, R.H. General Chemistry 5th Ed. Macmillan Publishing Co.: New York, 1985.

**Course Name: Chemistry -II Lab**

**Course Code: 13001100**

### **Objectives**

Syllabus deals with the practical aspects of the physical chemistry (thermodynamics portion and ionic equilibrium) and synthesis of some organic compounds covered during the lectures. These experiments give the conceptual understanding of the principles of the topics taught in

lectures. Student would gain the confidence over the fundamental principles of some important topics of physical and organic chemistry.

### **Course Outline**

#### **Section A: Physical Chemistry Thermochemistry**

1. Determination of heat capacity of calorimeter for different volumes
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts ( $\text{KNO}_3$ ,  $\text{NH}_4\text{Cl}$ )
5. Determination of enthalpy of hydration of copper sulphate
6. Study of the solubility of benzoic acid in water and determination of  $\Delta H$ . Ionic equilibria pH measurements a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter. b) Preparation of buffer solutions: (i) Sodium acetate-acetic acid (ii) Ammonium chloride-ammonium hydroxide Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

#### **Section B: Organic Chemistry**

1. Purification of organic compounds by crystallization (from water and alcohol) and distillation
2. Criteria of Purity: Determination of melting and boiling points
3. Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yields to be done. (a) Bromination of Phenol/Aniline (b) Benzoylation of amines/phenols (c) Oxime and 2,4-dinitrophenylhydrazone of aldehyde/ketone

#### **Suggested Readings:**

1. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996
2. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960
3. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).

## **Course Name: Plant Anatomy & Embryology**

**Course Code: 13007300**

### **Objectives**

- To observe and differentiate the variations existing in the internal structure of plants.
- To create interest in plant anatomy and to appreciate the function of a particular tissue or organ correlated with its structure.
- To enable the student understand the anatomical features within the system instead of merely memorizing the technical terms and the text book figures.
- To provide students with skills necessary to section and stain fresh plant material in preparation for study of plant anatomy.
- To train students in the proper use of the compound light microscope and to give them experience in interpreting images that they see through the microscope in terms of how plant structure is related to function.
- To provide students with skills in modern microscopic digital image capture, processing and analysis techniques useful in plant anatomical studies.
- To instill in students an appreciation for the complexity of tissue organization that exists within plant bodies that allow plants to develop and live as integrated organisms in diverse environments.

### **Course Outline**

#### **Unit I: Meristematic and permanent tissues**

Root and shoot apical meristems; Simple and complex tissues.

#### **Unit II: Organs**

Structure of dicot and monocot root stem and leaf.

#### **Unit III: Secondary Growth**

Vascular cambium – structure and function, seasonal activity. Secondary growth in root and stem, Wood (heartwood and sapwood).

#### **Unit IV: Adaptive and protective systems**

Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes.

#### **Unit V: Structural organization of flower**

Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac.

#### **Unit VI: Pollination and fertilization**

Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms.



**Unit VII: Embryo and endosperm**

Endosperm types, structure and functions; Dicot and monocot embryo; Embryoendosperm relationship.

**Unit VIII: Apomixis and polyembryony**

Definition, types and practical applications.

**Suggested Readings**

1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition.
2. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.

**Course Name: Plant Anatomy & Embryology Lab****Course Code: 13007400****Objectives**

The main purpose practical course is to learn the various techniques used in Botanical laboratory related to differential anatomical plant characteristics. The course would focus on the following objectives:

- To study the internal morphology of root, stem and leaf of angiosperms along with epidermal and mechanical tissue system
- To have the knowledge of normal secondary growth in stem, root of woody dicots and anomalous secondary growth in the stem of the Plants.
- Maceration of vascular tissue.
- Study of Garden tools and Equipment's.
- To explore the Phenology of fruits, vegetables or flowering crops.
- Preparation of different types of fruit products & Food products
- To explain the scope & importance of Anatomy and Embryology.
- Perform the techniques in anatomy.
- Deduce structure and development in microsporangium and megasporangium.
- To decipher the process of microsporogenesis and megasporogenesis.
- Know fertilization, endosperm and embryogeny process.

**Course Outline**

1. Study of meristems through permanent slides and photographs.
2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
3. Stem: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).

4. Root: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
5. Leaf: Dicot and Monocot leaf (only Permanent slides).
6. Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).
7. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides). Types of ovules: anatropous, orthotropous, circumscissile, amphitropous/ campylotropous. Female gametophyte: Polygonum (monosporic) type of Embryo sac Development (Permanent slides/photographs).
8. Ultrastructure of mature egg apparatus cells through electron micrographs.
9. Pollination types and seed dispersal mechanisms (including appendages, aril, caruncle) (Photographs and specimens).
10. Dissection of embryo/endosperm from developing seeds.
11. Calculation of percentage of germinated pollen in a given medium.

## **Course Name: Biochemistry & Metabolism**

### **Course Code: 13005900**

#### **Objective**

Biochemistry illuminates the fundamental unity of life, through the study of molecules and pathways and to the study of the structures, functions, and interactions between biological molecules forms the focus of the work of biochemists. The course aims to provide an advanced understanding of core principles and topics of Biochemistry and their experimental basis to enable the students to acquire a specialized knowledge and in-depth understanding of the subject. The course further endows a platform to students to identify the five classes of polymeric biomolecules and their monomeric building blocks and to describe how fats and amino acids are metabolized and explain how they can be used for fuel. Metabolism aims to provide important and cardinal issues of metabolic biological processes and acquisition of metabolic energy and to explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.

#### **Course Outline**

##### **Unit I: Introduction to Biochemistry**

A historical prospective. Amino acids & Proteins: Structure & Function. Structure and properties of Amino acids, Types of proteins and their classification, Forces stabilizing protein structure and shape. Different Level of structural organization of proteins, Protein Purification. Denaturation and renaturation of proteins.

Carbohydrates: Structure, Function and properties of Monosaccharides, Disaccharides and Polysaccharides. Homo & Hetero Polysaccharides, Mucopolysaccharides, Bacterial cell wall polysaccharides, Glycoprotein's and their biological functions.

## **Unit II: Lipids**

Structure and functions –Classification, nomenclature and properties of fatty acids, essential fatty acids. Phospholipids, sphingolipids, glycolipids, cerebrosides, gangliosides, Prostaglandins, Cholesterol.

Nucleic acids: Structure and functions: Physical & chemical properties of Nucleic acids, Nucleosides & Nucleotides, purines & pyrimidines, Biologically important nucleotides, Double helical model of DNA structure and forces responsible for A, B & Z – DNA, denaturation and renaturation of DNA.

## **Unit III: Enzymes**

Nomenclature and classification of Enzymes, Holoenzyme, apoenzyme, Cofactors, coenzyme, prosthetic groups, metalloenzymes, monomeric & oligomeric enzymes, activation energy and transition state, enzyme activity, specific activity, common features of active sites, enzyme specificity: types & theories, Biocatalysts from extreme thermophilic and hyperthermophilic archaea and bacteria. Role of: NAD<sup>+</sup>, NADP<sup>+</sup>, FMN/FAD, coenzymes A, Thiamine pyrophosphate, Pyridoxal phosphate, lipoic-acid, Biotin vitamin B12, Tetrahydrofolate and metallic ions

## **Unit IV: Carbohydrates Metabolism**

Reactions, energetics and regulation. Glycolysis: Fate of pyruvate under aerobic and anaerobic conditions. Pentose phosphate pathway and its significance, Gluconeogenesis, Glycogenolysis and glycogen synthesis. TCA cycle, Electron Transport Chain, Oxidative phosphorylation.  $\beta$ -oxidation of fatty acids

### **Suggested Readings:**

1. Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Biochemistry. VI Edition. W.H Freeman and Co.
2. Buchanan, B., Gruissem, W. and Jones, R. (2000) Biochemistry and Molecular Biology of Plants. American Society of Plant Biologists.
3. Nelson, D.L., Cox, M.M. (2004) Lehninger Principles of Biochemistry, 4th Edition, WH Freeman and Company, New York, USA.
4. Hopkins, W.G. and Huner, P.A. (2008) Introduction to Plant Physiology. John Wiley and Sons.
5. Salisbury, F.B. and Ross, C.W. (1991) Plant Physiology, Wadsworth Publishing Co. Ltd.

**Course Name: Biochemistry & Metabolism Lab**

**Course Code: 13006000**

### **Objectives**

Biochemistry lab will help the students to acquire extensive experience in the practice of science and learn about and perform qualitative tests to differentiate between different biomolecules, enzyme activity and the effect of atmospheric conditions on enzyme activity. 3. The lab aims to learn how to use basic laboratory skills and apparatus to obtain reproducible data from biochemical experiments and to analyze the biomolecules. The primary objective of the course is for students to learn fundamental approaches for experimentally investigating biochemical problems, and to provide the theoretical foundations for the methods used.

### **Course Outline**

1. To study activity of any enzyme under optimum conditions.
2. To study the effect of pH, temperature on the activity of salivary amylase enzyme.
3. Determination of - pH optima, temperature optima, Km value, Vmax value, Effect of inhibitor (Inorganic phosphate) on the enzyme activity.
4. Estimation of blood glucose by glucose oxidase method.
5. Principles of Colorimetry: (i) Verification of Beer's law, estimation of protein. (ii) To study relation between absorbance and % transmission.
6. Preparation of buffers.
7. Separation of Amino acids by paper chromatography.
8. Qualitative tests for Carbohydrates, lipids and proteins.

## **Course Name: Environmental Studies**

### **Course Code: 99001900**

### **Objectives**

- To understand the concept of multi-disciplinary nature of Environmental Science where different aspects are dealt with a holistic approach.
- Students will develop a sense of community responsibility by becoming aware of environmental issues in the larger social context.
- One must be environmentally educated
- To gain knowledge about environment and its conservation along with sustainable development.

### **Course Outline**

#### **Unit I: Introduction to environmental studies**

Multidisciplinary nature of environmental studies; Scope and importance; Need for public awareness. Ecosystems: What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the

following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

### **Unit II: Natural Resources**

Renewable and Non-renewable Resources, Land resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources : Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

### **Unit III : Biodiversity and Conservation**

Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

### **Unit IV: Environmental Pollution**

Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution Nuclear hazards and human health risks, Solid waste management: Control measures of urban and industrial waste. Pollution case studies.

Environmental Policies & Practices: Sustainability and sustainable development. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

### **Unit V : Human Communities and the Environment**

Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies. Disaster management: floods, earthquake, cyclones and landslides. Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Field work; Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds and basic principles of identification. Study of simple ecosystems-pond, river, Delhi Ridge, etc.

### **Suggested Readings:**

1. Bharucha, E. 2003, Textbook for Environmental Studies, University Grants Commission, New Delhi and Bharati Vidyapeeth Institute of Environmental Education and Research, Pune. 361.
2. Carson, Rachel. 1962. Silent Spring (Boston: Houghton Mifflin, 1962), Mariner Books, 2002
3. Economy, Elizabeth. 2010. The River Runs Black: The Environmental Challenge to China's Future.
4. Gadgil, M. & Ramachandra, G. 1993. This fissured land: an ecological history of India. Univ of California Press.
5. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
6. Grumbine, R. Edward, and Pandit, M.K. Threats from India's Himalaya dams. Science 339.6115 (2013): 36-37.
7. Heywood V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press.
8. McCully, P. 1996. Silenced rivers: the ecology and politics of large dams. Zed Books.
9. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
10. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders. 214
11. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic press, 2011.
12. Rao MN and Datta AK, 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.

### **Course Name: Ability and Skill Enhancement II**

**Course Code: 13002800**

#### **Objectives:**

To make the students acquainted with correct pronunciation and good at verbal communication and public speaking.

#### **Course Outline - Final Assessment - Debate/Group Discussion**

##### **Unit I: Phonetics**

Phonetic symbols and the International Phonetic Alphabets (IPA), The Description and Classification of Vowels (Monophthongs & Diphthong) Consonants, Phonetic Transcription & Phonology, Syllable, Stress & Intonations, Reading aloud, recording audio clips

## **Unit II: Vocabulary Building**

Idioms and Phrases Words Often Confused, One word Substitution, Word Formation: Prefix & Suffix.

## **Unit III: Ethics & Etiquettes**

What are ethics, what are values, difference between ethics and morals, Business ethics, workplace ethics, what are virtues for e.g. civic virtues, etc. Human ethics and values- 5 core human values are: right conduct, living in peace, speaking the truth, loving and care, and helping others.

Etiquette awareness, Importance of First Impression, Personal Appearance & Professional presence, Personal Branding, Dressing Etiquette, Dining Etiquette.

## **Unit IV: Reading & Writing Skills**

Reading Comprehension, News Reading, Picture Description, Paragraph Writing, News Writing.

## **Unit V : Listening & Speaking Skills**

Public Speaking, Debate, Inspirational Movie Screening, Skit Performance.

**Note:** The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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