



## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

SUBJECT CODE	Category	SUBJECT NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
HU201	II	Foundation English II	60	20	20	0	20	3	0	2	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

**\*Teacher's Assessment** shall be based upon following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

### .Course Educational Objectives (CEOs): The students will be able to:

- ) Participation in seminars, group discussions, paper presentation and general personal interactions at the professional level.
- ) Have adequate mastery over communicative english, reading and writing skills, secondarily listening and speaking skills.

### Course Outcomes (COs): The students should be able to:

- ) Improve their language skills, oral communication skills, group discussion skills, personal skills and confidence level.
- ) express his /her ideas and thoughts in speech or writing,
- ) Bridge the language gap vital to their success.
- ) Communicate effectively.

## COURSE CONTENTS:

### UNIT I

Communication: Objectives of Communication, Formal and Informal Channels of Communication, Advantages and Disadvantages, Extrapersonal communication, Interpersonal communication, Intrapersonal communication, Principles of communication.

  
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## UNIT II

Developing Reading Skills: Reading Comprehension, Process, Active & Passive reading, Reading speed Strategies, Benefits of effective reading, SQ3R Reading technique.

## UNIT III

Vocabulary Building: Using Dictionaries and Thesaurus, Synonyms, Antonyms, Homophones, One Word Substitution, Affixation: Prefixes & Suffixes, Derivation from root words, Jargon, Scientific Jargon, Word Formation.

## UNIT IV

Developing Writing Skills: Planning, Drafting and Editing, Developing Logical Paragraphs, Report Writing: Importance of Report, Characteristics of Good Report, Types of Report, Various Structures of a Report.

## UNIT V

Professional Skills: Negotiation Skills, Telephonic Skills, Interview Skills: Team building Skills and Time management

### Practical:

- ) Listening
- ) Linguistics and Phonetics
- ) Telephonic Conversation
- ) Mock Interviews
- ) Group discussions
- ) Extempore
- ) Debate
- ) Role Plays

### Suggested Readings

- ) Ashraf Rizvi.(2005).*Effective Technical Communication*. New Delhi:Tata Mc Graw Hill
- ) Prasad, H. M.(2001) *How to Prepare for Group Discussion and Interview*. New Delhi: Tata McGraw-Hill.
- ) Pease, Allan. (1998).*Body Language*. Delhi: Sudha Publications.
- ) Morgan, Dana (1998).*10 Minute Guide to Job Interviews*. New York: Macmillan.

  
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# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## B.Sc. (Life Science / Biotechnology / Chemistry)

### BSLS 202 Ecology, Biodiversity and Evolution

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSLS 202	DC	Ecology, Biodiversity and Evolution	60	20	20	30	20	4	1	2	7

Legends: L – Lectures; T – Tutorial/Teaching Assistant

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C<sub>2</sub> - Credit;

\*Teacher Assessment shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

#### Course Objective:

1. To give a comprehensive idea of origin and diversity of plants and animals
2. To give a comprehensive idea of ecological principle, natural environment and environmental pollution

#### Course Outcome:

1. Student will have the knowledge of evolution and diversity of plants and animals
2. Student will have the knowledge of ecological principles and natural environment
3. Student will be able to understand problems related to biological conservation and prevention of environmental pollution

#### A. Ecology

##### Unit - I

Ecosystem Concept and Structure; Trophic Levels - Producers, Consumers, Decomposers; Ecological Pyramids; Pyramids of Number, Biomass and Energy; Energy Flow in Ecosystem; Food Chains and Food Web; Biotic and Abiotic Factors of Ecosystem; Positive and Negative Biotic interactions

##### Unit - II

Ecological adaptations of hydrophytes, xerophytes and halophytes; Ecological succession: Primary and Secondary Succession; Hydrarch and Xerarch Succession; Biogeochemical cycles: Nitrogen, Carbon, Sulphur and Phosphorus cycles.

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**Unit – III**

Air Pollution; Climate Change; Green House Gases and Global Warming; Acid Rain; Ozone Depletion and Solar UV

Water Pollution; BOD; COD; Pollution by Heavy Metals, Pesticides; Waste water treatment

Solid Waste: Domestic, Hospital and Industrial

**B. Biodiversity and Evolution**

**Unit – IV**

Theories of Organic evolution: Lamarckism and Neo Lamarckism, Darwinism and Neo Darwinism, Germplasm theory, Mutation theory.

Origin of prokaryotic and eukaryotic cell; Gaia Hypothesis

Gene pool, Random genetic drift, Hardy Weinberg law

Isolation - types and mechanisms; Speciation

**Unit – V**


Plant Diversity: Major groups and salient features of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms

Animal Diversity: Major groups and salient features of Invertebrates and Vertebrates

**BSLSL205 Practical:**

1. Determination of frequency, density and abundance of vegetation by quadrat method.
2. Soil analysis (pH, temperature, moisture, inorganic content and bacterial count)
3. Isolation of symbiotic and non-symbiotic nitrogen fixing bacteria and actinomycetes from soil.
4. Determination of total organic component (TOC) in soil sample
5. Biotic components of pond
6. Water analysis (pH, DO, carbon dioxide and number of bacteria)
7. Determination of total dissolved solids (TDS) in water.
8. Determination of DO, BOD and COD of polluted and unpolluted water
9. Analysis of drinking water by MTT and MFT
10. Detection of fecal pollution of water by performing presumptive test, confirmed test and completed test.
11. Determination of MPN & coliforms in water
12. Bioremediation of waste water and its toxicity check

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13. Characterization of waste water:
  - a. Physical; odor, color, turbidity, temperature, salinity
  - b. Chemical; acidity, alkalinity, sulphate, copper
14. Estimation of alkaline and acid phosphatase activity of soil
15. Microbiological quality analysis of air.
16. Specimens / Slides of Plant diversity.
17. Specimens / Slides of Animal diversity.

**Books:**

1. Environmental Science: *A New Approach* .Dahiya, P.and Ahlawat, M. Narosa Publishers.
2. Ecology - Subrahmanyam, N.S. and Sambamurty, A. V. S. S. Narosa Publishing House.
3. Concepts of Ecology – Kormondy, E. J. Prentice Hall, USA, 5th Edition.
4. Ecology and Environment – Sharma P. D. Rastogi Publication, Meerut, India.
5. Biology – Raven P.H., Johnson G.B., Losos J.B. and Singer S.R. Tata McGraw Hill, Delhi, India.

  
Director,

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**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Degree Program B.Sc.**

**Semester-I (B.Sc.)**

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			THEORY			PRACTICAL		TH	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSPCH 103	DC	Physical Chemistry I	60	20	20	30	20	3	1	4	6

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**Physical Chemistry- I**

**Course Objectives:-**

To give basic knowledge of state of matter.

To understand and apply the knowledge of equilibria.

**Course Outcomes:-**

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes. The student will demonstrate capability of

CO1. Theoretical understanding of various state of matter.

CO2. Became aware of the importance of equilibria and its laws in the field of chemistry and dealing with its numerical approach.

**Unit I: Gaseous state:**

Kinetic molecular model of a gas; postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases, including their temperature and pressure dependence, relation between mean free path and coefficient of viscosity, calculation of  $\sigma$  from  $\eta$ ; variation of viscosity with temperature and pressure.

Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities.

Behavior of real gases : Deviations from ideal gas behavior, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. vander Waals equation of state, its derivation and application in explaining real gas behaviour.

  
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**Unit II: Liquid state:**

Qualitative treatment of the structure of the liquid state; Radial distribution function; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity. Explanation of cleansing action of detergents. Temperature variation of viscosity of liquids and comparison with that of gases. Qualitative discussion of structure of water.

**Unit III: Solid state:**

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, qualitative idea of point and space groups, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analysis of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals. Glasses and liquid crystals.

**Unit IV: 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; dissociation constants of mono-, di- and tri-protic acids (exact treatment). Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

**Unit V: Phase equilibria:**

Definitions of phase, component and degrees of freedom. Phase rule and its derivations. Definition of phase diagram. Phase equilibria for one component system – water, CO<sub>2</sub>. First order phase transition and Clapeyron equation; Clausius-Clapeyron equation - derivation and use. Solid-liquid phase diagram. Eutectic mixture.

**Recommended Texts:**

1. Atkins, P.W. & Paula, J. de Atkin's Physical Chemistry 8th Ed., Oxford University Press (2006).
2. Ball, D. W. Physical Chemistry Thomson Press, India (2007).
3. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
4. Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier; NOIDA, UP (2009).

  
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# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## B.Sc. (Life Science / Biotechnology / Chemistry)

### BSBT 204: Genetics and Molecular Biology

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSBT 204	DC	Genetics and Molecular Biology	60	20	20	30	20	4	1	2	7

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit,  
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#### Course Objectives:

1. To have the knowledge of principles of genetics
2. To have the knowledge of molecular biology and the role of macromolecules in transfer of genetic information

#### Course Outcomes:

1. Student will be able to understand the classical experiments of genetics that laid the foundations of genetic principles
2. Student will be able to understand the molecular nature of genes and techniques of transferring genes

#### A. Genetics

##### Unit - I

Mendelian Laws of genetics, Dominance, Segregation, Independent Assortment; Epistasis, Complementary ratio and supplementary ratio, Cytoplasmic inheritance; plastid and kappa particles.

Linkage and crossing over (Coupling and repulsion hypothesis) Mechanism of crossing over and its significance.

Mechanism of sex determination (Chromosomal theory), sex linked inheritance.

##### Unit - II

Structural and numerical chromosomal aberrations.

Chromosome related disorders: Klinefelter's syndrome, Turner's syndrome.

Down's syndrome and Cri-du-chat syndrome

Mutations- Spontaneous and induced, Chemical and physical mutagens.

Molecular basis of mutation.





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### B.Sc. (Life Science / Biotechnology / Chemistry)

#### B. Molecular Biology

##### Unit-III

Transformation, Conjugation and transduction in bacteria; Gene mapping in bacteria; Transcription, Translation, Processing of m-RNA, Splicing, DNA and RNA polymerases Prokaryotic and Eukaryotic Translation - Mechanism of initiation, elongation and termination.

Gene regulation in eukaryotic system Promoters, enhancers elements and gene amplification.

##### Unit-IV

Genetic engineering: Isolation of genomic and plasmid DNA from bacteria, Isolation of genomicDNA from plant and animal cells.

Recombinant DNA technology – cloning vectors (pUC 19, phage  $\lambda$ , cosmid and M13); Restrictionenzymes, introduction of DNA into living cells, methods of gene transfer, expression and detectionof clones.

##### Unit – V

Introduction to blotting technique: Western , Southern and Northern Blots.

#### BSBTL 206 Practical:

1. Isolation of DNA from bacterial cell
2. Isolation of DNA from plant cell
3. Isolation of DNA from animal cell
4. Isolation of plasmid DNA from bacteria and determination of its molecular weight by agarose gel method
5. Isolation of RNA from bacterial cell
6. Analysis of DNA by gel electrophoresis
7. UV as a physical mutagen
8. Genetic transformation of *E.coli* with standard plasmids and calculation of transformation efficiency
9. Development of antibiotic resistant bacterial strains using conjugation
10. Restriction digestion of DNA and agarose gel electrophoresis of fragments
11. Ligation of cleaved DNA fragments by using ligase enzyme
12. Artificial transformation of bacterial cells
13. Blue-white screening of recombinants
14. Amplification of  $\beta$ -galactosidase gene in *E.coli* using PCR
15. RFLP and DNA finger printing
16. Steps in cloning using GFP (Green Fluorescent Protein) gene
17. Southern Blotting

#### Books

1. Lewin, B., Genes VII, Oxford University Press.
2. Strickberger M. W. [2002], Genetics – Prentice Hall, India.
3. Brown T. A., Genetics; a molecular approach – Chapman & Hall, London.
4. Erielfelder, D., Molecular Biology, Jones & Bartlett Publishers.

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