



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Social Sciences, Humanities and Arts**  
**Choice Based Credit System (CBCS) in Light of NEP-2020**  
**Humanities (Common Course)**  
**Semester II (Batch 2021-24)**

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
HU201	AECC	Foundation English II	60	20	20	-	50	3	0	2	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - 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 Educational Objectives (CEOs): The students will**

- CEO1 Understand the role and types of workplace communication
- CEO2 Read their texts for understanding for pleasure and business purpose.
- CEO3 Understand language, word relationships and nuances in word meanings.
- CEO4 Recall key elements of structure and style in drafting technical reports
- CEO5 Develop competency in professional communication.

**Course Outcomes (COs): The students will be able to**

- CO1 Discuss the role and types of workplace communication
- CO2 Practice reading based on comprehension of a text.
- CO3 Use resources to increase vocabulary and gain deeper understanding by using context of words and sentences.
- CO4 Write according to standard principles of structure, style, and English-language mechanics.
- CO5 Demonstrate different strategies for using professional communication skills.

**Paper I**  
**HU201**  
**Foundation English II**

**COURSE CONTENTS**

**UNIT I**

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



**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Social Sciences, Humanities and Arts**  
**Choice Based Credit System (CBCS) in Light of NEP-2020**  
**Humanities (Common Course)**  
**Semester II (Batch 2021-24)**

Semester II (Batch 2021-24)											
COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
HU201	AECC	Foundation English II	60	20	20	-	50	3	0	2	4

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

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

**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



**Chairperson**

Board of Studies

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Chairperson**

Faculty of Studies

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Controller of Examination**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Joint Registrar**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Social Sciences, Humanities and Arts**  
**Choice Based Credit System (CBCS) in Light of NEP-2020**  
**Humanities (Common Course)**  
**Semester II (Batch 2021-24)**

Semester II (Batch 2021-24)											
COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two-Term Exam	Teachers Assessment <sup>a</sup>	END SEM University Exam	Teachers Assessment <sup>a</sup>				
HU201	AECC	Foundation English II	60	20	20	-	20	3	0	2	4

Legends: L - Lecture, T - Tutor, P - Teacher Guided Student Activity, F - Practical, C - Credit.

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

**Suggested Readings**

- Allen, R. (2005). *Effective Technical Communication*. New Delhi: McGraw Hill.
- Price, L. M. (2001) *How to Prepare for Group Discussion and Interview*. New Delhi: Thomson McGraw-Hill.
- Penne, A. (1978). *Body Language*. Delhi: Sadha Publications.
- Morgan, Dana (1998) *10 Minute Guide to Job Interviews*. New York: Macmillan.

**Chairperson**

Board of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

**Chairperson**

Faculty of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

**Controller of Examination**

Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

**Joint Registrar**

Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya

## B.Sc. (Chemistry Hons)

### Choice Based Credit System (CBCS)

#### Semester-II (B.Sc. - Honours) Chemistry

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSHCH 202	HONS	INDUSTRIAL ASPECTS OF PHYSICAL CHEMISTRY	4	0	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; Q/A - Quiz/Assignment/Attendance, MST Mid Sem Test.

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

#### Course Objectives:

1. To develop the understanding of fundamentals of Thermodynamics & its applications.
2. To give basic knowledge of Chemical equilibrium, Solution and Electrochemistry.

#### Course Outcomes:

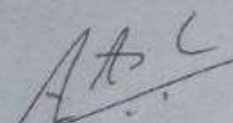
After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes. The student will demonstrate capability of


- CO1. Theoretical understanding of fundamentals of Thermodynamics & its applications.  
 CO2. Understanding of adsorption isotherms.  
 CO3. Understanding the basics of chemical kinetics and application of steady state kinetics. Steady-state approximation. the learner can be able to understand: Basic principle of laws of electrochemistry. EMF measurement. Catalyst - mechanism, acid base catalysis, enzyme catalysis.  
 CO4. Demonstrate a fundamental/systematic understanding of the practical field of Physical Chemistry

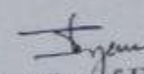
#### SYLLABUS:

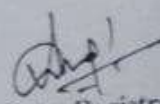
##### Unit-I : Thermochemistry and Its applications

Thermochemistry: Heats of reactions: standard states; enthalpy of formation and enthalpy of combustion and its applications; effect of temperature (Kirchhoff's equations) and pressure on enthalpy of reactions.

  
 Chairperson  
 Board of Studies  
 Physical Sciences

  
 Chairperson  
 Faculty of Studies  
 Science

  
 Controller of Examinations  
 SVVV, Indore

  
 Joint Registrar  
 SVVV Indore

## Semester-II (B.Sc. - Honours) Chemistry

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSHCH 202	HONS	INDUSTRIAL ASPECTS OF PHYSICAL CHEMISTRY	4	0	0	4	60	20	20	0	0

### Unit II: Adsorption:

Physisorption and Chemisorption, Applications of adsorption, Adsorption of gases by solids, Freundlich adsorption isotherm, Langmuir's theory of adsorption, BET theory of multilayer adsorption, Determination of surface area, Adsorption isotherms.

### Unit-III : Chemical Kinetics

Rate of a reaction- factors influencing the rate of a reaction such as concentration, temperature, pressure, solvent, light and catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions - zero order, first order, second order, pseudo-order, half-life, and mean life. Determination of the order of reaction - differential method, method of integration, method of half-life period and isolation method. Radioactive decay as a first order phenomenon. Experimental methods for the studies of chemical kinetics.

### Unit- IV :Electrochemistry:

Electrical transport - conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution. Migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Applications of conductivity measurements: determination of degree of dissociation, determination of  $K_a$  of acids, determination of solubility product of a sparingly soluble salt.

### Unit-V : Corrosion and its control and Catalysis:

#### Corrosion and its control:

Introduction, Economic aspects of corrosion, Dry or Chemical Corrosion, Wet or electrochemical corrosion, Mechanism of Electrochemical Corrosion, Prevention from corrosion.

**Catalysis:** Characteristics of catalysed reactions, classification of catalysis, Industrial catalysts and enzyme kinetics.

#### **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).

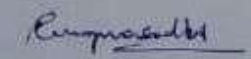
#### **List of Practical's:** (If Practical Credit Shown in Syllabus)

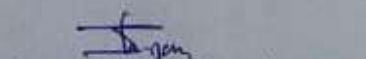
#### **Guidelines for Practical:**

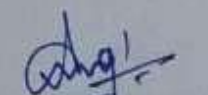
One credit lab is to be conducted by covering the most relevant and useful topics from mentioned syllabus

  
Chairperson

Board of Studies  
Physical Sciences Science

  
Chairperson  
Faculty of Studies

  
Controller of Examinations  
SVVV, Indore

  
Joint Registrar  
SVVV Indore





# Shri Vaishnav Vidyapeeth Vishwavidyalaya

## B.Sc. (Chemistry Hons)

### Choice Based Credit System (CBCS)

#### Semester-II (B.Sc. - Honours) Chemistry

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSHCH203	Hons	Concepts of Organic Chemistry	5	0	0	5	60	20	20	0	0

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

To give basic knowledge of concept of organic chemistry.  
 To develop the understanding of Chemistry of Aliphatic Hydrocarbons

#### 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. Basic of organic molecules, structure, bonding, reactivity, and reaction mechanisms. Stereochemistry of organic molecules – conformation and configuration, asymmetric molecules, and nomenclature.

CO2. Understanding hybridization and geometry of atoms, 3-D structure of organic molecules, identifying chiral centres. Became aware of the Chemistry of Aliphatic Hydrocarbons.

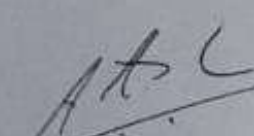
CO3. Understanding Electrophile, nucleophiles, free radicals, electronegativity, resonance, and intermediates along the reaction pathways. Mechanism of organic reactions.


CO4. Demonstrate a fundamental/systematic understanding of the practical field of Organic Chemistry

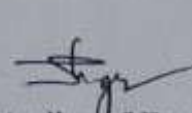
#### SYLLABUS:


##### Unit-I: Basics of Organic Chemistry

Electronic Displacements: Inductive, electrometric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength. Homolytic and Heterolytic fission with suitable examples. Curly arrow rules, formal charges; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape, and their relative stability of Carbocations, Carbanions, Free radicals, and Carbenes Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

  
 Chairperson  
 Board of Studies  
 Physical Sciences

  
 Chairperson  
 Faculty of Studies  
 Science

  
 Controller of Examinations  
 SVVV, Indore

  
 Joint Registrar  
 SVVV Indore

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSHCH203	Hons	Concepts of Organic Chemistry	5	0	0	5	60	20	20	0	0

### Unit II: Stereochemistry

Fischer Projection, Newmann and Sawhorse Projection formula and their interconversions. Geometrical isomerism: cis-trans and, syn-anti isomerism E/Z notations with C.I.P rules. Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with two or more chiral-centres, Distereoisomers, meso structures, Racemic mixture, and resolution. Relative and absolute configuration: D/L and R/S designation.

### Unit III: Chemistry of Aliphatic Hydrocarbons

**A.** Carbon-Carbon sigma bonds Chemistry of alkanes: Formation of alkanes, Wurtz- Fittig Reactions, Free radical substitutions: Halogenation - relative reactivity and selectivity.  
**B.** Carbon-Carbon pi bonds Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroboration-oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

### Unit IV: Cycloalkanes and Conformational Analysis

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes: Relative stability: Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms; Relative stability with energy diagrams.

### Unit V: Aromatic Hydrocarbons

Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation, and Friedel-Craft's alkylation/acylation with their mechanism. Directing effects of the groups.

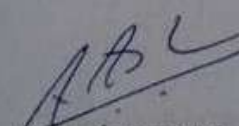
### **Recommended Texts:**

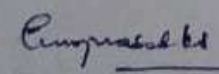
1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Cary, Sundberg A., Organic chemistry, Voll & 2, Wiley Interscience, New York (2005)

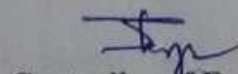
### **List of Practical's:** (If Practical Credit Shown in Syllabus)

### **Guidelines for Practical:**

One credit lab is to be conducted by covering the most relevant and useful topics from mentioned syllabus

  
**Chairperson**  
**Board of Studies**  
**Physical Sciences Science**

  
**Chairperson**  
**Faculty of Studies**

  
**Controller of Examinations**  
**SVVV, Indore**

  
**Joint Registrar**  
**SVVV Indore**





Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Science

Department of Physics


Choice Based Credit System (CBCS)


B. Sc. II Sem

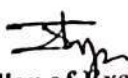
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem Univer sity Exam	Two Term Exam	Teac hers Asses sment	End Sem Unive rsity Exam	Tea cher s Asses sment				
BSPH202	DC	Waves and Optics	60	20	20	30	20	4	0	0	4

Course Objectives	<ol style="list-style-type: none"><li>1. To develop the comprehensive understanding of laws of physics related to Waves and Optics and ability to apply them for laying the foundation for research and development.</li><li>2. To work ethically as member as well as leader in a diverse team.</li></ol>
Course Outcomes	<ol style="list-style-type: none"><li>1. Student will be able to understand and solve the problems related to Waves and Optics.</li><li>2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.</li></ol>

Abbreviation		Teacher Assessment (Theory) shall be based on following components: Quiz/Assignment/Project/ Participation in class (Given that no component shall be exceed 10 Marks).
Th	Theory	Teacher Assessment (Practical) shall be based on following components: Viva/ File/ Participation in Lab work (Given that no component shall be exceed 50% of Marks).
T	Tutorial	
P	Practical	

  
Chairperson  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore





Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Science

Department of Physics

Choice Based Credit System (CBCS)

BSPH 202: Waves and Optics

#### UNIT I: Waves

Wave motion, one dimensional wave equation and solution, speed of transverse waves in a uniform stretched string, speed of longitudinal waves in a fluid and gases, speed of longitudinal waves in a solid, variation in velocity and pressure in a plane progressive wave, Energy, Energy density of a progressive wave and intensity of a wave, waves on liquid surface, gravity waves and ripples, phase velocity and group velocity.

#### UNIT II: Interference of light

Condition of constructive and destructive interference, necessary condition of interference, Interference of light by division of wave front: Fresnel's Bi-Prism, shape of biprism fringes, Interference by division of amplitude, interference in thin films, path difference, phase difference due to reflection from denser medium: Stokes law, localized fringes, Newton's rings and applications, Haidinger fringes (Fringes of equal inclination), Michelson interferometer and its application.

#### UNIT III: Diffraction

Fraunhofer's diffraction at a single slit, double slit, plane transmission grating, n-slit diffraction, formation of spectra by the grating, determination of wavelength of light by with a grating, resolving power of an optical instruments, Rayleigh criterion of resolution of images. Resolving power of plane transmission grating.

#### UNIT IV: Polarization

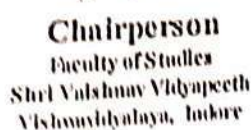
Polarization of light, production of plane polarized light by reflection; Brewster law, Production of plane polarized light by double refraction: double refraction in uniaxial crystal, Huygens explanation of double refraction, calcite crystal, Nicol prism, quarter and half wave plates, circularly and elliptically polarized light, analysis of polarized light, rotation of plane of polarization, polarimeter, Laurent's half shade device.

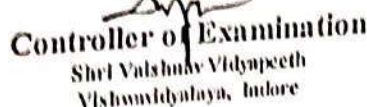
#### UNIT V: Laser

Stimulated and Spontaneous Emission, Einstein's A & B Coefficients, Population Inversion, Pumping, Techniques of Pumping, Two three and four level lasers. Optical Resonator, Properties and Applications of Laser, Ruby Laser, Nd:YAG Laser, He-Ne Laser, CO<sub>2</sub> Lasers.

  
Chairperson

Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Science

Department of Physics

Choice Based Credit System (CBCS)


BSPH 202: Waves and Optics

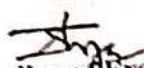
References:

1. F. A. Jenkins and H. E. White, *Fundamentals of Optics*, 4<sup>th</sup> Edition, McGraw-Hill Higher Education, 2001.
2. F. S. Crawford Jr., *Waves, Berkeley Physics Course*, Vol. 3, Mc-Graw Hill Education, 1968.
3. M. Born and E. Wolf, *Principles of Optics*, 7<sup>th</sup> Edition, Cambridge University Press, 2003.
4. K. Thyagarajan and A. Ghatak, *Lasers: Fundamentals and Applications*, 2<sup>nd</sup> Edition, Springer Science + Business Media, 2010.
5. B. K. Mathur, *Principles of Optics*, 2<sup>nd</sup> Edition, Gopal Printing Press, 1970.
6. H. D. young, R. A. Freedman, R. Bhathal and A. L. ford, *Sears and Zemansky's University Physics with Modern Physics*, 1<sup>st</sup> Australian SI Edition, Pearson Education Inc, 2011.
7. D. P. Khandelwal, *Textbook of Optics and Atomic Physics*, Himalaya Publishing House, 1989.
8. A. K. Ghatak, *Optics*, 6<sup>th</sup> Edition, McGraw Hill Education (India), 2017.

  
Chairperson

Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore





# Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program : B.Sc. Physics (Honors)/ Chemistry (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCS203	COMPU LSORY	Object Oriented Programmin g with C++	60	20	20	0	0	4	0	0	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

**\*Teacher Assessment** shall be based on following components:

Quiz/Assignment/project/Participation in class (Given that no component shall be exceed 10 Marks)

### Course Educational Objectives(CEOs):

- To familiarize the students with programming and to encourage them to develop their logic.
- To make students well versed with C++ language to solve problems efficiently.
- Using simple and well drawn illustrations develop their programming skills using modular programming.

**Course Outcomes (COs):** Student will be able to:

- Develop algorithms for problems.
- To understand the object Oriented paradigm
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- Write the programs using pointers and to manage memory.
- To apply the knowledge of Object Oriented Methodology to write reusable code.
- Implement programs of file handling.

### UNIT I

**Object-Oriented Programming Concepts:** Introduction, comparison between procedural

**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program : B.Sc. Physics (Honors)/ Chemistry (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCS203	COMPU LSORY	Object Oriented Programmin g with C++	60	20	20	0	0	4	0	0	4

programming paradigm and object-oriented programming paradigm, basic concepts of object-

oriented programming — concepts of an object and a class, interface and implementation of a class, operations on objects, relationship among objects, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, messaging.

### UNIT II

**Standard Input/output:** Concept of streams, hierarchy of console stream classes, input/output using overloaded operators >> and << and member functions of i/o stream classes, formatting output, formatting using ios class functions and flags, formatting using manipulators.

### UNIT III

**Classes and Objects:** Specifying a class, creating class objects, accessing class members, access specifiers, and static members, use of const keyword, friends of a class, empty classes, nested classes, local classes, abstract classes, container classes, bit fields and classes.

### UNIT IV

**Pointers and Dynamic Memory Management:** Declaring and initializing pointers, accessing data through pointers, pointer arithmetic, memory allocation (static and dynamic), dynamic memory management using new and delete operators, pointer to an object, this pointer, pointer related problems - dangling/wild pointers, null pointer assignment, memory leak and allocation failures.

### UNIT V

**Constructors and Destructors:** Need for constructors and destructors, copy constructor, dynamic constructors, explicit constructors, destructors, constructors and destructors with static members, Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type

**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore





# Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program : B.Sc. Physics (Honors)/ Chemistry (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCS203	COMPU LSORY	Object Oriented Programmin g with C++	60	20	20	0	0	4	0	0	4

### Text Books

- Lafore R. “Object Oriented Programming in C++”, Galgotia Pub.
- Lee “UML & C++ a practical guide to Object Oriented Development 2 ed, Pearson.
- Scheildt “C++ the complete reference 4ed, 2003.
- Hans Erit Eriksson, “UML 2 toolkit” Wiley.
- Balagurusawmy , “Object Orienter Programming with C++”.

### References

- B.G., Boach “Object Oriented Analysis & Design with Applications”, Addison Wesley.
- S. Parate “C++ Programming”, BPB. 8. Boggs “Mastering UML” BPB Publications.
- Mastering C++ by Venugopal TMH

**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program : B.Sc. Physics (Honors)/ Chemistry (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCL208	COMPU LSORY	C++ Lab	0	0	0	30	20	0	0	2	1

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

**\*Teacher Assessment** shall be based on following components:

Quiz/Assignment/project/Participation in class (Given that no component shall be exceed 10 Marks)

### Course Educational Objectives(CEOs):

- To familiarize the students with programming and to encourage them to develop their logic.
- To make students well versed with C++ language to solve problems efficiently.
- Using simple and well drawn illustrations develop their programming skills using modular programming.

**Course Outcomes (COs):** Student will be able to:

- Develop algorithms for problems.
- To understand the object Oriented paradigm
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- Write the programs using pointers and to manage memory.
- To apply the knowledge of Object Oriented Methodology to write reusable code.
- Implement programs of file handling.

**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore





# Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program : B.Sc. Physics (Honors)/ Chemistry (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCL208	COMPU LSORY	C++ Lab	0	0	0	30	20	0	0	2	1

### Practical's List

1. Write a program in C++ using (i) if-then-else (ii) loops
2. Write a program illustrate Function in C++
3. Write a program for Operator overloading in C++
4. Write a program for nested function call.
5. Write a program of call by value using C++
6. Write a program of call by reference using C++
7. Write a program for Inline Function.
8. Write a program for Friend Function.
9. Write a program of dynamic memory management using new and delete.
10. Write a program on file handling using C++
11. Write a program to demonstrate the use of zero argument and parameterized constructors.
12. Write a program to demonstrate the use of dynamic constructor.
13. Write a program to demonstrate the use of explicit constructor.
14. Write a program to demonstrate the overloading of increment and decrement operators.
15. Write a program to demonstrate the overloading of binary arithmetic operators.
16. Write a program to demonstrate the typecasting of basic type to class type.

**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program : B.Sc. Physics (Honors)/ Chemistry (Honors)

17. Write a program to demonstrate the typecasting of class type to basic type.
18. Write a program to demonstrate the multilevel inheritance.
19. Write a program to demonstrate the multiple inheritance.
20. Write a program to demonstrate the virtual derivation of a class.
21. Write a program to demonstrate the runtime polymorphism.

### Text Books

1. `Fundamentals of Computers : E Balagurusamy, TMH
2. Fundamentals of Computers : V Rajaraman, PHI
3. Yashavant P. Kanetkar. "Let Us C", BPB Publications, 2011.
4. Robert Lafore, "Object Oriented Programming in C++", SAMS Publication.

### References

1. Fundamentals of Computers : E Balagurusamy, TMH
2. Basic Computer Engineering: Silakari and Shukla, Wiley India
3. Fundamentals of Computers : V Rajaraman, PHI
4. Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya PHI.

**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## B.Sc. Chemistry Honours

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*				
BSBT 205	DC	Molecular Biology	60	20	20	30	20	3	0	2	4

### BSBT 205: Molecular Biology

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

## SYLLABUS

### Unit – I

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





# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## B.Sc. Chemistry Honours

### Unit - II

Gene regulation in eukaryotic system – Promoters, enhancers elements and gene amplification.  
Genetic engineering: Isolation of genomic and plasmid DNA from bacteria, Isolation of genomic DNA from plant and animal cells.

### 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.

### Unit-IV

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

### Unit – V

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

### 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 GPF (Green Fluorescent Protein) gene
17. Southern Blotting



# **Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**

## **B.Sc. Chemistry Honours**

### **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. Friefelder, D., Molecular Biology, Jones & Bartlett Publishers.



## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

### Name of the Program: B. Sc. (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSHMA204	BS	Vector Algebra and Differential Calculus	60	20	20	-	-	4	0	-	4

### Course Objective

*To introduce the students with the Fundamentals of the Vector Algebra and Differential Calculus.*

### Course Outcomes

*This course will enable the students to:*

- 1. Understand and apply the basics of the Vector Algebra.*
- 2. Know the fundamental principles of the algebra of the real numbers and sequences.*
- 3. Apply the techniques to test the convergence and the divergence of an infinite series.*
- 4. Apply the basic principles of the Differential Calculus of single real variable.*
- 5. Adopt the Calculus of more than one real variable.*


### Course Content:

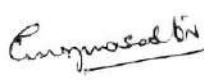
#### UNIT – I

**Vector Algebra:** Addition of Vectors. Multiplication of a Vector by a scalar. Collinear and Coplanar Vectors. Scalar and Vector products of two and three vectors. Simple applications to problems of Geometry. Vector equation of plane and straight line. Volume of Tetrahedron. Applications to problems of Mechanics (Work done and Moment).


#### UNIT – II

**Differential Calculus:** Rational Numbers. Geometrical representation. Irrational number. Real

  
Chairperson  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore





## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

### Name of the Program: B. Sc. (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSHMA204	BS	Vector Algebra and Differential Calculus	60	20	20	-	-	4	0	-	4

number represented as point on a line – Linear Continuum. Acquaintance with basic properties of real number (No deduction or proof is included). **Sequence:** Definition of bounds of a sequence and monotone sequence. Limit of a sequence. Statements of limit theorems. Concept of convergence and divergence of monotone sequences – applications of the theorems, in particular, definition of  $\epsilon$ . Statement of Cauchy's general principle of convergence and its application.

#### UNIT – III

**Infinite series of constant terms:** Convergence and Divergence (definitions). Cauchy's principle as applied to infinite series (application only). Series of positive terms: Statements of Comparison test, D'Alembert's Ratio test. Cauchy's  $n$ th root test and Raabe's test – Applications. Alternating series: Statement of Leibnitz test and its applications. **Real-valued functions defined on an interval:** Limit of a function (Cauchy's definition). Algebra of limits. Continuity of a function at a point and in an interval. Acquaintance (no proof) with the important properties of continuous functions on closed intervals. Statement of existence of inverse function of a strictly monotone function and its continuity.

#### UNIT – IV

**Derivative:** Its geometrical and physical interpretation. Sign of derivative – Monotonic increasing and decreasing functions. Relation between continuity and derivability. Differential – application in finding approximation. **Successive derivative:** Leibnitz's Theorem and its application. Application of the principle of Maxima and Minima for a function of single variable in geometrical, physical and other problems. **Applications of Differential Calculus:** Tangents and Normals, Pedal equation and Pedal of a curve. Rectilinear Asymptotes (Cartesian only).

#### UNIT – V

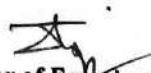
Statement of Rolle's theorem and its geometrical interpretation. Mean Value Theorems of Lagrange and Cauchy. Statements of Taylors and Maclaurin's Theorems with Lagrange's and Cauchy's form of remainders. Taylor's and Maclaurin's Infinite series for functions like  $e^x$ ,  $\sin x$ ,  $\cos x$ .  $(1+x)^n$ ,  $\log(1+x)$  [with restrictions wherever necessary]. **Indeterminate Forms:** L'Hospital's Rule: Statement and problems only. **Functions of two and three variables:** Their geometrical representations. Limit and Continuity (definitions only) for functions of two variables. Partial derivatives: Knowledge and use of Chain Rule. Exact differentials (emphasis on solving problems only).



Chairperson  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Name of the Program: B. Sc. (Honors)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSHMA204	BS	Vector Algebra and Differential Calculus	60	20	20	-	-	4	0	-	4

### BOOKS:

1. Vector Analysis – Louis Brand.
2. Vector Analysis – Barry Spain.
3. Vector & Tensor Analysis – Spiegel (Schaum).
4. Elementary Vector Analysis – C. E. Weatherburn (Vol. I & II).
5. Basic Real & Abstract Analysis – Randolph J. P. (Academic Press).
6. A First Course in Real Analysis – M. H. Protter & G. B. Morrey (SpringerVerlag, NBHM).
7. A Course of Analysis – Phillips.
8. Problems in Mathematical Analysis – B. P. Demidovich (Mir).
9. Problems in Mathematical Analysis – Berman (Mir).
10. Differential & Integral Calculus (Vol. I & II) – Courant & John.

Chairperson  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore