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 I (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*				
HU101	AECC	Foundation English I	60	20	20	0	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

- **CEO 1** Understand the different nuances of communication.
- **CEO2** understand the features of listening skill.
- **CEO3** Comprehend the factors that influence use of grammar and vocabulary in speech and writing
- **CEO4** study the essential aspects of effective written communication through Business letters and email writing for professional success.
- **CEO5** Identify other common methods of professional communication

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

- **CO1** develop a comprehensive understanding of the theoretical and practical aspects of communication.
- **CO2** explain the difference between listening and hearing and understand the value of listening.
- **CO3** Apply grammatical rules in speech and writing.
- **CO4** Use proper formats of written business communication.
- **CO5** Use appropriate organization and order of words, sentences and paragraphs in technical writing.

Paper I
HU101
Foundation English I

COURSE CONTENTS

UNIT I
Communication: Nature, Meaning, Definition, Process, Functions and importance, Characteristics of Business Communication, Verbal and Non-Verbal Communication, Barriers to Communication.

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Humanities (Common Course)
Semester I (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*				
HU101	AECC	Foundation English I	60	20	20	0	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
Listening: Process, Types, Difference between Hearing and Listening, Benefits of Effective Listening, Barriers to Effective Listening, Overcoming Listening Barriers, and How to Become an Effective Listener

UNIT III
Basic Language Skills: Grammar and usage- Parts of Speech, Tenses, Subject and Verb Agreement, Prepositions, Articles, Types of Sentences, Direct - Indirect, Active - Passive voice, Phrases & Clauses.

UNIT IV
Business Correspondence: Business Letters, Parts & Layouts of Business Letter, Job application and Resume, Application Calling/ Sending Quotations/ Orders/ Complaints. E-mail writing, Email etiquettes

UNIT V
Précis Writing and Noting: The Purpose of Notes, Methods of Notetaking, General Principles of Good Notes. Drafting: Notices, Agenda and Minutes. Advertisement: Importance, Types, Various Media of Advertising, Slogan Writing.

Practicals

- Self Introduction
- Reading Skills and Listening Skills
- Linguistics and Phonetics
- Role plays
- Oral Presentation – Preparation & Delivery using audio – visual aids with stress on body language and voice modulations.
- Social etiquettes

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Humanities (Common Course)
Semester I (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*				
HU101	AECC	Foundation English I	60	20	20	0	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.

Suggested Readings:

- Adair, John (2003). **Effective Communication**. London: Pan Macmillan Ltd.
- A.J. Thomson and A.V. Martinet (1991). **A Practical English Grammar** (4th ed). New York: Ox- ford IBH Pub
- Ashraf Rizvi. (2005). **Effective Technical Communication**. New Delhi: Tata Mc Graw Hill
- Kratz, Abby Robinson (1995). **Effective Listening Skills**. Toronto: ON: Irwin Professional Publishing.

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Name of the Program: B. Sc. (Mathematics Honours)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 102	DC	Algebra I (Basic Algebra)	60	20	20	-	-	4	1	-	5

Course Objective

To introduce the students with the Fundamentals of the Classical Algebra

Course Outcomes

After the successful completion of this course students will be able to:

1. *know the fundamental principles of the algebra of the complex numbers.*
2. *apply the techniques to find the roots of an equation after knowing the relation between the roots and the coefficients.*
3. *know and apply the basic principles of the Modular Mathematics.*
4. *understand and apply the basics of the Group Theory.*

Course Content:

UNIT – I

Relations, Partial Order Relation, Equivalence Relation and Partitions, Functions, Composition of functions, Invertible functions, Cardinality, Countable and Un-countable sets, A review of modular arithmetic.

UNIT – II

Descartes Rule of signs, Sturm's theorem and their applications. Multiple roots. Relation between roots and coefficients. Symmetric functions of roots. Quick review of algebra of complex numbers including De-Moivre's Theorem.

UNIT – III

Symmetries of a square, Dihedral groups, definition and examples of groups and elementary properties of groups.

UNIT – IV

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Name of the Program: B. Sc. (Mathematics Honours)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 102	DC	**Algebra I (Basic Algebra)**	60	20	20	-	-	4	1	-	5

Subgroup and its examples, Order of group and its elements, Cosets, Lagrange's Theorem, Euler's Theorem and Fermat's Theorem.

UNIT – V

Normal Subgroup, Quotient group, Cyclic group, Properties of Cyclic Groups.

Reference Books:

1. John B. Fraleigh, A First Course in Abstract Algebra, Narosa Publication.
2. Joseph A. Gallian, Contemporary Abstract Algebra, Cengage Learning.
3. M. Artin: Algebra, Pearson.
4. S. D. Dummit and M. R. Foote: Abstract Algebra, John Wiley.
5. I.N. Herstein: Topics in Algebra, Wiley.
6. N.S. Gopalkrishnan, University Algebra, John Wiley & Sons.
7. P.B. Bhattacharya, Basic Abstract Algebra, Cambridge University Press.
8. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers Delhi.

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Name of the Program: B. Sc. (Mathematics Honours)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 103	DC	**Analysis I**	60	20	20	-	-	4	1	-	5

Course Objective

To introduce the students with the Fundamentals of the Mathematical Analysis

Course Outcomes

After the successful completion of this course students will be able to:

1. *understand the basics of the Real Analysis.*
2. *analyse and solve the fundamental problems of the convergence of a series.*
3. *apply the fundamentals of Calculus.*
4. *justify the concepts and role of the Real Analysis.*

Course Content:

UNIT – I

Real numbers, Sequences, Bounded and Unbounded Sequences , Monotone sequences and their convergence, Limit Supremum, Limit Infimum and convergence criterion using them, Subsequences, Cauchy sequence and their convergence criterion.

UNIT – II

Series of non-negative terms, Infinite series and their convergence, Geometric series, p-series test, Comparison test, Ratio and root tests, Raabe's test, Logarithmic test, Bertrand test, Condensation test and Integral test, Absolute and conditional convergence, Alternating series and Leibnitz's theorem.

UNIT – III

Differentiation, Chain rule, Rolle's theorem, Mean value theorem, Higher order derivatives. Successive Differentiation, Leibnitz formula, Maclaurin's and Taylor's series expansion.

UNIT – IV

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Name of the Program: B. Sc. (Mathematics Honours)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 103	DC	**Analysis I**	60	20	20	-	-	4	1	-	5

Reduction formulae and evaluation of Integrals by using Beta and Gamma functions.

UNIT – V

Tangents and Normals, Curvature, Radius of curvature: Cartesian and polar curves.

Reference Books :

1. W. Rudin: Principles of Mathematical Analysis, Mac Graw Hill Education.
2. Tom Apostol: Mathematical Analysis, Pearson.
3. Tom Apostol: Calculus I and II, Pearson.
4. Terence Tao : Analysis I, Hindustan Book Agency.
5. W. Rudin: Real and Complex Analysis, Mac Graw Hill Education.
6. Gorakh Prasad, Differential Calculus, Pothishala pvt. Ltd. Allahabad.

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B.Sc. Phys. Hons. I Sem

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSPH102	DC	General Properties of Matter	60	20	20	30	20	4	0	0	4

Course Objectives	1. To develop the comprehensive understanding of laws of physics related to General Properties of Matter and ability to apply them for laying the foundation for research and development. 2. To work ethically as member as well as leader in a diverse team.
Course Outcomes	1. Student will be able to understand and solve the problems related to General Properties of Matter. 2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

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

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Choice Based Credit System (CBCS)

BSPH102: General Properties of Matter

UNIT I: System of many particles

System of particles and equation of motion, Centre of mass for a system of particles, motion of the center of mass, law of conservation of linear momentum for a system of one, two, n particles, law of conservation of angular momentum for a single particle, system of n particles and examples, recoil velocity on firing a bullet from a gun, motion of a boat or propulsion of an Aeroplane, jet propulsion, motion of rocket. Kepler's law of planetary motion.

UNIT II: Rotational Dynamics

Motion of rigid body, rotatory motion, equations of rotationary motion of a particle under a constant angular acceleration, angular momentum and concept of moment of inertia in rotational motion, Newton's law of rotational motion, Moment of inertia and its examples, radius of gyration, rotational kinetic energy, relation between Torque and moment of inertia, Theorem of parallel axis, theorem of perpendicular axis.

UNIT III: Elasticity

Elasticity, Effect of temperature and impurities on elasticity of a substance; small deformation, Stress and Strain; Hook's law, elasticity constants for an isotropic solid, Young's modulus, Bulk Modulus, Modulus of rigidity, Poisson's ratio, Relationship between the various elastic moduli. Bending of beam and bending moment, Cantilever, transverse oscillations of a cantilever, torsion of cylinder.

UNIT IV: Oscillations

SHM: Simple Harmonic Oscillations, Differential equation of SHM and its solution. Kinetic energy, Potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor, motion of simple pendulum, motion of compound pendulum, motion of mass connected with spring, motion of torsional pendulum.

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BSPH102: General Properties of Matter

UNIT V: Fluid Mechanics

Ideal and Viscous fluid, Stream line and Turbulent flow, Reynolds's number, Rotational and irrotatinal flow, Equation of continuity, Bernoulli's theorem and its application, Stokes law, viscous flow of fluids, Effect of pressure and temperature on the coefficient of viscosity, Poiseulle's formula, Intermolecular forces-cohesive and adhesive forces, Surface tension, Surface energy, Effect of temperature and impurities on the surface tension, Angle of contact; expression for pressure on a curved surface,

References

1. D. Kleppner and R. Kolenkow, *An Introduction to Mechanics*, 2nd Edition, Cambridge University Press, 2014.
2. D. S. Mathur, *Elements of Properties of Matter*, S. Chand & Co., 1962.
3. C. Kittel, W. D. Knight and M. A. Ruderman, *Mechanics, Berkeley Physics Course*, Vol. 1, 2nd Edition, McGraw-Hill Book Company, 1973.
4. Halliday and Resnick, *Fundamentals of Physics*, 10th Edition, John Wiley & Sons, 2014.
5. H. D. young, R. A. Freedman, R. Bhathal and A. L. ford, *Sears and Zemansky's University Physics with Modern Physics*, 1st Australian SI Edition, Pearson Education Inc, 2011.

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B.Sc. Chemistry/Maths Hons. I Sem

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
BSCHPRP106	DC	Physics Laboratory I	60	20	20	30	20	0	0	2	1

Course Objectives	To work ethically as member as well as leader in a diverse team.
Course Outcomes	Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

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	
T	Tutorial	**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).**
P	Practical	

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BSCHPRP106: Physics Laboratory I

List of Experiments (Any Five)

1. To verify laws of Perpendicular axes for moment of inertia.
2. To determine Acceleration due to gravity using compound pendulum.
3. To determine Coefficient of Viscosity of fluid using Stoke's law.
4. To determine Young's Modulus using Cantilever method.
5. To determine Surface Tension by Jaeger's method.
6. To determine Coefficient of Viscosity of fluid using Poisellie's method.
7. To determine Modulus of rigidity by Torsional pendulum.
8. To determine Young's Modulus of long wire by Searl's method.
9. To determine Poisson's ratio of rubber tube.
10. To determine the force constant of the given spring in parallel combination.

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B.Sc. (Hons)

Choice Based Credit System (CBCS)(Batch 2021-2024)

Semester-I (B.Sc. - Honours)

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*
BSHCH105	Hons	Chemistry - I (Atomic Structure, Bonding, General Organic Chemistry)	4	0	2	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 Basic Chemistry.

To understand and apply the knowledge of Atomic Structure and Bonding.

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. Familiarization with various states of matter. Physical properties of each state of matter and laws related to describe the states.

CO2. Theoretical understanding of structure of atom. Learning scientific theory of. atoms, concept of wave function

CO3. Basic of organic molecules, structure, bonding, reactivity, and reaction mechanisms. Stereochemistry of organic molecules – conformation and configuration, asymmetric molecules, and nomenclature

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

UNIT 1: Inorganic Chemistry-1

Atomic Structure: *Review of: Bohr's theory and its limitations, dual behaviour of matter and radiation, de Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra. Need of a new approach to atomic structure.*

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B.Sc. (Hons)

Choice Based Credit System (CBCS)(Batch 2021-2024)

Semester-I (B.Sc. - Honours)

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*
BSHCH105	Hons	Chemistry - I (Atomic Structure, Bonding, General Organic Chemistry)	4	0	2	5	60	20	20	0	0

What is Quantum mechanics? Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2, quantum numbers, orbital angular momentum and quantum numbers m_l and m_s. Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number (s) and magnetic spin quantum number (m_s).

Rules for filling electrons in various orbitals, electronic configurations of the atoms. Stability of half-filled and filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations.

UNIT 2: Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. polarizing power and polarizability. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

UNIT 3: *Organic Chemistry-I*

Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive Effect, Electrometric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis.

Structure, shape, and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals.

Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Benzenoids and Hückel's rule.

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B.Sc. (Hons)

Choice Based Credit System (CBCS)(Batch 2021-2024)

Semester-1 (B.Sc. - Honours)

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*
BSHCH105	Hons	Chemistry - 1 (Atomic Structure, Bonding, General Organic Chemistry)	4	0	2	5	60	20	20	0	0

UNIT 4:

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and erythro; D and L; *cis - trans* nomenclature; CIP Rules: R/ S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for upto two C=C systems).

UNIT 5: Physical Chemistry-1

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation.

Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases.

Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only).

Liquids

Surface tension and its determination. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only).

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. Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
4. Douglas, B.E. and Mc Daniel, D.H., Concepts & Models of Inorganic Chemistry, Oxford, 1970
5. Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 8th Ed., Oxford University Press (2006).

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

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