



S. S. JAIN SUBODH P.G. COLLEGE
[Affiliated to the University of Rajasthan, Jaipur]

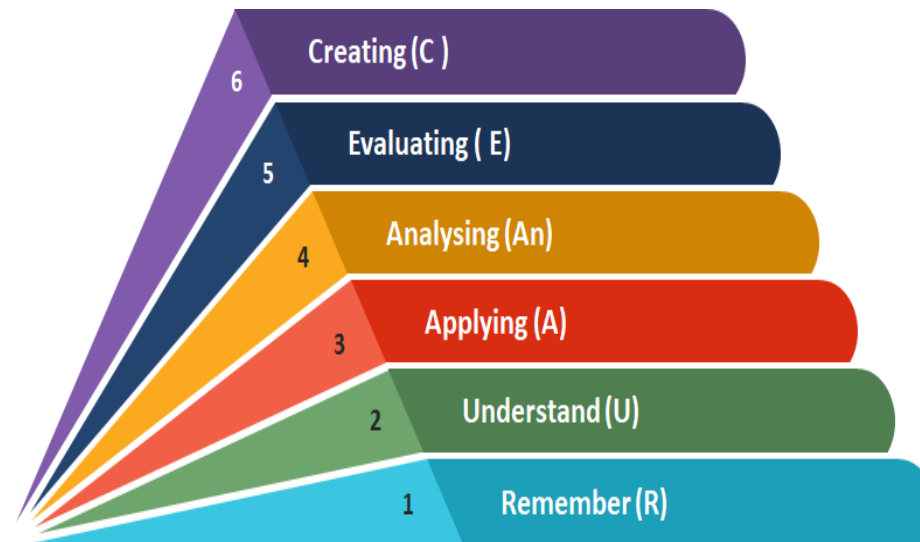
U. G. Honours 2022-23
POs, PSOs, COs

PO's, PSO's, CO's as per Bloom's Taxonomy

Subodh College has adopted a comprehensive framework for educational outcomes, integrating Bloom's Taxonomy to ensure a structured and effective learning experience. Bloom's Taxonomy recently updated, categorizes learning into six levels. These levels guide the design of Programme Outcomes (PO), Programme Specific Outcomes (PSO), and Course Outcomes (CO) to enhance students' cognitive, affective, and psychomotor development.

Learning objectives discussed in the syllabus is observable, specific, and measurable as they are framed according to the recent bloom's taxonomy. The stepwise procedure followed is mentioned as follows:

- Programme outcomes (POs) for UG/PG and UG (Hons.) Courses and other professional courses are discussed.
- Programme specific outcomes (PSOs) are briefly described.
- Course outcomes of offered papers are written by mentioning which particular PSOs it is addressing in learning process.
- Cognitive attributes, on the basis of bloom's taxonomy, are further mentioned. These are **Remember** (recall facts and basic concept), **Understand** (explains idea or concept), **Apply** (use information in new situations), **Analyse** (draw connections among ideas), **Evaluate** (Justify a stand or decision), **Create** (produce new or original work). All are observable, specific, and measurable in terms of cognitive analysis.



Under-Graduation (U.G.)- [Honours] PO, PSO, CO

S. NO.	Under-Graduation Honours Programme
1.	B.Sc. Physics Honours
2.	B.Sc. Chemistry Honours
3.	B.Sc. Botany Honours
4.	B.Sc. Zoology Honours
5.	B.Sc. Math Honours
6.	B.Com. Economic Administration and Financial Management (EAFM) Honours
7.	B.Com. Accountancy and Business Statistics (ABST) Honours
8.	B.Com. Business Administration (BADM) Honours
9.	B.A. Geography Honours
10.	B.A. History Honours

PROGRAMME OUTCOME (PO's) BACHELOR OF SCIENCE (HONS.)

Successful completion of Bachelor of Science programme will make the students proficient in following areas:

1. Students will be able to apply effective oral, written and visual communication skills in theoretical and practical field.
2. Students will be able to collaborate effectively as part of professional teams and in interdisciplinary context.
3. Students will be able to critically analyse sources of information and conduct investigations of complex problems.
4. Students will be able to function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
5. Students will be able to develop skill in experimenting, analysing and interpreting data.
6. Students will be able to inculcate the spirit of originality and novelty in scientific research.
7. Students will be able to recognise the need for and have the preparation and ability to engage in independent and lifelong learning in the multidisciplinary context.
8. Students will be able to develop an understanding of the concept of assessment and its practices.

PHYSICS (HONS.)

Programme Specific Outcome (PSO'S)

PSO1	Developing proficiency in scientific principles & fundamentals.
PSO2	Development of analytical and critical thinking.
PSO3	Development of quantitative & computational skills.
PSO4	Development of problem-solving skills.
PSO5	Exposure to experimental & laboratory skills.
PSO6	Development of interdisciplinary understanding with crossover to Physics, Chemistry & Mathematics.
PSO7	Development of effective communication skills, teamwork & collaborative skills.

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSO addressed	Cognitive levels
I	HSPH 101	Paper I : Mechanics-I	CO1: Understand the concept of inertial and non-inertial frames of reference.	1,2,3,4	R, U, A, An
			CO2: Apply transformations of displacement, velocity, and acceleration between different frames of reference.	4,5	An,E
			CO3: Explain the Galilean transformation and the invariance of Newton's laws.	4,5	An,E
			CO4: Analyze the motion in rotating frames and the effects of pseudo forces such as the Coriolis Force.	4,5	An,E
			CO5: Analyze the motion of a Foucault pendulum and its relation to the rotation of the Earth.	1,2,3,4	R, U, A, An
I	HSPH 102	Paper II : Electromagnetism (I)	CO1: Understand the concept of scalar and vector fields and their physical significance. Demonstrate knowledge of gradient, divergence, and curl operators and their applications in electromagnetism. Apply Gauss divergence and Stokes' theorems to analyze electric and magnetic fields.	1,2,3,4	R, U, A, An
			CO2: Explain the behavior of electric fields and potential energy in different charge distributions. Analyze the interaction of electric dipoles with external electric fields and calculate the resulting potentials. Solve problems related to Poisson's and Laplace's equations in electrostatics.	1,2,3,4	R, U, A, An
			CO3: Describe the behavior of electric fields in different types of matter, including dielectrics and polarized spheres. Understand the concept of electric displacement, susceptibility, and dielectric constant. Understand the concept of vector fields and their mathematical representation. Calculate partial derivatives, gradients, and line integrals of scalar and vector fields.	4,5	An,E
			CO4: Apply Gauss's divergence theorem and understand the physical meaning of divergence in Cartesian coordinates. Relate divergence to the concept of solid angle and Gauss's law. Apply curl to vector fields and understand its physical significance. Use Stokes' theorem to relate curl to line integrals.	4,5	An,E

I	HSPH 103	Paper III - Optics-I	CO1: Understand the concept of interference and diffraction fields, polarization and their physical significance.	1,2,3,4	R, U, A, An
			CO2: Applications of interference, and diffraction in framework of Fraunhofer & Fresnel diffraction phenomenon.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO3: Explain the formation of Newton's rings and determination of wavelength & refractive index.	4,5	An,E
			CO4: Explain the principle of Michelson's interferometer and determination of wavelength & refractive index.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO5: Production and analysis of different type of polarizations and their applications.	4,5	An,E
			CO6: Solve problems related to abovementioned topics.	4,5	An,E
I	HSPH 104	Paper IV - Electrical And Digital Electronics – I	CO1: Understanding of the concept of digital electronics & differences with analog electronics	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of Boolean algebra & De Morgan's theorem.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO3: Understanding of the concept of different number systems.	1,2,3,4	R, U, A, An
			CO4: Understanding of the concept of sum of products (SOP) & products of sum (POS), and interrelation between Minterm & Maxterm.	1,2,3,4	R, U, A, An
			CO5: Understanding of the concept of Karnaugh map, Quine Mc-Clusky algorithms.	1,2,3,4,5,6,7	R, U, A, An, E, C
I	HSPH 151	Physics Practical – I	CO1: Demonstrate proficiency in using various electrical components and instruments required for conducting experiments.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO2: Apply theoretical concepts of electricity and magnetism to design and execute experiments.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO3: Analyse experimental data using appropriate mathematical and statistical techniques.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO4: Interpret experimental results and draw conclusions based on data analysis.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO5: Develop skills in accurately measuring physical quantities and recording. Experimental observations.	1,2,3,4	R, U, A, An
			CO6: Communicate experimental procedures, results, and conclusions effectively in written reports.	1,2,3,4	R, U, A, An

II	HSPH 201	Paper I - Mechanics & Oscillations – II	CO1: Understand the motion under central forces, including gravitational interaction, and apply Kepler's laws, Damped harmonic oscillations.	1,2,3,4	R, U, A, An
			CO2: Driven harmonic oscillators with damping and understand frequency response and power dissipation	3,4,5	A,An,E
			CO3: Coupled oscillators and analyse systems of oscillators with neighbour interactions.	1,2	R,U
			CO4: Analyse mechanical and electrical system undergoing oscillatory motion	1,2	R,U
II	HSPH 202	Paper II - Electromagnetism – II	CO1: Analyze the behavior of magnetic fields in various materials.	1,2,3,4	R, U, A, An
			CO2: Understand electromagnetic waves and their behavior in isotropic and dispersive media.	3,4,5	A,An,E
			CO3: Comprehend magnetic forces.	1,2	R,U
			CO4: Understand magnetic fields in free space and matter.	1,2	R,U
			CO5: Calculate the magnetic field for different current configurations using the Biot:Savart law and deduce the field of any current:carrying wire. Understand transformation relations for electric and magnetic fields between inertial frames. Study electric fields in matter.	1,2	R,U
II	HSPH 203	Paper III - Optics – II	CO1: Understanding of the concept of coherent nature of light, Mono-Chromatism & definition of LASER.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of LASER, stimulated emission, spontaneous emission, Einstein's coefficients, population inversion, optical pumping.	1,2	R,U
			CO3: Methods and production, construction of He-Ne, CO ₂ & Ruby lasers.	3,4,5	A,An,E
			CO4: Understanding of basic principles of holography, construction & reconstruction of image and applications of holography.	1,2	R,U
			CO5: Understanding of concepts of fibre optics, total internal reflection & light propagation.	1,2	R,U

II	HSPH 204	Paper IV - Electrical And Digital Electronics – II	CO1: Understanding of the concepts of semiconductor & transistor characteristics in terms of bipolar and unipolar logic families.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of combinatorial circuits, multiplexers & de-multiplexers.	1,2	R,U
			CO3: Understanding of concept of sequential circuits, flip flops.	1,2	R,U
			CO4: Understanding of concepts of digital counters & applications.	1,2	R,U
II	HSPH 251	Physics Practical – II	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation. They will also enhance their understanding of fundamental concepts and principles in oscillations, damping, coupled oscillators, and material properties.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO2: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios	1,2	R,U
III	HSPH 301	Paper I – Thermo dynamical And Statistical Physics – I	CO1: Understand general interactions in thermodynamics and the first law of thermodynamics, including Helmholtz free energy, Gibb’s free energy, Clausius-Clapeyron equation, vapor-pressure curve, and Zeroth law of thermodynamics.	1,2,3,4	R, U, A, An
			CO2: Study systems in thermal contact with a heat reservoir, canonical distribution, and energy fluctuations.	1,2,3,4	R, U, A, An
			CO3: Calculate the entropy of a system in a heat bath and analyze the Helmholtz free energy. Explore adiabatic interactions, enthalpy, and the first law of thermodynamics.	1,2,3,4	R, U, A, An
			CO4: Learn about the thermodynamic scale as an absolute scale and apply Maxwell relations.	1,2,3,4	R, U, A, An
III	HSPH 302	Paper II - Mathematical Physics & Special Theory of Relativity – I	CO1: Understanding of the various concepts of mathematical physics for applications in physical theories.	1,2,3,4	R, U, A, An
			CO2: Understanding of coordinate transformations, gradient, divergence & curl, Cartesian, circular, cylindrical and spherical polar coordinates, Jacobian.	1,2	R,U
			CO3: Concept of tensor analysis & Dirac delta function	1,2,3,4	R, U, A, An
			CO4: Concept of second order differential equations and special functions.	1,2	R,U

III	HSPH 303	Paper III : Electronics & Solid State Devices – I	CO1: Kirchhoff's first and second laws and their applications in circuits.	1,2,3,4	R, U, A, An
			CO2: Open & short circuits, Hybrid parameters, Network theorems.	1,2	R,U
			CO3: Understanding of the concept of bipolar junction transistor, Load line, Operating point and hybrid parameters for transistors, Transistor as amplifiers	1,2	R,U
			CO4: Understand the frequency response of transistor amplifiers.	1,2	R,U
			CO5: Understanding of the rectifiers & voltage regulation.	1,2	R,U
III	HSPH 304	Paper IV - Physics of Materials–I	CO1: Understand the crystalline & non-crystalline materials.	1,2,3,4	R, U, A, An
			CO2: Understand the polymers, carbon nanotubes, 2D materials.	3,4	A,An
			CO3: Understanding of bonding in materials.	3,4	A,An
			CO4: Understanding of different types of chemical & physical techniques of materials synthesis.	3,4	A,An
			CO5: Understanding of XRD, microwave diffraction, XRF, Raman spectroscopy, SEM, TEM, UV-Visible spectroscopy.	3,4	A,An
III	HSPH 351	Physics Practical – III	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2,3,4	R, U, A, An
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2,3,4	R, U, A, An
IV	HSPH 401	Paper I - Thermodynamical And Statistical Physics – II	CO1: Understand the concept of kinetic theory of gases, energy distribution function & Maxwell's equations.	1,2,3,4	R, U, A, An
			CO2: Experimental verification of Maxwell velocity distribution & principle of equipartition of energy.	3,4	A,An
			CO3: Explain the transport phenomenon of gases, mean free path, distribution of mean paths, viscosity & diffusion.	1,2,3,4	R, U, A, An
			CO4: Explanation of thermodynamics in the framework of statistical approach.	1,2,3,4	R, U, A, An

			CO5: Formulation of classical statistics to form phase space, micro and macro-spaces, thermodynamic probability, monoatomic ideal gas & heat capacity of solids. Understand classical statistics and its validity. Study phase space, microstates, macro states, thermodynamic, probability, and entropy	1,2	R,U
			CO6: Formulation of quantum statistics & explanations.	1,2	R,U
IV	HSPH 402	Paper II - Mathematical Physics & Special Theory of Relativity: II	CO1: Understanding of Lorentz transformation and four vector formulation.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of transformation between lab and centre of mass system.	1,2,3,4	R, U, A, An
			CO3: Understanding of the concept of relativistic electrodynamics.	3,4	A,An
			CO4: Understanding of the concept of boundary value problems.	1,2,3,4	R, U, A, An
IV	HSPH 403	Paper III - Electronics & Solid State Devices-II	CO1: Basic understanding of concept of oscillators, Different types of oscillators of Colpitts and Hartley oscillators, RC oscillators.	1,2,3,4	R, U, A, An
			CO2: Basic understanding of operational amplifiers, characteristics in form of inverting, non-inverting, adder, buffer and difference amplifiers.	1,2	R,U
			CO3: Basic understanding of applications of operational amplifiers in form of integrator, differentiator, multiplier and divider, voltage to current and current to voltage convertor.	1,2,3,4	R, U, A, An
			CO4: Concept of feedback and feedback amplifiers, effect on frequency gain response.	1,2,3,4	R, U, A, An
			CO5: Introduction to field effect transistors (FETs), metal-oxide- semiconductor field effect transistors (MOSFET) and voltage-current responses.	3,4	A,An
			CO6: Learning of digital circuits and related theories.	1,2	R,U

IV	HSPH 404	Paper IV - Physics of Materials – II	CO1: Understanding of the concept of modification of materials.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of defects in materials.	1,2	R,U
			CO3: Understanding of the applications of materials.	1,2,3,4	R, U, A, An
			CO4: Understanding of the energy resources.	1,2,3,4	R, U, A, An
IV	HSPH 451	Physics Practical – IV	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	3,4	A,An
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2	R,U
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2,3,4	R, U, A, An
V	HSPH 501	Paper I - Quantum Mechanics– I	CO1: Development of the basic concept of quantum theory, historical evidences and experimental evidences of quantum theory.	1,2,3,4	R, U, A, An
			CO2: Electromagnetic and blackbody radiations & spectral distribution of energy.	5,6	E,C
			CO3: Limitations of classical theory explaining what it could not explain which quantum mechanics can explain qualitatively.	1,2	R,U
			CO4: Planck’s radiation law & Compton effect.	1,2,3,4	R, U, A, An
			CO5: Matter waves in reference to de Broglie hypothesis.	1,2,3,4	R, U, A, An
			CO6: Davison-Germer experiment to confirm wave nature of electrons which further proved de Broglie hypothesis.	5,6	E,C
			CO7: Schrödinger’s wave mechanics and the uncertainty principle along with its effect.	1,2	R,U

V	HSPH 502	Paper II - Nuclear Physics – I	CO1: Understanding of the various nuclear properties of nuclei nuclear magnetic dipole moment & electric quadruple moment, parity conservation.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of radioactive decays.	1,2	R,U
			CO3: Understanding of the concept of detectors and accelerators.	1,2,3,4	R, U, A, An
			CO4: Basic understanding of the concept of elementary particles.	1,2,3,4	R, U, A, An
V	HSPH503	Paper III - Solid State Physics - I	CO1: Understanding of the concepts of crystal binding and crystal structure.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of thermal properties of solids.	1,2,3,4,5,6	R, U, A, An, E, C
			CO3: Understanding of the concept of band theory of solids.	1,2,3,4,5,6	R, U, A, An, E, C
			CO4: Understanding of the concept of magnetic properties of solids.	1,2,3,4,5,6	R, U, A, An, E, C
V	HSPH 504	Paper IV - Atomic & Molecular Physics - I	CO1: Understanding of the concept of electron angular momentum.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of many electron atoms.	1,2,3,4,5,6	R, U, A, An, E, C
			CO3: Understanding of the concept of molecular spectra & Raman effect.	1,2,3,4,5,6	R, U, A, An, E, C
			CO4: Understanding of the concept of lasers.	1,2,3,4,5,6	R, U, A, An, E, C
V	HSPH 551	Physics Practical – V	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2,3,4,5,6	R, U, A, An, E, C
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2,3,4,5,6	R, U, A, An, E, C

V	HSPH 551	Physics Practical – V	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2	R,U
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2,3,4,5,6	R, U, A, An, E, C
V	HSPH 551	Physics Practical – V	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2,3,4,5,6	R, U, A, An, E, C
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2	R,U
V	HSPH 551	Physics Practical – V	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2,3	R,U,A
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2	R,U
V	HSPH 551	Physics Practical – V	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2	R,U
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2,3,4,5,6,7	R, U, A, An, E, C

VI	HSPH 601	Paper I - Quantum Mechanics– II	CO1: Understanding of the concept of bound state problems.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of applications of quantum theory to atomic spectroscopy.	1,2	R,U
			CO3: Understanding of the concept of molecular spectroscopy.	1,2	R,U
VI	HSPH 602	Paper II - Nuclear Physics - II	CO1: Understanding of the concept of nuclear models.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of nuclear fission.	1,2,3,4	R, U, A, An
			CO3: Understanding of the concept of accelerators.	1,2	R,U
			CO4: Understanding of the concept of fundamental interaction.	1,2	R,U
			CO5: Understanding of the concept of quark model.	1,2,3,4	R, U, A, An
VI	HSPF 603	Paper III - Solid State Physics - II	CO1: Understanding of crystallography and diffraction.	1,2,3,4	R, U, A, An
			CO2: Understanding of the concept of electrical properties of solids.	1,2,3,4	R, U, A, An
			CO3: Understanding of the concept of semiconductors.	1,2	R,U
			CO4: Understanding of the concept of magnetic properties of solids.	1,2	R,U
VI	HSPH 604	Paper IV - Atomic & Molecular Physics - II	CO1: Understanding of basic quantum mechanics in relation to atomic and molecular physical theories.	1,2,3,4	R, U, A, An
			CO2: Understanding of mono: and divalent atomic spectra.	1,2,3,4	R, U, A, An
			CO3: Understanding of Hydrogen fine lines, alkali atom spectrum.	1,2	R,U
			CO4: Understanding of atoms under magnetic field, Zeeman effect both normal & anomalous.	1,2	R,U
			CO5: Understanding of gyromagnetic ratio, L-S & J-J coupling mechanisms.	1,2,3,4	R, U, A, An
			CO6: Understanding of emission & absorption spectroscopies.	1,2,3,4	R, U, A, An
VI	HSPH 651	Physics Practical – VI	CO1: Through these experiments, students will develop practical skills in experimental techniques, data collection, analysis, and interpretation.	1,2,3,4,5,6,7	R, U, A, An, E, C
			CO2: They will also enhance their understanding of fundamental concepts and principles in optics, electronics & thermodynamics.	1,2,3,4	R, U, A, An
			CO3: The lab experiences will foster critical thinking, problem-solving abilities, and the application of theoretical knowledge to real-world scenarios.	1,2	R,U

CHEMISTRY (HONS.) (PSO's)

PSO 1	Upon completion of Bachelor of Science Honours, the students will acquire a comprehensive understanding of the basic principles, concepts, and theories encompassing Organic, Inorganic, Physical, and Analytical Chemistry. Through various laboratory experiments, they will gain practical insights into the application of these principles.
PSO 2	Graduates will demonstrate proficiency in applying analytical skills and problem-solving techniques essential for the practical application of chemical principles in diverse contexts.
PSO 3	Students will develop competence in handling sophisticated instruments and equipment commonly used in chemical laboratories, facilitating their practical application of theoretical knowledge.
PSO 4	By evaluating diverse aspects of Chemistry, students will cultivate a broadened perspective of the subject, enriching their understanding beyond fundamental concepts.
PSO 5	Graduates will adeptly apply appropriate techniques for qualitative and quantitative analysis of chemicals in laboratory settings as well as in industrial contexts, emphasizing the practical relevance of their education.
PSO 6	The program will lay the foundation for research and development in chemistry, empowering students to contribute to advancements and innovations in the field.
PSO 7	Students will develop the ability to evaluate problems independently and draw logical conclusions, fostering critical thinking and analytical reasoning skills.
PSO 8	Graduates will analyze the integral role of chemistry in addressing societal, economic, and environmental challenges, recognizing its significance in driving sustainable solutions.

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSO addressed	Cognitive levels
I	HSCH 101	Inorganic Chemistry-I	CO1: Perceives knowledge of general characteristics of ionic solids, various theories of Metallic bond, semiconductors and insulators, introduction to superconductors superconductivity.	1,6,7	U, R, A
			CO2: Get acquainted with general characteristics of covalent bond, Valence bond theory valence shell electron pair repulsion (VSEPR) theory, dipole moment, percentage ionic character from dipole moment and electronegativity difference.	1,2,3,4	R, U, A, An
			CO3: Learn about molecular orbital theory and able to understand the difference between valence band theory and molecular orbital theory	1,2	R,U
			CO4: Understand about Hydrogen bond, theories of hydrogen bonding Van der Waals forces. Chemistry of noble gases.	1,2	R,U
I	HSCH 102	Organic Chemistry	CO1: Get deep insight of the basic concept of organic reaction mechanism and able to learn about different reactive intermediates	1,4	U,R,A
			CO2: Learn about saturated aliphatic hydrocarbons (alkanes and cycloalkanes), their IUPAC nomenclature, structure, physical and chemical properties.	1,4	U,R,A
			CO3: Commemorate preparation, properties and chemical reactions of Alkenes and Cycloalkenes.	1,7	U,A
			CO4: Understand nomenclature, classification and methods of formations of Dienes and also learn about nomenclature, structure mechanism of chemical reactions of Alkynes.	1,4	U,R
I	HSCH 103	Physical Chemistry	CO1: Learn about the Gaseous state of matter and applications of Gas laws to define properties of Ideal and Real gases.	1,4,6	U, R,,A
			CO2: Comprehend the basics and advanced concepts of Liquid State, Liquid crystals	1,4,6	U,R,A
			CO3: Understand the basics solid state and crystal structure of Solid State.	1,4,6	U,R ,A
			CO4: Interpret rate laws, rate equations of different types of reactions, determine rate constant values, order of reactions, effect of temperature and other factors on reaction rate.	1,4	U,R,A,E

I	HSCH 104	Analytical Chemistry	CO1: Analyse, manage and present data to get the most reliable results in scientific enquiry	1,5,7	U,A,E
			CO2: Evaluate the concentration of analyse by volumetric methods	1,5,7	U,A,E
			CO3: Understand the procedure of gravimetry	1,3,5	U, A
			CO4: Learn about the concepts of solvent extraction	1,3,5	U,R,An
I	HSCH 151	Chemistry Practical's	CO1: Learn about the identification of acidic (cation) and basic (anion) radicals in inorganic mixture experimentally.	1,5	U,A
			CO2: Detect functional group in organic compound.	1,5	U,A
			CO3: Understand the concept of viscosity and surface tension and their determination.	1,3	U,A
II	HSCH 201	Inorganic Chemistry	CO1: Able to understand the periodic variations of different properties of S block elements along the detailed study with alkyls and aryls.	1,4	U,R
			CO2: Get deep insight of periodicity of p: block elements and along with special emphasis on inert pair effect	1,4	U,R
			CO3: Understand study of specific compounds of p block compounds thoroughly.	1,7	U,R
			CO4: Learn about I, II and III series of d block elements along with their spectral properties and stereochemistry.	1,4	U,R
II	HSCH 202	Organic Chemistry	CO1: Get acquainted with stereochemistry of chiral compounds and its relation to presence of stereo-Axis- concept of stereoisomerism and concept of absolute and relative configuration and understand the basic concepts of geometrical isomerism-spatial arrangement of atoms and groups in a molecule and their nomenclature and concept of conformational isomerism.	1,4,7	U,R,A
			CO2: Commemorate nomenclature of benzene derivatives, concept of Aromaticity.	1,4	U,R
			CO3: Learn Electrophilic Substitution reactions and directive influence of various functional groups on arenes.	1,4,7	U,R,A
			CO4: Understand the structure and properties of Alkyl and Aryl halides.	1,4,7	U, R

II	HSCH 203	Physical Chemistry	CO1: Interpret definitions of different thermodynamic processes and assess thermodynamic applications using First law of thermodynamics	1,7	U,A,E
			CO2: Learns about Hess's law and its applications and Kirchhoff's equation.	1,3,7	U,A,,E
			CO3 –Express the concentration of solutions their activity and activity coefficients and get deep insight of colligative properties.	1,4	U,A
			CO4: Understand Colloidal state of matter with in depth study of Sols, Gels and Emulsions	1,4	U,R
II	HSCH 204	Analytical Chemistry	CO1: Learn about the purification of compounds by distillation methods.	1,5	U,A
			CO2: Remember concept of polarimetry	1,5	U,A
			CO3: Evaluate causes and solutions of air pollution.	1,7	U,A,E
			CO4: Analyzes the causes and evaluation methods and prevention of water pollution.	1,7	U,A,E
II	HSCH 251	Chemistry Practical	CO1: Learn about the identification of acidic (cation) and basic (anion) radicals in inorganic mixture along with interfering radicals.	1,5	A,U
			CO2: Analyze organic compound through functional group determination and elemental detection.	1,5	A,U,E
			CO3: Understand the solubility curve of phenol water system.	1,3	U,A
			CO4: Determine heat of reaction and verify hess law.	3,7	U,E
III	HSCH 301	Inorganic Chemistry	CO1: Understand the concept and theories of acids and bases, concept of hardness and softness and pearson's HSAB principle.	1,4	U
			CO2: Learn about the nonaqueous solvents and their general characteristics.	1,5	U, R
			CO3: Get knowledge regarding concept of oxidation and Reduction and representation of Redox potential data by Frost, Latimer and Pourbaix diagrams.	1,7	U,A

III	HSCH 302	Organic Chemistry	CO1: Commemorate classification and nomenclature of Monohydric, dihydric and trihydric alcohols- primary, secondary and tertiary alcohols, Methods of preparation. Hydrogen bonding, acidic nature, reaction of alcohols.	1,4	U ,R A
			CO2: Figure out methods of preparation of phenols, physical properties and acidic character. Comparative acidic strength of alcohols and phenols and name reactions mentioned in syllabus.	1,4	U, R
			CO3: Learn about nomenclature, structure synthesis, physical and chemical properties of aldehydes, ketones and name reactions mentioned in syllabus.	1,4	U,A,E
			CO4: Understand nomenclature structure synthesis, physical and chemical properties of a ethers and epoxides and specific reactions mentioned in syllabus and Organic synthesis via Enolates.	1,4,7	U,A,R
III	HSCH 303	Physical Chemistry	CO1: Understand fundamentals of electrochemistry.	1,2,7	A,U
			CO2: Learn about degree of ionization, Buffer solutions and Solubility and solubility product.	1,2,7	A,U
			CO3: Get deep knowledge about concepts of chemical equilibrium.	1,7	U,A
			CO4: Apply Second Law of Thermodynamics and entropy concepts in analyzing the thermal efficiencies of heat engines such as Carnot cycle, analyze feasibility of chemical reactions and learn about III law of thermodynamics.	1,4	U,A,A
III	HSCH 304	Analytical Chemistry	CO1: Learn the theoretical and practical concepts of Chromatography	1,2,5	UR
			CO2: Understands ion exchange methods and its techniques.	1,2	U, A
			CO3: Applies volumetric estimation of solutions via potentiometric titrations.	1,2	U, A
			CO4: Remembers the principles and applications of conductometric and high frequency titrations.	1,2	U,R, E

III	HSCH 351	Chemistry Practical's	CO1: Understand the quantitative estimation of inorganic compounds through gravimetric methods.	2,5	U, An,E
			CO2: Learn the determination of total hardness of water through complexometric method.	1,5	U,An,E
			CO3: Apply chromatographic techniques to separate components of organic mixture and determine Rf values.	1,2,3	U, An,E
			CO4: Get knowledge about quantitative estimation of organic compounds.	1,2,5	U,A,E
IV	HSCH 401	Inorganic Chemistry	CO1: Understand about coordination compound magnetic properties of transition metal complexes and applications of magnetic moment.	1,4	U,A
			CO2: Learn about VBT and its limitations, able to describe Crystal field theory successfully explain magnetic properties, colour and stability of transition metal complexes.	1,4	U,A,R
			CO3: Elucidate electronic spectra of transition metal complexes along with or gel-energy level diagrams for d1 and d9 states.	1,4,7	U,R
			CO4: Get deep knowledge of thermodynamic and kinetic stability of metal complexes and substitution reactions of square planar complexes.	1,3,7	U,R
IV	HSCH 402	Organic Chemistry	CO1: Interpret the structure of organic compounds through spectroscopic techniques viz. UV and IR	1,3,7	U, A, An
			CO2: Get acquainted with nomenclature, structure, bonding, preparation ,physical and chemical properties of aliphatic carboxylic acids along with relative stability and name reactions mentioned in syllabus	1,4	U,R
			CO3: Comprehend nomenclature and structure of carboxylic acid derivatives and mechanism of esterification and hydrolysis.	1,4	U,A An
			CO4: Learn chemistry of Amine functional group and important name reaction of amines mentioned in syllabus.	1,4	U,R
IV	HSCH 403	Physical Chemistry	CO1: To get deeper insight of Quantum Mechanics.	1,3,7	U,A
			CO2: Learn about adsorption and different adsorption isotherms and understand the difference between thermal and photochemical processes.	1,3	U,A
			CO3 : Understand interaction of electromagnetic radiation with matter as a function of wavelength or frequency	1,3,7	U,A

			CO4: Learn about Vibrational, Raman and Electronic spectrum.	1,3,7	U, An
IV	HSCH 404	Analytical Chemistry	CO1: Get deep insight of basic principles, techniques of spectrophotometry.	1,3,7	An, U
			CO2: Learn the significance of thermal analytical techniques.	1,2	U, An
			CO3: Select appropriate methods for sample treatment in A. A.S.	1,3,6	U, A, A n
			CO4: Understand qualitative and quantitative analysis using A.E.S.	1,5	U, An
IV	HSCH 451	Chemistry Practical	CO1: Learn to synthesize various coordination compounds in laboratory.	1,3	U, A
			CO2: Get acquainted with experiments to synthesize various organic compounds.	1,3	U,A
			CO3: Demonstrates the concepts of thermochemistry in determining enthalpy of neutralization, ionization and solution.	1,5	U,An,E
			CO4: Determine the strength of strong and weak acid conductometrically.	1,5	U,An,E
V	HSCH 501	Inorganic Chemistry	CO1: Learn about classification, preparation, Structure and applications of Silicones and Phosphazenes and structure and functioning of metalloporphyrin.	1,4,9	U,A
			CO2: Get deep insight of metal clusters and preparation, properties and transition metal carbonyls.	1,4	U,R, A
			CO3: Able to know about the synthesis, properties and structures of organometallic compounds.	1,4	U,R,A
			CO4: Understand limitations of CFT and thorough concept of MOT.	1,4,7	U,R,A
V	HSCH 502	Organic Chemistry	CO1: Interpret spectra of basic organic compounds and can design synthetic routes for drugs by NMR spectroscopy.	1,6,7	U,A
			CO2: Learn about nomenclature and classification of organometallic compounds.	1,4	U,An
			CO3: Understand Molecular orbital diagram and Aromatic characteristic of heterocyclic compound (Pyrrole, Furan, Thiophene and Pyridine), their methods of synthesis and chemical reactions and learn about condensed five and six membered heterocycles.	1,4	U,A,An
			CO4: Apprehend mechanisms of polymerization and wide applications of polymers in day to day life.	1,4	U,A

V	HSCH 503	Physical Chemistry	CO1: Understand Schrodinger's wave equation for particle in three dimensional boxes, M.O. Theory and Introduction to Valence bond model.	1,7	U,A
			CO2: Get acquainted with systems of variable composition.	1,4,6	U,A
			CO3: Apply their knowledge to determine molecular structure by studying physical properties of different compounds.	1,7	U,A,E
			CO4: Gain knowledge about different types of electrodes, Electrode reactions, Nernst equation and thermodynamic quantities of cell reactions.	1,3	U,A
V	HSCH 504	Analytical Chemistry	CO1: Describe the principle and instrumentation of electro gravimetry and its applications	1,3	U,A
			CO2: evaluate polarographic methods	1,7	U,E
			CO3: Understand samperometry and voltametric methods.	1,2	U, An
			CO4: Analyse mass spectra of various functional groups.	1,7	U, An
V	HSCH 551	Chemistry Practical	CO1: Analyse inorganic mixture containing six radicals containing one rare ion.	1,5	U, An, E
			CO2: Go through quantitative estimation of inorganic mixture by volumetric and gravimetric methods.	1,5	U, A
			CO3: Develop skill of separate and analyse of binary solid organic mixture.	1,2	U, A,E
			CO4: Determine the strength of acids pH metrically.	1,5	U,A,E
VI	HSCH 601	Inorganic Chemistry	CO1: Learn fundamentals of nuclear chemistry and qualitative idea of stability of nucleus.	1,4	U,A
			CO2: Gain knowledge about natural and artificial radioactivity, nuclear reactions, nuclear reactors and hazards of radioactive emanations.	1,4	U, R
			CO3: Understand role of bulk and trace metal ions in biological systems and metalloporphyrin.	1,8,9	U, A
			CO4: Get detailed idea of nitrogen fixation and metalloenzymes.	1,8,9	U,A

VI	HSCH 602	Organic Chemistry	CO1: Understand about introduction, instrumentation, factors influencing fragmentation, ion analysis, ion abundance. fragmentation modes, mass spectral fragmentation of simple organic compounds	1,3,6,7	U,A
			CO2: Go through classification and nomenclature of carbohydrates, distinguish between monosaccharides and disaccharides.	1,4,9	U,A,R
			CO3: Get knowledge about Nucleic acids and Vitamins, Structure of DNA and RNA, biological importance of different vitamins	1,4,6,9	U,A
			CO4: Learn about Synthetic dyes their colour, constitution and classification.	1,7	U,A,An
VI	HSCH 603	Physical Chemistry	CO1: Comprehend structure of double layer, Potentiometric titrations. Introduction of polarographic technique. Classification of electrochemical cells.	1,6,7	U,A
			CO2: Learn about macromolecules, molecular weight determination methods of polymers and enzyme catalysis,	1,4,9	U,A,R
			CO3: Get deep insight about phase equilibrium with reference to one and two component systems.	1,7	U,A,An
			CO4: Know about surface phenomena, adsorption	1,4	U,A
VI	HSCH 604	Analytical Chemistry	CO1: Learn about condensed five and six membered heterocycles.	1,4	U,R
			CO2: Implement knowledge to investigate building blocks of life, enzymes and hormones	1,4,9	U,A
			CO3: Apply concept of phase rule in industries viz. purification of components, food production and alloy industries.	1,5	U,A,An
			CO4: Deep insight of colligative properties.	1,4	U,A
VI	HSCH 651	Chemistry Practical's	CO1: Learn about the preparation of various coordination compounds.	1,5	U,An
			CO2: Understand two step preparation of organic compounds.	1,7	U,A
			CO3: Get acquainted with potentiometric titrations.	1,2,3	U,A,E
			CO4: Know how to verify Lambert Beer's law and determine the concentration of unknown solution.	1,2	U,An,E

BOTANY (HONS.) (PSO's)

S. No.	On completing Bachelor of Science (Botany), the student will be able to:
PSO1	Understand Microbes (Viruses and Bacteria) and the relevance of Microbes and Plants to the environment (ecological significance) and human well-being (economic importance)
PSO2	Develop an understanding of the Evolution of Plant forms and the consequent Biodiversity. These are instrumental increasing awareness of the threats to biodiversity and sensitizing students toward the Conservation of Biodiversity for sustainable development
PSO3	To study the organization of cells, cell organelles, and biomolecules (i.e. Protein, carbohydrate, lipid, and nucleic acid). Students will gain knowledge of the activities in which the diverse macro molecules and microscopic structures inhabiting the cellular world of life are engaged. This will facilitate the students to understand the various metabolic processes such as respiration, photosynthesis, etc. which are important for life.
PSO4	Understand new knowledge and widen the knowledge acquired by handling classical and modern plant biotechnology processes, including tissue culture for healthy plants, and plants with improved characteristics.
PSO5	To explore the natural genetic variation in plants and to understand how diverse factors (a the cellular level) contribute to the expression of genotypes and hence to phenotypic variation and will understand the application of conventional breeding approaches and gene technology approaches in plant breeding programs.
PSO6	Understand biotechnological process such as recombinant DNA technology and its applicative value in pharmaceuticals (vaccines, antibodies, antibiotics, etc.), the food industry (transgenic crops with improved qualities (nutraceuticals, industrial enzymes, etc.), agriculture (biotic and abiotic stress tolerant plants, disease and pest resistant plants, improved horticultural varieties, etc.), ecology (plants role in bioremediation).
PSO7	Understand plant classification systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics and molecular biology of various plant groups. Students will gain expertise in the fields of seed science & technology, seed health, and seed storage.
PSO8	Understand various analytical techniques of plant sciences, the use of plants as industrial resources or as human livelihood support systems, and the use of transgenic technologies for basic and applied research in plants, understand the basic concepts of Bioinformatics and Biostatistics, Understand the scientific application of nano materials and nano technology in agriculture, health, and environmental conservation.

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSOs addressed	Cognitive levels
I	HSBO 101	Cytology	CO1: Students will develop a comprehensive understanding of the structure of cells, including their organization and the processes involved in cell division.	3	U,R
			CO2: Graduates will be proficient in comprehending the structure and functions of essential cellular components such as the cell wall, plasma membrane, and various organelles, elucidating their roles in cellular physiology	3	U,R
			CO3: Through the exploration of DNA structure and the functions of the nucleus, students will gain insight into the molecular basis of genetic information storage, replication, and gene expression within the cell.	3	U,R
			CO4: Students will acquire knowledge of the eukaryotic cell cycle and the mechanisms governing mitotic and meiotic cell divisions, providing a foundation for understanding growth, development, and reproduction in multicellular organisms.	3	U,R
I	HSBO 102	Algae and Lichens	CO1: Students will gain an understanding of the diversity among algae, encompassing their classification, ecological roles, and adaptations to various environments.	2	U,R
			CO2: Graduates will demonstrate proficiency in recognizing and describing the systematic classification, morphology, and structural characteristics of algae, enabling them to identify different taxa and appreciate their ecological significance.	2	U,R
			CO3: Through the study of algae life cycles, students will comprehend the reproductive strategies, alternation of generations, and ecological significance of various life cycle patterns exhibited by algae species.	2	U,R
			CO4: Students will acquire knowledge about the distinct classes of lichens, including their morphological features, ecological niches, and utilization in various fields such as ecology, medicine, and industry. They will understand the importance of lichens in environmental monitoring, as bio indicators, and in providing resources for pharmaceuticals, cosmetics, and ecological restoration efforts.	2	U,R

I	HSBO 103	Plant Physiology I	CO1: Students will acquire basic knowledge of plant physiology, including the fundamental processes governing the growth, development, and functioning of plants.	3	U,R
			CO2: Graduates will demonstrate understanding of the structure and properties of water, osmosis, and the mechanisms involved in active and passive transport across cellular membranes.	3	U,R
			CO3: Through detailed study, students will comprehend the process of photosynthesis in higher plants, focusing on the light and dark reactions, C3 and C4 pathways, and gain insight into respiration in higher plants, with emphasis on aerobic and anaerobic respiration.	3	U,R
			CO4: Students will understand the process of respiration in bacteria and higher plants, including the biochemical pathways involved and the significance of respiration in energy production and metabolic processes within these organisms.	3	U,R
I	HSBO 104	Ecology	CO1: Students will have the opportunity to acquire a comprehensive understanding of fundamental ecology concepts, including the interactions between organisms and their environment, population dynamics, and ecosystem structure and function.	2,7	U,R
			CO2: Graduates will be educated on the abiotic and biotic elements that impact the structure of ecosystems, facilitating their comprehension of basic ecological principles such as energy flow, nutrient cycling, and community dynamics.	2,7	U,R
			CO3: Through their studies, students will acquire knowledge about the diverse ways in which organisms engage with both the physical and biological surroundings, including adaptation, competition, predation, and symbiosis.	2,7	U,R
			CO4: Students will gain insight into the distinctions in the composition and operation of various ecosystems, including terrestrial, aquatic, and transitional ecosystems, and understand how factors such as climate, geography, and human activities influence ecosystem dynamics.	2,7	U,R

I	HSBO 151	Practical	CO1: They will learn about the plant cell and cell organelles.	2,3	U,R
			CO2: They will learn to know the range of thallus structure and Morphological study of available plant material of Algae, and lichens.	2,3	U,R
			CO3: Students will learn to do practical work related to plant physiology.	4,5	An,E
			CO4: They will be able to observe the division of cells with the help of practical work.	4,5	An,E
II	HSBO 201	Genetics and Plant Breeding	CO1: Students will gain basic knowledge of genetics and plant breeding, including the principles of inheritance, genetic variation, and breeding methodologies.	5	U,R
			CO2: Graduates will be proficient in quantifying heritable traits, providing insights into the cellular and molecular mechanisms underlying genetic inheritance and variation.	5	U,R
			CO3: Through their studies, students will understand the building blocks of a breeding program, including the selection criteria, breeding methods, and techniques for developing cultivars resilient to biotic and abiotic stresses.	5	U,R
			CO4: Students will acquire a comprehensive understanding of the chemical basis of heredity, including DNA structure, replication, and gene expression. They will also gain the necessary knowledge for planning, implementing, and analyzing genetic experiments to improve crop traits and breeding outcomes.	5	U,R
II	HSBO 202	Mycology	CO1: Students will acknowledge the biodiversity of fungi	2	U,R
			CO2: Graduates will possess knowledge of the systematic classification	2	U,R
			CO3: Through the study of fungal life cycles	2	U,R
			CO4: Students will understand the economic significance of fungi	2	U,R

II	HSBO 203	Plant Physiology–II and Biochemistry	CO1: Students will gain an understanding of the importance and scope of plant physiology, recognizing its significance in elucidating the mechanisms underlying plant growth, development, and responses to environmental stimuli.	3	U,R, A
			CO2: Graduates will appreciate the importance of seed germination and dormancy in plant propagation, and they will understand the phases of plant growth, from seedling establishment to maturity, and the factors influencing each stage.	3	U,R, A
			CO3: Through their studies, students will develop an understanding of the growth and developmental processes in plants, including cell division, elongation, differentiation, and organogenesis, and how these processes are regulated by internal and external factors.	3	U,R
			CO4: Students will comprehend the concept and significance of proteins, enzymes, carbohydrates, and lipids in plant metabolism and physiology. They will recognize the roles of these biomolecules in energy storage, structural support, signaling, and enzymatic catalysis within plant cells.	3	U,R
II	HSBO 204	Bryophyta	CO1: Students will develop an understanding of the morphological diversity exhibited by Bryophytes, including their various forms and structures such as gametophytes, sporophytes, and reproductive organs.	2	U,R
			CO2: Graduates will be knowledgeable about the taxonomic position of Bryophytes in the plant kingdom, their occurrence in different habitats, thallus structure, and modes of reproduction, enabling them to identify and classify Bryophyte species.	2	U,R
			CO3: Through their studies, students will comprehend the economic importance of Bryophytes, including their roles in ecosystems, as indicators of environmental health, and their uses in horticulture, landscaping, and soil stabilization.	2	U,R
			CO4: Students will understand the useful and harmful activities associated with Bryophytes, including their contributions to nutrient cycling, soil formation, and water retention, as well as their potential as invasive species in certain ecosystems.	2	U,R

II	HSBO 251	Practical	CO1: They will learn about the plant cell and cell organelles.	2,3,5	U,R
			CO2: They will learn to know the range of thallus structure and Morphological study of available plant material of Algae, and lichens.	4,5	An,E
			CO3: Students will learn to do practical work related to plant physiology.	4,5	An,E
			CO4: They will be able to observe the division of cells with the help of practical work.	4,5	An,E
III	HSBO 301	Molecular Biology	CO1: Know the scope and importance of molecular biology. They understand the structure of DNA, the Packing of DNA and types of DNA, RNA.	6, 7	U,R
			CO2: Understand the DNA replication and various enzymes involved in that process.	6, 7	U,R
			CO3: Know the transcription in prokaryotes and eukaryotes and transcriptional factors.	6, 7	U,R
			CO4: Understand the process of translation, Genetic code, Translational factors and their inhibitors, concept of Operon, and regulation of gene expression.	6, 7	U,R
III	HSBO 302	Pteridophyta	CO1: Students will develop an understanding of the morphological diversity exhibited by Pteridophytes, including their various forms, structures, and adaptations to terrestrial environments.	2	U,R
			CO2: Graduates will acquire knowledge about the morphology, anatomy, and life cycle patterns of Pteridophytes, including their reproductive strategies such as spore production and dispersal.	2	U,R
			CO3: Through their studies, students will comprehend the economic importance of Pteridophytes, including their roles in horticulture, landscaping, and medicine. They will also explore the evolutionary history and adaptations of Pteridophytes from ancient to modern times.	2	U,R
			CO4: Students will understand the diversity of fossil genera representing different fossil groups within the Pteridophytes. They will explore the fossil record to understand the evolutionary relationships and ecological roles of extinct Pteridophytes species.	2	U,R

III	HSBO 303	Morphology of Angiosperms	CO1: Students will gain a comprehensive understanding of plant development, including the processes of growth, differentiation, and morphogenesis from embryogenesis to senescence.	7	U,R
			CO2: Graduates will understand the habits of the angiosperm plant body, including their growth forms, branching patterns, and reproductive strategies, and they will be able to identify and describe the vegetative characteristics of different plant species.	7	U,R
			CO3: Through their studies, students will realize the origin of angiosperms in terms of geological time, geographical location, and their probable ancestors. They will explore the evolutionary history and adaptive radiation of angiosperms, leading to their dominance in terrestrial ecosystems.	7	U,R
			CO4: Students will comprehend various angiosperm families, emphasizing their morphology, distinctive features, and biology. They will be able to classify and identify different angiosperm taxa based on floral structures, leaf arrangements, and reproductive strategies, enriching their understanding of plant diversity and evolutionary relationships.	7	U,R
III	BOT(H): 304	Microbiology	CO1: Students will describe the diversity of microorganisms, including bacteria, and understand their cell structure and function. They will comprehend bacterial microbial genetics, including mechanisms of recombination and gene transfer, contributing to their understanding of microbial evolution and adaptation.	1	U,R
			CO2: Graduates will understand microbial growth and metabolism, including the factors influencing microbial growth and the pathways involved in nutrient utilization and energy production. They will also learn about the methods to control microbial growth using physical and chemical means, contributing to their knowledge of microbiological control strategies.	1	U,R

			CO3: Through their studies, students will acquire knowledge of the cultivation methods of bacteria, yeast, fungi, and viruses, including techniques for isolation, culture, and maintenance of microbial cultures. They will understand the principles and practices of microbial cultivation, enabling them to work effectively in microbiological laboratories.	1	U,R, A
			CO4: Students will learn the principles, working mechanisms, and applications of instruments such as pH meters, spectrophotometers, centrifuges, and laminar airflow cabinets in microbiology laboratories. They will develop proficiency in using these instruments for various analytical and experimental purposes, enhancing their skills in microbiological research and analysis.	1	U,R, A
III	HSBO 351	Practical	CO1: Students should understand Skill in practical work, experiments, use of biological tool and techniques and handling instruments for analysis of result.	1,2,6,7	U,R ,A
			CO2: Anatomical and life cycle studies, Vascular tissues and its constituents studies by sections and maceration, wood anatomy, TS, TLS, and RLS of available plant material of Gymnosperms.	6, 7	U,R
			CO3: Students will learn about the primary and secondary, normal and anomalous structures of Monocot and Dicot Roots and Stems in Angiosperms.	6, 7	U,R
			CO4: Students will learn about plant diseases caused by Viruses, Bacteria and Fungi.	6, 7	U,R
IV	HSBO 401	Bio techniques and Biostatistics	CO1: Recognize the definition of statistics, its subject, and its relation with the other sciences.	8	U,R, A
			CO2: Restate the principal concepts of biostatistics and identify data relating to variable/variables.	8	U,R, A
			CO3: To understand the core concepts of bio techniques.	8	U,R
			CO4: To understand computational biology.	8	U,R

IV	HSBO 402	Gymnosperms and Pale botany	CO1: Understand the morphological diversity of gymnosperms.	2	U,R
			CO2: Know them orphology, anatomy life cycle pattern of gymnosperms.	2	U,R
			CO3: Understand the economic importance of the gymnosperms.	2	U,R
			CO4: Understand the various fossil genre are present in different fossil groups.	2	U,R
IV	HSBO 403	Anatomy of Angiosperms	CO1: Understand the scope & importance of Anatomy.	7	U,R
			CO2: Students will be able to understand plant development	7	U,R
			CO3: Understand the scope & importance of Anatomy and know various tissue systems.	7	U,R
			CO4: Students will be able to understand internal structure	7	U,R
IV	HSBO 404	Plant Pathology	CO1: Students will earn about plant diseases caused by Fungi.	2	U,R
			CO2: Recognize the significance plant pathology.	2	U,R
			CO3: Understand how to avoid and control plant diseases as well as how they affect crop productivity.	2	U,R
			CO4: Understand the scope and importance of Plant Pathology.	2	U,R
IV	HSBO 451	Practical	CO1: Students should understand Skill in practical work, experiments, use of biological tool and techniques and handling instruments for analysis of result.	2,7,8	U,R
			CO2: Anatomical and life cycle studies, Vascular tissues and its constituents studies by sections and maceration, wood anatomy, TS, TLS, and RLS of available plant material of Gymnosperms.	6, 7	U,R
			CO3: Students will learn about the primary and secondary, normal and anomalous structures of Monocot and Dicot Roots and Stems in Angiosperms.	6, 7	U,R
			CO4: Students will learn about plant diseases caused by Viruses, Bacteria and Fungi.	6, 7	U,R

V	HSBO 501	Plant Biotechnology	CO1: Understand the basic concepts of Biotechnology and techniques of sterilization.	4, 6, 8	U,R, A
			CO2: Know various methods of Tissue culture, various types of cultures, protoplasm isolation, fusion techniques, and their applications.	4, 6, 8	U,R, A
			CO3: Understand the techniques used in recombinant DNA technology and gene transfer Genomic and DNA library Application of transgenic plants.	4, 6, 8	U,R, A
			CO4: To understand the concepts of medical Biotechnology, Disease diagnosis, Endogenous therapeutics, gene therapy, and stem cells. Knowledge of Industrial Biotechnology for Large-scale productions.	4, 6, 8	U,R, A
V	HSBO 502	Systematics of Angiosperms	CO1: Understand the Phylogeny of Angiosperms and Understand the general range of variations in the group of angiosperms.	7	U,R, A
			CO2: Learn about the characters of biologically important families of angiosperms.	7	U,R
			CO3: Understand various rules, principles, and recommendations of plant nomenclature produced in plant identification.	7	U,R
			CO4: To learn recent knowledge about the different tools in the taxonomy to relocate the phylogenetic position of plant or taxa.	7	U,R, A
V	HSBO503	Economic Botany	CO1: Understand the Centre of origin of cultivated plants	2	U,R
			CO2: To know the history, origin, distribution, botany, cultivation, and processing of cereals and pulses.	2	U,R
			CO3: Learn about the General account and identification of spices and condiments, dyes, beverages, fumigatory, and masticatories.	2	U,R, A
			CO4: To know about the General account and identification of locally available fruits, vegetables, ornamental, timber-yielding, and medicinal plants.	2	U,R, A

V	HSBO504	Embryology of Angiosperms	CO1: Understand the structure and development of microsporangium and megasporangium.	7	U,R, A
			CO2: Understand microspore genesis and megaspore genesis and male and female gametophytes.	7	U,R, A
			CO3: Understand the dynamic mechanism of plant pollination and development.	7	U,R, A
			CO4: Know fertilization, endosperm, and embryogenesis in angiosperms.	7	U,R, A
V	HSBO551	Practical	CO1: Students will learn about the practical work related to media preparation and sterilization techniques.	2,4,6,7,8	U,R,A
			CO2: Study of the families with respect to morphological characters using botanical terms, floral formula, floral diagram and classification giving identification of genus and species with the help of plant materials.	1,2	R,U
			CO3: Students gain knowledge about plants utility, test different content in living plant materials.	1,2	R,U
			CO4: Gain knowledge about reproduction process in living plant material (Androecium and Gynoecium), Endosperm and types of embryo.	1,2	R,U
VI	HSBO601	Genetic Engineering	CO1: Define the basic concepts of genetic engineering as a Biotechnology tool.	6	U,R
			CO2: Know the natural function of restriction endonucleases and how a normal bacterial cell protects its DNA from their activity.	6	U,R
			CO3: Understand the industrial production of important microbial metabolites and products.	6	U,R
			CO4: Gain knowledge of isolation, maintenance, and handling of industrially important microbial cultures in laboratory settings.	6	U,R
VI	HSBO602	Ethno botany	CO1: Know the interactions of people and plants.	1, 2	U,R
			CO2: Acquire an understanding of the importance of plants in our daily lives.	1, 2	U,R
			CO3: Identify local ethno botanically useful species.	1, 2	U,R
			CO4: Cultural uses of plants globally and locally	1, 2	U,R

VI	HSBO603	Biodiversity Conservation	CO1: Understanding the basics of the science of biodiversity in an ecological context.	6,7	U,R
			CO2: Learning tools and techniques, relevant to monitoring of biological diversity.	6,7	U,R
			CO3: Ability to design a field-based project with rationale and appropriate methodology	6,7	U,R
			CO4: To understand the role of plants concerning Human Welfare.	6,7	U,R, A
VI	HSBO604	Seed Science	CO1: To believe the role of good quality seed in agriculture.	7	U,R, A
			CO2: To impart knowledge about various tools involved in hybrid seed production of crop plants.	7	U,R, A
			CO3: Students will be able to know the seed production technology of different vegetable crops.	7	U,R, A
			CO4: To understand the factors influencing seed production.	7	U,R, A
VI	HSBO651	Practical	CO1: Practical related to genetic engineering provide knowledge about genetic basis of transcription and translation, Anther culture, ovary culture etc.	1,2,6,7	U,R,A
			CO2: Practical help in understanding the importance of plants and their medicinal value in our daily lives.	1,2	R,U
			CO3: Practical gain knowledge about global, national and international status of Biodiversity, evaluate biodiversity index and strategies to conserve in situ and ex situ.	1,2	R,U
			CO4: Students gain knowledge about seed testing, seed certification and technique of new variety seed production through practical's.	1,2	R,U

ZOOLOGY (HONS.) (PSO's)

PSO1	Demonstrate a fundamental understanding of the academic field of Zoology, its different learning areas and applications, and its link with related disciplinary areas/subjects; provides awareness on the divisions in Animal Kingdom, their distribution, relationship among them and with the environment.
PSO2	Show Procedural knowledge in various professions related to the subject in different fields inclusive of research and development, teaching, government and public services with the help of practical tests in different branches; Use it to analyses complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
PSO3	Exhibit Skills in areas related to their individual specialization like genetic engineering, in relation to current developments and related fields in the domain; helps to apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
PSO4	Able to communicate the concepts, constructs and techniques involved in with ease and in a clear manner based on the animal evolution, animal behavior, animal development and animal ecology topics.
PSO5	Techniques and Methodologies discussed in the vital topics like Cell Biology, Genetics, and Molecular Biology manifest the knowledge in research specific areas and studies by correlating the physiological processes of animals and relationship with cellular structure.
PSO6	Understand the environmental conservation processes and its importance, pollution control, protection of endangered species, Wildlife Management; Climatic changes and Global Management are discussed as a paper to improvise the subject knowledge for identifying any problems related and in helping the impacted environment and biodiversity.
PSO7	Helps advancement in job, trades, and employment with the help of knowledge about of Agro-based Small Scale industries like sericulture, fish farming, butterfly farming and vermicomposting preparation and helps create various opportunities in the educational, research and developmental, social entrepreneurial sectors related to the same.
PSO8	Should be able to create a contextual contents and examples in the real time world based on the applications and discussions carried out in all the subjects like combining clinical laboratory techniques studied as part of Medical Parasitology and behaviors of the microbes studied as part of the Microbiology.
PSO9	Improve the observational, computational, and analytical ethical skills required for the research and development fields discussed for evolving trends in Genetics, molecular biology, microbiology, cell biology, etc.

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSOs addressed	Cognitive levels
I	HSZ0101	Diversity of Animals–I (Lower Invertebrates)	CO1: Understand the general taxonomic rules on animal classification, the principles and methods of taxonomy and the general characters of phylum Protozoa and understand the protozoan's parasites of human.	2, 3	U,R
			CO2: Classify the phylum Porifera & Coelenterata using examples, Understand the canal system of sponges and Polymorphism in Coelenterates.	2, 3	U,R
			CO3: Phylum helminthes& Annelida with taxonomic keys, and a basic idea of metameric in Annelids and parasitic adaptations of helminthes.	2, 3	U,R
			CO4: Understand the classification and characteristics of Phylum Arthropod, mouth parts of insects, the classification and characteristics and economic importance of Phylum Mollusca's.	2, 3	U,R
			CO5: Classification and characteristics of Phylum Echinodermata & structures and water vascular system and larval forms of echinoderms.	2, 3	U,R
I	HSZ0 102	CELL BIOLOGY	CO1: Gain knowledge on cell structure and its functions	3	U,R
			CO2: Analyses the functional role of various cellular organelles in the cell.	2,7	U, R
			CO3: Learn the integrated molecular events.	1,2	R,U
			CO4: Hypothesize Chromosomes Structure and functions	1,2	R,U
			CO5: Understand the mechanisms of cell division and control of Cancer mechanisms.	1,2	R,U
I	HSZ0 103	Developmental Biology	CO1: Understand reproductive organs, gametogenesis and fertilization	3	U,R
			CO2: Illustrate cleavage, blastula ion and gastrulation	1,2,3	R,U,A
			CO3: Understanding the phenomenon of organogenesis	1,2,3	R,U,A
			CO4: Understanding nuclear transplantation methods in frog	1,2,3	R,U,A
			CO5: Gain knowledge in test tube baby and in vitro fertilization	1,2,3	R,U,A

I	HSZ0104	Principles of Ecology	CO1: Understand the different factors of ecosystem and be able to explain the structure and impact of biogeochemical cycles	3	U,R
			CO2: Gain knowledge about fresh water habitat	2,1	U,R
			CO3: To analyze the characters of community ecology	1,2,3	R,U,A
			CO4: Classify the various ecosystems and animal interactions	2,1	U,R
			CO5: Gain knowledge in controlling various types of pollution	1,2,3	R,U,A
I	HSZ0 151	Zoology Practical-I	CO1: Identify and classify lower invertebrate specimens using morphological characteristics and taxonomic keys.	5,2,3,4	U,R, A, An
			CO2: Prepare and observe histological sections of lower invertebrate tissues under the microscope, identifying different cell types and structures.	2,1	U,R
			CO3: Conduct experiments to investigate cellular processes such as mitosis, meiosis, and cellular respiration in lower invertebrates.	1,2,3	R,U,A
			CO4: Perform developmental biology techniques, including embryonic staging, manipulation, and observation, to study the life cycles of lower invertebrate species.	2,1	U,R
			CO5: Apply ecological sampling methods to assess the abundance, diversity, and distribution of lower invertebrates in different habitats.	1,2,3	R,U,A
II	HSZ0 201	Diversity of Animals-II (Higher Invertebrates)	CO1: Describe general taxonomic rules on animal classification	2,1	U,R
			CO2: To understand the life history of phylum porifera to annelid. Understanding the parasites of human concern	1,2,3	R,U,A
			CO3: To understand the development of some invertebrates and the economic importance of insects	2	U,R
			CO4: To understand the life history and different respiratory systems	5,2,3,4	U,R, A, An
			CO5: Understand the different physiological systems of various higher animals	5,2,3,4	U,R, A, An

II	HSZO 202	Molecular Biology	CO1: Explain the structure and function of nucleic acids (DNA and RNA) and their role in the central dogma of molecular biology.	3	U,R
			CO2: Describe the molecular mechanisms of DNA replication, repair, and recombination.	2,1	U,R
			CO3: Discuss the principles of protein synthesis (translation) and the genetic code.	1,2,3	R,U,A
			CO4: Illustrate the regulation of gene expression in prokaryotes and eukaryotes.	2,1	U,R
			CO5: Apply techniques of molecular cloning, including the use of vectors, restriction enzymes, and PCR.	1,2,3	R,U,A
II	HSZO 203	Principles of Genetics	CO1: Explain the fundamental concepts of Mendelian genetics, including laws of inheritance, segregation, and independent assortment.	3	U,R
			CO2: Describe the structure, function, and replication of genetic material (DNA and RNA).	2,1	U,R
			CO3: Discuss the molecular basis of gene expression and regulation, including transcription, translation, and epigenetics.	1,2,3	R,U,A
			CO4: Analyze genetic linkage, mapping, and the role of recombination in genetic diversity.	3	U,R
			CO5: Apply principles of population genetics to understand the distribution and behavior of genes in populations over time.	2,1	U,R
II	HSZO 204	Evolutionary Biology	CO1: Explain the fundamental principles of evolution, including natural selection, genetic drift, mutation, and gene flow.	3	U,R
			CO2: Describe the processes and patterns of speciation and the mechanisms that drive it.	2,1	U,R
			CO3: Analyze the fossil record and molecular data to interpret the evolutionary history of life on Earth.	1,2,3	R,U,A
			CO4: Discuss the role of adaptation in shaping the diversity and complexity of organisms.	3	U,R
			CO5: Evaluate contemporary issues in evolutionary biology, such as antibiotic resistance, climate change impacts, and conservation genetics.	2,1	U,R

II	HSZO 251	Zoology Practical-II	CO1: Demonstrate proficiency in the use of laboratory techniques for analyzing genetic variation and evolutionary relationships among species.	5,2,3,4	U,R, A, An
			CO2: Conduct experiments and field studies to observe and record patterns of natural selection and adaptation in different organisms.	3	U,R
			CO3: Analyze fossil specimens and molecular data to reconstruct phylogenetic trees and interpret evolutionary histories.	2,1	U,R
			CO4: Investigate and document evidence of speciation events through comparative anatomy and genetic analysis	5,2,3,4	U,R, A, An
			CO5: Evaluate the impact of environmental changes on evolutionary processes using case studies and experimental data.	3	U,R
III	HSZO 301	Diversity of Animal-I (Chordates)	CO1: Explain the distinguishing characteristics and classification of chordates, including the major subphyla: Urochordata, Cephalochordata, and Vertebrata.	2,7	U,R
			CO2: Describe the anatomical and physiological features of different classes of chordates, such as fishes, amphibians, reptiles, birds, and mammals.	3	U,R
			CO3: Analyze the evolutionary relationships among chordates using morphological and genetic data.	2,1	U,R
			CO4: Discuss the adaptive strategies and ecological roles of various chordate groups in different environments.	5,2,3,4	U,R, A, An
			CO5: Conduct comparative studies of chordate specimens to identify key adaptations and evolutionary trends.	3	U,R
III	HSZO 302	Animal Physiology I	CO1: Explain the basic principles of animal physiology, including homeostasis, and the roles of various organ systems.	2,7	U,R
			CO2: Describe the structure and function of the nervous and endocrine systems, and their roles in regulating physiological processes.	3	U,R
			CO3: Discuss the mechanisms of muscle contraction and the physiology of the muscular system.	2,1	U,R
			CO4: Analyze the processes involved in cardiovascular and respiratory systems, including circulation, gas exchange, and regulation of breathing.	5,2,3,4	U,R, A, An

			CO5: Investigate the principles of renal physiology and osmoregulation, including the structure and function of the excretory system.	3	U,R
III	HSZO 303	Animal behavior and Chronobiology	CO1: Explain the fundamental principles of animal behavior, including innate and learned behaviors, and the methods used to study them.	2,7	U,R
			CO2: Describe the mechanisms underlying different types of animal behaviors, such as foraging, mating, social interactions, and communication.	2,7	U, R
			CO3: Discuss the role of evolutionary processes in shaping animal behavior and the adaptive significance of various behaviors in different ecological contexts.	5,6	E,C
			CO4: Analyze the concepts of chronobiology, including circadian rhythms, biological clocks, and their physiological and ecological implications.	1,6	R,C
			CO5: Investigate the impact of environmental factors, such as light and temperature, on the behavioral rhythms of animals and their synchronization with external cues.	3,4,5	A,An,E
III	HSZO 304	Microbiology and Parasitology	CO1: Explain the fundamental principles of microbiology, including microbial structure, metabolism, and genetics.	5,6	E,C
			CO2: Describe the diversity of microorganisms, including bacteria, viruses, fungi, and protozoa, and their roles in infectious diseases and environmental processes.	2,7	U, R
			CO3: Discuss the mechanisms of microbial pathogenesis, including virulence factors, host-pathogen interactions, and immune responses.	5,6	E,C
			CO4: Analyze the epidemiology and transmission of infectious diseases, including the role of vectors and reservoirs in disease spread.	1,6	R,C
			CO5: Identify and characterize medically important parasites, including protozoa, helminthes, and arthropods, and their life cycles, pathogenesis, and control strategies.	3,4,5	A,An,E

Practical's	HSZO 351	Zoology Practical-III	CO1: Demonstrate proficiency in laboratory techniques for studying various aspects of animal anatomy, physiology, and behavior.	5,2,3,4	U,R, A, An
			CO2: Conduct experiments and observations to investigate the diversity and adaptations of different animal groups, including vertebrates and invertebrates.	2,7	U, R
			CO3: Analyze and interpret data collected from practical exercises to draw conclusions about biological phenomena and ecological relationships.	5,6	E,C
			CO4: Apply taxonomic keys and classification techniques to identify different animal species and understand their evolutionary relationships.	1,6	R,C
			CO5: Develop skills in scientific communication by effectively documenting experimental procedures, observations, and findings in laboratory reports.	3,4,5	A,An,E
IV	HSZO 401	Comparative anatomy and Biology of Vertebrates	CO1: Explain the structural and functional similarities and differences among vertebrate groups, including fishes, amphibians, reptiles, birds, and mammals.	2	U,R
			CO2: Describe the anatomical features of major vertebrate organ systems, including the nervous, circulatory, respiratory, digestive, and reproductive systems.	2,7	U, R
			CO3: Analyze the evolutionary adaptations of vertebrates to different environments and ecological niches.	5,6	E,C
			CO4: Discuss the phylogenetic relationships and evolutionary trends within the vertebrate lineage, based on comparative anatomical and molecular data.	1,6	R,C
			CO5: Apply comparative anatomical principles to identify vertebrate specimens and infer their ecological roles and evolutionary histories.	3,4,5	A,An,E

IV	HSZO 402	Animal Physiology II	CO1: Explain advanced concepts in animal physiology, including neurophysiology, endocrinology, and integrative physiology.	6, 7	U,R
			CO2: Describe the mechanisms of neuronal signaling, including action potentials, synaptic transmission, and sensory processing.	2,7	U, R
			CO3: Analyze the regulation of physiological processes by endocrine glands and hormones, including feedback mechanisms and hormone interactions.	5,6	E,C
			CO4: Discuss the principles of muscle physiology, including excitation-contraction coupling, muscle metabolism, and muscle fatigue.	1,6	R,C
			CO5: Investigate physiological adaptations of animals to extreme environments, such as high altitude, deep-sea, and polar regions, and their implications for survival and function.	3,4,5	A,An,E
IV	HSZO 403	Immunology	CO1: Explain the basic principles of the immune system, including innate and adaptive immunity, antigen recognition, and immune cell activation.	6, 7	U,R
			CO2: Describe the cellular and molecular components of the immune system, including lymphocytes, antibodies, cytokines, and antigen-presenting cells.	2,7	U, R
			CO3: Discuss the mechanisms of immune responses to pathogens, including humeral and cell-mediated immunity, inflammation, and immune memory.	5,6	E,C
			CO4: Analyze the role of the immune system in health and disease, including autoimmune diseases, allergies, and immune deficiencies.	1,6	R,C
			CO5: Evaluate the applications of immunology in medicine, including Vaccination, immunotherapy, and diagnostics.	3,4,5	A,An,E
IV	HSZO 404	Applied Zoology	CO1: Apply knowledge of animal biology to address practical problems in various fields such as agriculture, veterinary science, conservation, and biotechnology.	6, 7	U,R
			CO2: Identify and classify economically important animals and their roles in ecosystems and human societies.	2,7	U, R
			CO3: Utilize techniques and methodologies in applied zoology, including field surveys, laboratory analyses, and experimental design.	5,6	E,C

			CO4: Analyze the impact of human activities on animal populations, habitats, and biodiversity, and propose conservation strategies.	1,6	R,C
			CO5: Evaluate the ethical, social, and economic implications of human-animal interactions and propose sustainable management practices.	3,4,5	A,An,E
IV	HSZO 451	Zoology Practical-IV	CO1: Demonstrate advanced laboratory techniques for studying the anatomy, physiology, and immunology of vertebrate animals.	6, 7	U,R
			CO2: Conduct experiments and investigations to explore physiological adaptations of vertebrates to their environments and evaluate their implications for animal health and survival.	2,7	U, R
			CO3: Apply immunological techniques, such as ELISA and flow cytometer, to analyze immune responses in vertebrates and assess their significance in disease resistance and immunity.	5,6	E,C
			CO4: Utilize comparative anatomical approaches to identify and compare anatomical structures among vertebrate groups and infer their evolutionary relationships.	1,6	R,C
			CO5: Integrate knowledge from applied zoology to propose solutions for practical issues related to wildlife conservation, veterinary medicine, and sustainable management of animal populations.	3,4,5	A,An,E
V	HSZO 501	Biochemistry	CO1: Explain the fundamental concepts of biochemistry, including the structure and function of biomolecules such as proteins, carbohydrates, lipids, and nucleic acids.	2	U,R
			CO2: Describe the biochemical pathways involved in metabolism, including glycolysis, Krebs cycle, and oxidative phosphorylation.	2,7	U, R
			CO3: Analyze the regulation of gene expression at the molecular level, including transcriptional and translational control mechanisms.	5,6	E,C
			CO4: Discuss the biochemical basis of diseases and disorders, including metabolic diseases, genetic disorders, and cancer.	1,6	R,C
			CO5: Apply biochemical techniques, such as chromatography, electrophoresis, and spectrophotometry, to analyze and characterize biomolecules and metabolic pathways.	3,4,5	A,An,E

V	HSZO 502	Wild conservation management life and	CO1: Understand the principles and objectives of wildlife conservation and management, including biodiversity conservation, habitat restoration, and species recovery programs.	2	U,R
			CO2: Analyze the factors affecting wildlife populations, including habitat loss, fragmentation, pollution, climate change, and human-wildlife conflicts.	2,7	U, R
			CO3: Evaluate conservation strategies and techniques, such as protected areas management, captive breeding, translocation, and community-based conservation initiatives.	5,6	E,C
			CO4: Discuss the ethical, legal, and socio-economic issues related to wildlife conservation and management, including sustainable use of natural resources and wildlife tourism.	1,6	R,C
			CO5: Apply knowledge of wildlife ecology and behavior to develop conservation plans and management practices aimed at preserving biodiversity and ecosystem integrity.	3,4,5	A,An,E
V	HSZO 503	Bio techniques, Instrumentation and Bioinformatics	CO1: Understand the principles and applications of biotechnological techniques, including DNA cloning, PCR, DNA sequencing, and recombinant DNA technology.	2	U,R
			CO2: Describe the instrumentation used in biotechnology research, including spectrophotometers, centrifuges, electrophoresis systems, and PCR machines.	2,7	U, R
			CO3: Analyze biological data using bioinformatics tools and databases to study genetic sequences, protein structures, and metabolic pathways.	5,6	E,C
			CO4: Develop practical skills in biotechnological laboratory techniques, including DNA extraction, gel electrophoresis, and bioinformatics analysis.	1,6	R,C
			CO5: Apply biotechnological methods and bioinformatics tools to address research questions in various fields, including medicine, agriculture, environmental science, and forensics.	3,4,5	A,An,E

V	HSZO 504	Apiculture	CO1: Understand the biology and behavior of honeybees, including their life cycle, social structure, and communication.	2	U,R
			CO2: Describe the equipment and techniques used in beekeeping, including hive management, colony inspection, and honey extraction.		
			CO3: Analyze the role of bees in pollination and ecosystem services, and the importance of beekeeping in agriculture and biodiversity conservation.	2,7	U, R
			CO4: Discuss the factors affecting bee health and the management strategies for preventing diseases, parasites, and environmental stressors.	5,6	E,C
			CO5: Develop practical skills in apiculture, including hive construction.	1,6	R,C
V	HSZO 551	Zoology Practical-V	CO1: Demonstrate practical skills in biochemical techniques, including spectrophotometry, chromatography, and electrophoresis, for analyzing biomolecules and metabolic pathways.	2	U,R
			CO2: Apply knowledge of wildlife conservation and management principles to design and implement field surveys and monitoring programs aimed at assessing wildlife populations and habitats.	2,7	U, R
			CO3: Utilize biotechnological tools and instrumentation, such as PCR machines and bioinformatics software, to analyze genetic sequences, protein structures, and metabolic pathways in wildlife and apicultural contexts.	5,6	E,C
			CO4: Develop practical skills in apiculture, including hive management, colony inspection, disease diagnosis, and honey extraction, to support sustainable beekeeping practices and ensure bee health.	1,6	R,C
			CO5: Integrate knowledge from biochemistry, wildlife conservation, bio techniques, and apiculture to propose interdisciplinary approaches for addressing practical issues related to wildlife health, biodiversity conservation, and sustainable agriculture.	3,4,5	A,An,E

VI	HSZO 601	Animal Biotechnology	CO1: Understand the principles and applications of biotechnology techniques in animal research and industry, including genetic engineering, cloning, and trans genesis.	7	U,R
			CO2: Describe the use of molecular biology tools, such as PCR, gene expression analysis, and gene editing technologies, in studying animal genetics and physiology.	2,7	U, R
			CO3: Analyze the ethical, legal, and societal implications of animal biotechnology, including animal welfare, biosafety, and regulatory issues.	5,6	E,C
			CO4: Discuss the potential applications of animal biotechnology in agriculture, medicine, conservation, and biopharmaceutical production.	1,6	R,C
			CO5: Develop practical skills in animal biotechnology, including tissue culture, gene manipulation, and recombinant protein expression, to address research questions and industry needs.	3,4,5	A,An,E
VI	HSZO602	Environment and Public health	CO1: Understand the interrelationships between environmental factors, human health, and disease transmission, including the impact of pollution, climate change, and habitat destruction.	7	U,R
			CO2: Describe the principles of environmental epidemiology and risk assessment, including methods for identifying environmental hazards and evaluating their health effects.	2,7	U, R
			CO3: Analyze the role of public health policies and interventions in addressing environmental health challenges, including sanitation, water quality management, and vector control.	5,6	E,C
			CO4: Discuss the importance of community engagement and participation in environmental health initiatives, including advocacy, education, and empowerment.	1,6	R,C
			CO5: Apply knowledge of environmental health principles and practices to develop strategies for promoting environmental sustainability, protecting public health, and preventing disease outbreaks.	3,4,5	A,An,E

VI	HSZO603	Research methodology And Biostatistics	CO1: Understand the principles of research design, including hypothesis formulation, sampling techniques, and experimental controls.	7	U,R
			CO2: Describe quantitative and qualitative research methods used in biological and health sciences, including surveys, experiments, interviews, and case studies.	2,7	U, R
			CO3: Analyze data using statistical techniques, including descriptive statistics, inferential statistics, regression analysis, and hypothesis testing.	5,6	E,C
			CO4: Interpret research findings and draw valid conclusions based on statistical analysis and critical evaluation of evidence.	1,6	R,C
			CO5: Apply research methodology and biostatistics principles to design and conduct scientific investigations, evaluate research literature, and communicate research findings effectively.	3,4,5	A,An,E
VI	HSZ0604	Medical Diagnostics, Health and Hygiene	CO1: Understand the principles and techniques of medical diagnostics, including various laboratory tests and imaging technologies.	2,7	U, R
			CO2: Apply knowledge of health and hygiene practices to promote disease prevention and overall well-being in different populations.	5,6	E,C
			CO3: Demonstrate proficiency in performing and interpreting diagnostic tests for common diseases and health conditions.	1,6	R,C
			CO4: Analyze and evaluate the effectiveness of hygiene protocols in clinical and community settings to control infections.	3,4,5	A,An,E
			CO5: Develop and implement health education programs to raise awareness about hygiene, disease prevention, and health maintenance.	5,6	E,C

VI	HSZO651	Zoology Practical: Practical Training & dissertation-VI	CO1: Demonstrate practical skills in animal biotechnology techniques, such as tissue culture, gene manipulation, and recombinant protein expression, through hands-on laboratory training.	5,2,3,4	U,R, A, An
			CO2: Apply knowledge of environmental health principles and public health policies to design and implement research projects aimed at assessing the impact of environmental factors on animal health and welfare.	5,2,3,4	U,R, A, An
			CO3: Utilize research methodology and biostatistics principles to develop research proposals, collect and analyze data, and draw valid conclusions in zoological research contexts.	5,2,3,4	U,R, A, An
			CO4: Design and conduct independent research projects or experiments in zoology, integrating theoretical concepts from physics and biology to investigate ecological, physiological, or biotechnological questions.	5,6	E,C
			CO5: Present research findings in written dissertation reports or oral presentations, following standard scientific communication formats and conventions, and defend the research outcomes in a scholarly forum.	5,2,3,4	U,R, A, An

B.Sc. MATH (HONS) (PSO's)

PSO 1	Think in a critical manner.
PSO 2	Familiarize the students with suitable tools of mathematical analysis to handle issues and problems in mathematics and related sciences.
PSO 3	Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of mathematics and statistics.
PSO4	Provide students sufficient knowledge and skills enabling them to undertake further studies in mathematics and its allied areas on multiple disciplines concerned with mathematics.
PSO5	Encourage the students to develop a range of generic skills helpful in employment, internships and social activities.
PSO 6	Ability to learn and apply the computer programming in C.
PSO 7	Recognize the importance and value of Mathematical thinking, training and approach to problems solving on a diverse variety of disciplines.
POS 8	Restate investigative questions in terms of a statistical model or algorithm and demonstrate the ability to communicate statistical result verbally and in writing to both technical and non-technical.

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSOs addressed	Cognitive levels
I	HSMA101	Discrete Mathematics	CO1: Analyze logical propositions via truth tables.	1, 3, 4	R, U, A, AN, E
			CO2: Prove mathematical theorems using mathematical induction.		
			CO3: Understand sets and perform operations and algebra on sets.	5,6	E,C
			CO4: Determine properties of relations identify equivalence and partial order relations, sketch relations.	1,6	R,C
			CO5: Identify functions and determine their properties.	3,4,5	A,An,E
I	HSMA102	Calculus-I	CO1: On successful completion of this course, Students is able to Understand the idea of derivative, tangent line to the graph of a function	1, 2	U, A, AN
			CO2: How a derivative can be used to describe the rate of change of one quantity with respect to another.	5,6	E,C
			CO3: How to relate the geometric ideas to the analytic ideas.	1,6	R,C
I	HSMA103	Three Dimensional Geometry and Vector Calculus	CO1: Understand the basic applications of coordinate geometry.	1, 2, 3, 4	U, A
			CO2: They will develop ability to pursue advanced studies and research in pure and applied mathematical science.	5,6	E,C
			CO3: Determine the derivatives of vectors and their properties	1,6	R,C
			CO4: Understand the various operators and their applications in vector calculus	3,4,5	A,An,E
			CO5: Understand the concept of line, surface and volume integration with their relationship.	5,6	E,C
I	HSMA104	Number Theory-I	After completion of the course students are expected to be able to:	1, 2, 4, 7	U, A
			CO1: Determine the quotients and remainders from integer division	5,6	E,C
			CO2: Apply Euclid's algorithm and backwards substitution	1,6	R,C
I	HSMA151	Mathematics Practical	On successful completion of this course students are able to CO1: Understand the linear optimization theory and its applications.	1, 2, 4, 7	R, U
			CO2: Identify the appropriate methods for the efficient computation of optimal solutions of a problem and a set of linear constraints.	5,6	E,C

II	HSMA201	Graph Theory	The students will be able to CO1: Understand the basics of graph theory and their various properties.	3,4	U, A, AN, C
			CO2: Model problems using graphs and to solve these problems algorithmically.	5,6	E,C
			CO3: Apply graph theory concepts to solve real world applications like routing, TSP/traffic control, etc.	1,6	R,C
II	HSMA202	Calculus-II	On successful completion of this course, Students will enable to CO1: Sketch curves in a plane using its mathematical properties in the different coordinate systems of reference.	2,3,7	U, C
			CO2: Compute the length of curve, area bounded by the curves, area and volume of surface of solid of revolution.	5,6	E,C
II	HSMA203	Optimization theory	On successful completion of this course students are able to CO1: Understand the linear optimization theory and its applications.	1,2,4,5,7	R, U
			CO2: Identify the appropriate methods for the efficient computation of optimal solutions of a problem and a set of linear constraints.	5,6	E,C
II	HSMA204	Number Theory-II	After completion of the course students are expected to be able to: CO1: Understand the definitions of congruence, residue classes and least residues add and subtract integers, modulo n, multiply integers and calculate powers, modulo n	1,2,4,7	U, A
			CO2: Determine multiplicative inverses, modulo n and use to solve linear congruence.	5,6	E,C
			CO3: Understand the theory of quadratic residue	1,6	R,C
II	HSMA251	Mathematics Practical	On successful completion of this course students are able to CO1: Understand the Transportation Problem and its applications in daily life	1,2,4,5,7	R, U
			CO2: Identify the appropriate methods for the efficient computation of optimal solutions of an assignment problem	5,6	E,C

III	HSMA301	Real Analysis-I	On successful completion of this course, Students CO1: Describe fundamental properties of the real numbers that lead to the formal development of real analysis.	1,3,7	U, A, E
			CO2: Comprehend regions arguments developing the theory underpinning real analysis	5,6	E,C
			CO3: Demonstrate an understanding of limits and how that is used in sequences, series and differentiation.	1,6	R,C
			CO4: Construct rigorous mathematical proofs of basic results in real analysis.	3,4,5	A,An,E
			CO5: Appreciate how abstract ideas and regions methods in mathematical analysis can be applied to important practical problems.	5,6	E,C
III	HSMA302	Differential Equation-I	On successful completion of this course students will be able to: CO1: Understand that physical systems can be described by differential equations	2,3,4,5	R, U, AN, E
			CO2: Understand the practical importance of solving differential equations	5,6	E,C
			CO3: Appreciate the importance of establishing the existence and uniqueness of solutions	1,6	R,C
			CO4: Recognise an appropriate solution method for a given problem	5,6	E,C
			CO5: Analytically solve a wide range of ordinary differential equations (ODEs)	1,6	R,C
III	HSMA303	Numerical Analysis	On successful completion of this course, students will be able to: CO1: Understand the nature and operations of Numerical Analysis, demonstrate familiarity with theories and concepts used in Numerical Analysis	3,5,6,7	U, R, A, AN
			CO2: Identify the steps required to carry out a piece of research on a topic in Numerical Analysis,	5,6	E,C
			CO3: Apply Numerical Methods to find the value of derivatives	1,6	R,C
			CO4: Solve integrals and simultaneous algebraic equations.	5,6	E,C

III	HSMA304	Operations Research-I	On completion of the course, the student will be able to: CO1: Understand the scope and classification of operation research.	3,5,7,8	U, AN, C
			CO2: Optimize the allocation of resources to demand points in the best possible way using various techniques and minimize the cost or time of completion of number of jobs by number of persons.	5,6	E,C
			CO3: Model competitive real-world phenomena using concepts from game theory.	5,6	E,C
			CO4: Analyse pure and mixed strategy games.	5,6	E,C
III	HSMA351	Mathematics Practical	On successful completion of this course students will be able to: CO1: Apply well known numerical technique to solve science and engineering problems and evaluate the results.	3,6,9	A, E
IV	HSMA401	Advanced Analysis and Metric Space	On successful completion of this course students will be able to: CO1: Develop a reasoned argument in handling problems about functions, especially those that are of bounded variation.	1,4,7	R, U, C
			CO2: Develop the ability to reflect on problems that are quite significant in the field of metric space.	5,6	E,C
IV	HSMA402	Differential Equation-II	On successful completion of this course students will be able to: CO1: Understand that physical systems can be described by differential equations.	2,3,5,	U, AN, E
			CO2: Understand the practical importance of solving differential equations	5,6	E,C
			CO3: Analytically solve a wide range of differential equations	5,6	E,C
			CO4: Solve classical linear partial differential equations (PDEs)	5,6	E,C
IV	HSMA403	Advanced Numerical Analysis	On successful completion of this course, students will be able to: CO1: Apply Numerical Methods to find the roots of Algebraic and Transcendental Equations	3,7	U, A
			CO2: Understand the operations of solving the ordinary differential equations by numerical methods	5,6	E,C

IV	HSMA404	Operations Research-II	After completion of the course, the student will be able to CO1: Formulate Network models for service and manufacturing systems	3,5,7,8	A, C
			CO2: Apply operations research techniques and algorithms to solve the Network problems.	1,2,7	U, AN, C
IV	HSMA451	Mathematics Practical	On successful completion of this course students will be able to CO1: Apply well known numerical technique to solve science and engineering problems and evaluate the results.	3,6,9	U, A, E
			CO2: Understand to solve the numerical problem by C-programming	1,2,7	U, AN, C
V	HSMA501	Abstract Algebra-I	The students who succeeded in this course, will able to CO1: Construct and compare algebraic structures and substructures and analyze a given structure in detail.	1,7	U, AN, C
			CO2: Understand a new structure based on given structures.	1,2,7	U, AN, C
V	HSMA502	Complex Analysis-I	On successful completion of this course students will be able to: CO1: Know the central importance of complex variables in analysis.	1,2,7	U, AN, C
			CO2: Grasped a deeper understanding of differentiation and integration in this setting	1,2,7	U, AN, C
			CO3: Know the tools and results of complex analysis including Cauchy's Theorem, Cauchy's integral formula	1,2,7	U, AN, C
V	HSMA503	Dynamics	Student will be able to: CO1: Learn about concept of Velocity and Acceleration.	1,2	R, U, A
			CO2: Understand the theory of Simple Harmonic Motion and Hooke's law and Motion of elastic strings.	1,2,3,8	U, A, AN, C,
			CO3: Know about various topics in dynamics such as Motion in resisting medium and Projectile motion.	1,2,3,8	U, A, AN, C,
			CO4: Learn the concept of motion on smooth curve in vertical plane and inside the circle also.	1,2,3,8	U, A, AN, C,
			CO5: Determine M.I. and P.I. of various objects	1,2,3,8	U, A, AN, C,

V	HSMA504	Statistics-I	Upon successful completion of this course, students will be able to: CO1: Organize, manage and present data.	1,2,3,8	U, A, AN, C,
			CO2: Analyse statistical data graphically using frequency distributions and cumulative frequency distributions.	1,2,3,8	U, A, AN, C,
			CO3: Analyse statistical data using measures of central tendency, dispersion and location.	1,2,3,8	U, A, AN, C,
V	HSMA551	Mathematics Practical	On successful completion of this course students will be able to CO1: Apply well known numerical technique to solve science and engineering problems and evaluate the results.	3,6,9	U, A, E
			CO2: Understand to solve the numerical problem by C-programming	1,2,3,8	U, A, AN, C,
VI	HSMA601	Abstract Algebra-II	The students who succeeded in this course, will able to CO1: Understand the concept of ideals, field of quotient, vector space and quotient space.	1,2	U, A
			CO2: Calculate the basis and dimension of vector space.	1,2,3,8	U, A, AN, C,
VI	HSMA602	Complex Analysis-II	On successful completion of this course, Students will be able to: CO1: Understand the manipulation-skills in the use of Rouche's theorem, Cauchy-Hadamard theorem,	1,2,7	U, E
			CO2: Evaluate radius of convergence.	1,2,3,8	U, A, AN, C,
			CO3: Understand the Argument Principle, the principle of Analytic Continuation and the concerned results.		
VI	HSMA603	Mechanics	After successful completion of this paper, students will able to CO1: Understand the properties of forces acting on static bodies.	1,3,4,7	U, A
			CO2: Calculate the differential equation of central orbits for different forces.	1,2,3,8	U, A, AN, C,
			CO3: Demonstrate about coplanar forces and Catenary	1,2,3,8	U, A, AN, C,

VI	HSMA604	Statistics-II	After successful completion of this paper, students will able to CO1: Use the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events.	1,2,3,8	U, A, AN, C,
			CO2: Translate real-world problems into probability models.	1,2,3,8	U, A, AN, C,
			CO3: Derive the probability density function of transformation of random variables.	1,2,3,8	U, A, AN, C,
VI	HSMA651	Mathematics Practical	On successful completion of this course students will be able to CO1: Apply well known numerical technique to solve science and engineering problems and evaluate the results.	3,6,9	U, A, E
			CO2: Understand to solve the numerical problem by C-programming	1,2,4,6	U,R,An,E,A

PROGRAMME OUTCOMES (PO's) BACHELOR OF COMMERCE (HONS.)

PROGRAMME OUTCOMES OF BACHELOR OF COMMERCE

After the successful completion of Bachelor's Degree of Commerce the students get equipped with the following specialties:

1. They acquire the in-depth knowledge of principles and theories of commerce including economics, finance, accounts, marketing, entrepreneurship, trade & industry.
2. They become the beholder of special and essential business skills like critical thinking, decision making, problem solving, risk analyzing and minimizing etc. and they learn how to apply theoretical knowledge to the real business world.
3. The graduates get a strong hand on financial literacy like formulation of financial statements, budgeting, investment analysis, audit process, income tax laws, inventory management, risk and uncertainty management etc.
4. The commerce graduate becomes proficient in team work and leadership.
5. They develop an innovative and entrepreneurial mindset.
6. They acquire the knowledge about the policy formulation and implementation machinery of the nation its problems and the way out.
7. The commerce graduates get the knowledge about the banking and financial intermediaries, their role in the nation building and propagation of economic growth and development.
8. The graduates further move towards research in the field of commerce

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSOs addressed	Cognitive levels
I	HCEF101	Business Economics	CO1: Develop the skills in business operation and management practices.	1	U
			CO2: Learn the concepts and techniques used in Micro & Macro Economic theory.	1	U
			CO3: Apply this knowledge in Business decision-making.	2	U,A
			CO4: Enhance logical and practical thinking process among the students, including the ability to understand economic policies and theories in reference to persisting problems and help them to make intelligent decisions.	1,3,4	U,A,An
I	HCEF102	Indian Banking	CO1: Acquire knowledge of working of Indian Banking system	1,3	U,A
			CO2: Become familiar with the impact of government policy and regulations on the banking industry.	1,4,5	U,An,E
			CO3: Evaluate the performance and mechanisms of the banking industry.	1, 3,5	U,A,E
			CO4: Understand the importance to be updated on the developments of the banking sector and practice the same by knowing the horizontal and vertical linkages	4,5	An,E
I	HCEF103	Financial Management	CO1: Acquaint students with the techniques of financial management and their applications for business decision making	1,2	U,R
			CO2: Familiarize students with MS Excel or spreadsheet applications of financial management and decision making.	1,3	U,A
			CO3: Understand management of working capital and estimate the same for an organization.	1,3,5	U,A,E
			CO4: Identify courses of action in financial environment that would result in maximization of wealth of an organization.	1,2	U,R

I	HCEF104	Business Budgeting	CO1: Understand what a budget is, who decides it, how it works, how it affects them and how to have a meaningful input to it	1,4,5	U,An,E
			CO2: Be equipped with the basic concepts and tools of modern program and outcomes-based budgeting	1,3,4	U,A,An
			CO3: Be introduced to key budgeting texts, guidebooks and working examples of modern program and outcomes-based budget documents	3,4,5	A,An,E
			CO4: Be able to assist public officials to understand the close relationship between their agency's strategic plan and its budget document	1,2,4,6	U,R,An,E,A
II	HCEF201	Managerial Economics	CO1: Understand the Role of Managerial Economics in Decision Making	1,3,4	U,A,An
			CO2: Understand the choices made by a rational consumer	1,2,6	U,R, E
			CO3: Learn about the relationships between production and costs	2, 3	R,A,
			CO4: Apply economic principles to management decisions	2, 4, 5	R,An, E
II	HCEF202	Financial System	CO1: Learn different financial systems and their framework.	1	U
			CO2: Learn about the Cost Sheet for Single Output/Unit Costing Students studies non-banking financial institutions, their role in financial system, sources of finance and RBI guidelines	3,4,5	A,An,E
			CO3: Learn the concept of microfinance and its importance in rural economy.	1,2,4,6	U,R,An,E,A
			CO4: Acquaint students with the techniques of financial management and their applications for business decision making	1,2	U,R
II	HCEF203	Business Finance	CO1: Understand the awareness of the global environment in which financial management operates	2, 4,5	U,An,E
			CO2: Utilize information by applying a variety of business and industry software and hardware to major financial function.	1,5	U,E
			CO3: Determine the extrinsic and intrinsic value from the projected financial statements	1,2,4	U,R,An
			CO4: Learn about the concept of sources of redemption of debentures and redemption of preference shares.	3,4, 5	A,An,E

II	HCEF204	Capital Expenditure Decisions	CO1: Recognize as well as prioritize capital investments on the basis of maximum returns to the business.	2, 5	A,E
			CO2: Provide necessary inputs in the form of concepts, theories and financial management tools and techniques related to capital expenditure decisions	1,2,4,6	U,R,An,E,A
			CO3: Able to learn about profitable investment decision.	1,2,4	U,R,An
			CO4: Able to understand working capital management practices.	1,4,5	U,An,E
III	HCEF301	Theory and Practice of Economic Administration	CO1: Develop the skills of planning, budgeting and implementing the policies in business operations and management practices.	1	U
			CO2: Acquire the knowledge of institutional finance, savings, investments and finance, non-banking financial institutions and foreign capital investment and their coordination with NITI AAYOG plans.	1,2,4,6	U,R,An,E,A
			CO3: Evaluate the performance of all India development banks and State level financial institutions, non-banking financial institutions and international investment banks in state finances.	3,5	A,E
			CO4: Examine sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence.	1,4	U,An
			CO5: Acquire knowledge of working of Indian Banking system.	1,3,4, 5	U,A,An,E
III	HCEF302	Macro-Economic Theory	CO1: Develop the broad conceptual frameworks which will enable students to understand and comment upon real economic issues like inflation, money supply, GDP and their interlink ages	1,4	U,An
			CO2: Critically evaluate various macroeconomic policies in terms of a coherent logical structure	1,3	U,A
			CO3: Formal modeling of the macro economy in terms of analytical tools	1,,3,4	U,A,An
			CO4: Understand various theories of output, economic and employment.	1,3,4	U,A,An
III	HCEF303	Project Planning And Production Decision	CO1: Understand the concept of project planning	1	U
			CO2: Prioritize risks for further planning of projects	1	U
			CO3: Develop cost-effective risk management plans of projects and incorporate them in their execution.	1,3, 4	U,A,An
			CO4: Define basic of project planning and understand the lifecycle of any given project.	1,3,4, 5	U,A,An,E

III	HCEF304	Development Banking	CO1: Understand the Dynamics of Indian Banking Sector.	1	U
			CO2: Familiarize students with the Reforms in the Banking Sector.	1,2	U,R
			CO3: Comprehend the need, definition, functions and economic significance of development banks.	3,4,5	A,An,E
			CO4: Get the knowledge about problems challenges, opportunities and future of banking environment.	1,3, 5	U,A,E
IV	HCEF401	Public Enterprises In India	CO1: Understand the Role of Public Sector and their Evaluation in Indian Economic Development.	1,3, 5	U,A,E
			CO2: Analyze the need and obstacles to privatization in India and their impact on Indian Economy	1,3, 5	U,A,E
			CO3: Evaluate the impact of the new economy on managerial decision-making, and measurement of national income and economic welfare.	1,3, 4,5	U,A,An,E
			CO4: Understand the major policy regimes of government in public enterprises in India.	1, 2,3,5	U,R, A,E
IV	HCEF402	Monetary Economics	CO1: Understand how an economy functions efficiently and how monetary policy can help the economy adjust from one equilibrium state to another.	1, 2	U,R
			CO2: Analyze monetary policy formulation and execution.	1,3, 4,5	U,A,An,E
			CO3: Gain the applied understanding of monetary economics and the significance and working of Monetary policy.	3, 4,5	A,An,E
			CO4: Analyze the existence of money, explaining why it is demanded by individuals and used in the trading process.	3, 4,5	A,An,E
IV	HCEF403	Project Management And Control	CO1: Understand Comprehensive fundamental and technical knowledge of Project Management and control.	3, 4,5	A,An,E
			CO2: Handle the project through project management process and Analyzing them through network techniques and handle financial aspects of project.	1,3,4,5	U,A,An,E
			CO3: Successfully complete a project, considering factors such as task dependencies and task lengths.	1,3,4,5	U,A,An,E
			CO4: Understand project managements and their applications in managing projects in order to review and report them.	1,3,4,5	U,A,An,E

IV	HCEF404	Structure of Financial Institution	CO1: Provide an insight to students into the functions and role of varied and multiple constituents of the Indian financial system.	1,2,4	U,R,An
			CO2: Understand the theoretical foundation of studies in the field of banking, Investment institution, Insurance organization and financial services	1,4,5	U,An,E
			CO3: Comprehend and grasp the different mechanisms and channels for raising finance which enables economy to operate in globalized scenario	1,3,4	U,A,An
			CO4: Understand the role of financial system regulators and its major players	1,3,4	U,A,An
V	HCEF501	International Trade and Finance	CO1: Develop comprehensive understanding of theories of International Trade and Finance.	1	U
			CO2: Become aware of the different kinds of foreign exchange management techniques including hedging, currency arbitrage, etc.	1,2	U
			CO3: Understand Policy Formulation regarding export processes.	5, 6, 7	U,A,C
			CO4: Develop a fair understanding of the international financial tactics including the international trade, international investment scenario and various kinds of exposures.	5,6,7,8	U,R
V	HCEF502	Indian Economic Environment	CO1: Understand the environment of Indian Economy.	1	U
			CO2: Help in students to develop comprehensive understanding of Theories of economic environment and their application.	2,3,4	U,A
			CO3: Help students to comprehend concepts and theories related to economic environment.	1,2,3	U,R
			CO4: Manage the public funds in the nation's economy.	2,3	U,A ,
V	HCEF503	Rural Development	CO1: Provides information about opportunities for employment in rural india and various programmes and schemes of Govt.	4,5	U,A
			CO2: Contribute in plan formation for improving the quality of life of the rural population.	1,4,5	U, R,A
			CO3: Imbibe understanding the problems of rural people.	1	U,R
			CO4: Understand the key issues of rural community such as health related issues of rural Community.	1,2	U, R

V		Public Finance	CO1: Enhance knowledge and understanding regarding inequality and factors affecting it.	2, 3, 4	U, A
			CO2: Develop comprehensive understanding of theories of public Expenditure and their application.	2,3,4	U,A
			CO3: Understand the public sector reform agenda which will focus on public finance issues.	1,2,3	U,R
			CO4: Develop a comprehensive understanding of theories of public expenditure and their application.	2,3	U,A,An
VI	HCEF601	Foreign Exchange	CO1: Develop understanding regarding the different types of exchange rate and related risks.	1,2, 3,	U, A
			CO2: Get complete understanding of the forex market, its theories.	1,4,5	U, A
			CO3: Understand the formulation of effective trade ideas, through the application of rigorous market Analysis and critical thinking.	5, 6,7,8	U,A, C,E
			CO4: Identify foreign exchange platforms that facilitate foreign exchange transactions.	7,8	U,A,C
VI	HCEF602	Business Environment in India	CO1: Familiarize with the nature of business environment and its components.	1, 2,3	U,A
			CO2: Develop the ability to understand impact of various Environmental factors on business.	2,3,4, 6	U,A, C,E
			CO3: Develop Awareness regarding the social responsibility, understanding of Industrial policies.	1, 5, 6	U,A
			CO4: Demonstrate and develop conceptual framework of business environment and it will also generate Interest in international business.	5,6,7	U,A, C,E
VI	HCEF603	Principles of Co-operation	CO1: Identify the practice of co-operative education and training as well as institutional arrangements Made for cooperatives.	1,4,5	U, R,A
			CO2: Recognize the universally accepted principles of the co-operative enterprises with a background history.	1,4,5	U, R,A
			CO3: Understand about the Rajasthan State co-operative organization.	1,4,5	U, R,A
			CO4: Gain the knowledge and awareness about Cooperative Credits and its Role in Rural Development.	2,5	U,R,A

VI	HCEF604	Central Financial Administration	CO1: Develop the understanding about Theory of Central Finance, Centre-state Financial Relations, Finance Commission, Centre and State Finance	1,4,5	U,R,A
			CO2: Understands different type of Public Debt.	1, 2	U,R,A
			CO3: Understand the intricacies of public finance and public policy.	1,5,6	U, R,A
			CO4: Develop understanding about Budgets, Tax Evasion, Parallel Economy, and Impact of Demonetization on tax evasions and parallel economy.	1, 2,3,4	U,R,A

BUSIENSS ADMINISTRATION (BADM HONS.) (PSO's)

S. No.	On completing of Bachelor of Commerce, the student will be able to:
PSO 1	Graduates will grasp fundamental concepts such as management, entrepreneurship, marketing, Business laws and organizational behaviour.
PSO 2	Students would develop strong analytical skills for assessing financial data, marketing tactics, trends, and making informed decisions.
PSO 3	Graduates may adeptly convey ideas both verbally and non-verbally, essential for professional success understanding global business practices, international trade dynamics, and cultural nuances in today's interconnected world.
PSO 4	They would be able to recognize ethical and legal considerations in decision-making paramount, with graduates expected to uphold integrity in their professional conduct.
PSO 5	They will develop leadership acumen and teamwork proficiency vital for career progression, enabling graduates to effectively lead and collaborate.
PSO 6	Entrepreneurial thinking of graduates would enhance to spot opportunities, take calculated risks, and innovate in diverse business contexts.
PSO 7	Given dynamic business environments, graduates would exhibit a drive for continuous learning and professional development to stay abreast of industry advancements.

Semester	Course Code	Course Title	Course Outcomes on completing the course, the student will be able to:	Attributes	
				PSO Addressed	Cognitive Levels
I	HCBM101	Business Laws	CO1: The students would be able to deal with the legal aspect of different business situations.	2,4,6,7	A,An,E
			CO2: The outcome of this programme will help to accumulate and analyse requisite legal knowledge and its application about the legal framework for starting a business venture.	1,2,4,6,7	An,U,C
			CO3: The students would be able to interpret various legal provisions and learn how to apply them in building their career	1,2,4,6	U,A,An
			CO4: Students would learn the rules regarding the Contract of Sale, Distinction between Sale & Agreement to sell, Condition & Warranty, Doctrine of Caveat Emptor, etc.	1,3	U,R
I	HCBM102	Business Organisation	CO1: After Graduating with this course students will develop key management skills to get employment, and know about business world to be own boss.	1,2,3,4,5,6,7	U,R,An,E,A
			CO2: Business Organisation would enhance logical and practical thinking of multiple disciplines among the students.	2,3,4,5,6,7	U,R,An,E,A
			CO3: To help students develop skills for applying these concepts to the solution of business problems.	2,3,4,5,6,7	U,R,An,E,A
			CO4: Graduates would learn the art of incorporating and managing an organization's practical contingencies.	2,3,4,5,6,7	U,R,An,E,A
I	HCBM103	Human Resource Management	CO1: Demonstrate an understanding of key terms, theories/concepts and practices within the field of HRM.	1,2,4	U,R
			CO2: Demonstrate competence in development and problem-solving in the area of HR Management.	1,3,5,6	U,A,An
			CO3: Be able to identify and appreciate the significance of the ethical issues in HR.	1,3,5,6	U,A,An
			CO4: Provide innovative solutions to problems in the fields of HRM.	3,4,5,6,7	U,R,An,E,A
I	HCBM104	Corporate Communication	CO1: The students will penetrate the communication skills used in business world.	1,2,3,4	U,R,An,E,A
			CO2: The students will be able to use communication skills for effective business writing, effective business communications, research approaches.	2,4,5,6,7	U,A,An

			CO3: It will enable them to enhance their verbal communication using modern technology.	4,6,7	U,A,An
			CO4: Students will be conversant with business or official communication terms and writing skills.	4,6,7	U,A,An
II	HCBM201	Commercial Legislations	CO1: The students would be able to deal with the legal aspect of different business situations.	2,4,6,7	U,A,An
			CO2: The outcome of this programme will help to accumulate and analyse requisite legal knowledge and its application about the legal framework for starting a business venture.	1,2,4,6,7	U,R,An,E,A,C
			CO3: The students would be able to interpret various legal provisions and learn how to apply them in building their career	1,2,4,6	U,R,An,E,A
			CO4: Students would learn the rules regarding the Contract of Sale, Distinction between Sale & Agreement to sell, Condition & Warranty, Doctrine of Caveat Emptor, etc.	1,3	U,R
II	HCBM202	Entrepreneurship	CO1: Graduate students advance their skills in customer development, customer validation, competitive analysis, and iteration while utilizing design thinking.	1,6,7	U,R,An,E,A,C
			CO2: Students will know that Business success is the outcome of an entrepreneurial skill and risk taking and innovation.	1,6,7,5	U,R,An,E,A,C
			CO3: Graduates would be able to apply entrepreneurial skills.	4,6,7	A,An
			CO4: Students would be able to know about various governmental schemes availing for MSMEs and will take advantage of them.	1,3	U,R
II	HCBM203	Marketing Management	CO1: Students will demonstrate knowledge of the legal and ethical environment impacting business organizations and exhibit an understanding and appreciation of the ethical implications of decision.	1,2,3,4,5,6	U
			CO2: Students will demonstrate an understanding of and appreciation for the importance of the impact of globalization	1,4	U,R,An,A
			CO3: Graduates will demonstrate knowledge of current information, theories and models, and techniques and practices in all of the major business disciplines.	5,7	E,C
			CO4: Understanding of areas like the general Accounting and Finance, Information Technologies, Management, Marketing, and Quantitative Analysis.	1,4	U

II	HCBM204	Personality Development	CO1: After studying this paper a student will definitely have personal Development, improved interpersonal competence, social responsibility and cognitive and practical skills.	4,5,7	A
			CO2: Personal development helps a student to improve his self-esteem and like a person as one want to become.	1,2,3,4,5,6,7	U,R,A,E,A
			CO3: A graduate student also learns to respect, accept, and love, will believe in himself and know that he is capable of achieving growth and his goals.	2,3,4,5,6,7	S,A,C
			CO4: It would enhance his/her whole personality which will help him/her outstand in the business world.	2,3,4,5,6,7	An,E,A
III	HCBM301	Company Law	CO1: Graduate students will understand the Company Act that how a company works in business and also get knowledge about Indian law and the importance of rules and regulation of a company according to prescribed Act.	1,2,3,6,7	U,R,An
			CO2: A Graduate student would be able to understand the practices of Director and promoter of company and can do the related works in the Companies.	1,2,3,6,7	U,An,A
			CO3: Students would remember the duties and liabilities of members of a company and apply them in practical life.	2,3,4	R,A
			CO4: Graduates would get knowledge about the necessary documentation needed at the time of incorporation of company.	1,2,3,4,7	U,R,A
III	HCBM302	Principles of Management and Practices	CO1: Examine the functions of planning, organizing, leading, staffing and controlling.	1,2,6,7	U,An,E
			CO2: Learn and describe the primary functions of management and their importance in the work performed by managers.	1,3,4,7	U,R,A
			CO3: Evaluate and anticipate the potential effectiveness of various management styles, communications, and decisions for a given situation.	2,6,7	E,An,A,C
			CO4: Evaluate the major models of leadership and motivation, and suggest situations when they may be successfully applied.	2,4,5,6,7	E,A,C

III	HCBM303	Organisational Theory and Practices	CO1: Recognize and discuss the different perspectives of working culture in organizations.	1,2,4	U,R
			CO2: Interpret key concepts and theories with regard to individual differences and apply these appropriately to specific situations.	1,2,5,6,7	U,An,E,A
			CO3: Understand how organizational performance can be improved through the effective management of human resources.	1,3,5,6,7	An,E,A
			CO4: Students will able to accept and embrace in working with different people from different cultural and diverse background in the workplace.	1,2,4,7	U,A
III	HCBM304	Ethics , Governance and Sustainability	CO1: Comprehend the relationship between ethics, morals and values in the workplace.	1,2,6,7	An,E,A
			CO2: Explore the relationship between ethics and business and the subsequent theories of justice and economics across different cultural traditions.	1,2,5,6,7	U,E,An,C
			CO3: Critically analyzes the reasons of systematic failure of corporate governance that could spread from individual firms to entire markets or economies.	2,6,7	An,E
			CO4: Critically applies understanding of ethics of real-world contexts and gathers and analyse information by way of undertaking a research project on a topic relevant to business ethics.	1,2,5,6,7	U,R,A
IV	HCBM401	Secretarial Practices	CO1: Providing efficient support to executives and teams, including managing schedules, correspondence, and office logistics.	1,2,6,7	U,An
			CO2: Organizing and maintaining documents, records, and files with confidentiality and accuracy.	2,4,5,6,7	An,E
			CO3: Effectively conveying information through written correspondence, phone calls, and in-person interactions.	5	C
			CO4: Scheduling, preparing agendas, recording minutes, and following up on action items from meetings.	1,4	U,R,A

IV	HCBM402	Business Environment	CO1: Students would be acquainted with business objectives, dynamics of business and environment, various types of business environment and its analysis.	1,2,4	U,R
			CO2: Students would recall and relate various concepts like business ethics, ethical dilemmas, corporate culture and ethical climate. They would also be acquainted about development of various acts applicable to business in India.	1,2,4	U,R
			CO3: Students would describe and discuss Corporate Social Responsibility, Corporate Governance and Social Audit.	1,2,4	U,R
			CO4: Students would be acquainted with various strategies of Global Trade. They would also discuss Foreign Trade in India, Foreign Direct Investments and its implications on Indian Industries.	1,2,4	U,R
IV	HCBM403	Sales Promotion and Management	CO1: Familiarity with the advertising process.	1,3	U,R
			CO2: Graduates would understand the strategic role of creativity in successful advertising campaigns and brand building.	1,2,6,7	U,An,E
			CO3: Ability to pursue a career in the field of advertising and sales promotion through the knowledge gained about the field.	1,4,6,7	U,R,A
			CO4: Graduates would culminate the skills of understanding various sales promotion techniques and creating advertisements.	U	U,R,C
IV	HCBM404	Business Finance and Environment	CO1: Enhance the ability to identify ethical dilemmas within the finance setting.	2,4,5	An,E
			CO2: Develop appreciation for socially responsible actions with respect to financial decisions.	3,4,6	U,E
			CO3: Present, discuss, and defend financial decisions by using appropriate terminology.	1,3,4	R,An,E
			CO4: prepare finance professionals through the development of interpersonal and teamwork skills.	1,2	R,U

V	HCBM501	Labour Legislation	CO1: Graduate students will learn the salient features of welfare and wage legislations.	1,3	U,R
			CO2: Students will learn the laws relating to Industrial Relations, Social Security and Working conditions and also learn the enquiry procedural and industrial discipline.	1,3	U,R
			CO3: Labour Legislations would enhance logical and practical thinking process among the students, including the ability to understand businesses and their working.	2,3,4,5,6,7	An,E,C
			CO4: Graduates also to integrate the knowledge of Labour Law in General HRD Practice.	2,3,4,5,6,7	An,E,C
V	HCBM502	E-Commerce	CO1: Analyze the potential impacts of different E-Business strategies.	2,6,7	An,E,C
			CO2: They would get aware of the E-Business environment, the identification of contemporary E-Business issues, and the evaluation of their implications for organizations.	1,2,6,7	U,An,E
			CO3: Describe about the anatomy of E-Commerce applications and demonstrate about the E-Commerce consumer application.	2,6,7	U,An,E,A
			CO4: Develop the ability to evaluate the effects of business issues in relation to various E-Business model.	2,4,5	E,C
V	HCBM503	Organisational Change and Development	CO1: Gaining knowledge about organizational development process and how to change and develop organizations.	1,2,3,4,5,6,7	U,An,E,A
			CO2: Better understanding of the change management model. Skills needed to develop an action plan for the development process.	1,2,3,4,5,6,7	U,An,E,A
			CO3: Different approaches to manage organizational change and understand and utilize.	2,3,4,5,6,7	R,An,A
			CO4: Competencies to induce and manage changes at organization, group and individual levels.	5	C
V	HCBM504	Research Methodology	CO1: Understand some basic concepts of research and its methodologies.	1,2,4	U,R
			CO2: Identify appropriate research topics and select and define appropriate marketing research problem and parameters.	1,2,3,5,6,7	U,An,A
			CO3 Organizes and conduct research (advanced project) in a more appropriate manner.	1,2,3,4,5,6,7	U,R,An,E,A
			CO4: Write a research report and find solutions.	1,2,3,4,5,6,7	U,E,A,C

VI	HCBM601	Industrial Law	CO1: Be acquainted with the concepts, principles and issues connected with trade unions, collective bargaining, workers participation, grievance redressal, and employee discipline and dispute resolution.	1,3	U,R
			CO2: Enable students to understand various approaches to industrial relations and legal and alternative mechanisms to resolve labour management conflict.	1,2,3,4,5,6,7	U,R,An,E,A
			CO3: Develop understanding of constitutional provisions and industrial relations legislation.	1,3	U,R
			CO4: Understand Social and Industrial aspects and of psychology of worker.	1	U
VI	HCBM602	Production and Material Management	CO1: Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.	1,2,6,7	U,An
			CO2: Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operational environments.	2,4,5,6,7	An,E
			CO3: The skill, knowledge, and experience to forecast customer demand and plan material requirements and production accordingly.	5	C
			CO4: Understanding and confidence to apply advanced techniques and concepts to improve material requirements planning and production management.	1,4	U,A
VI	HCBM603	Marketing communication and Advertising Management	CO1: Aligns all promotional efforts for a cohesive message.	1,2,6,7	U,An
			CO2: Develops targeted campaigns and creative content.	2,4,5,6,7	An,E
			CO3: Selects optimal channels for maximum reach.	5	C
			CO4: Builds and maintains brand identity and perception.	1,4	U,A
VI	HCBM604	Group Project and Presentation (Practical)	CO1: Detailed outlining of project scope, objectives, timelines, and resources.	1,2,6,7	U
			CO2: Identifying and mitigating potential risks to project success.	2,4,5,6,7	A,E
			CO3: Effective communication and collaboration among team members.	5	C
			CO4: Assessing project outcomes against predefined metrics and delivering comprehensive reports.	1,4	U,A

GEOGRAPHY (HONS.) (PSO's)
PROGRAMME SPECIFIC OUTCOMES:

PSO 1	To read and understand maps and topographic features to look at the various aspects on the space.
PSO 2	Evaluate critical aspects of spatial phenomenon from global to local level on various time scales.
PSO 3	This is an endeavor to recognize the skill development in-social sciences with special reference to geography subject.
PSO 4	To understand the basic statistical analysis and its use in geography.
PSO 5	To understand different geographical and geomorphological processes and methods and also gain knowledge human environment inter relationship.

Semester	Course Code	Course Title	Course Outcomes	Attributes	
				PSOs addressed	Cognitive levels
I	HAGE101	Paper I - Physical Geography-I (Geomorphology)	CO1: Learn the Earth's physical form and relationships between its physical components.	2	U, R
			CO2: Understand principles of physical phenomena of the Earth, models, system theories, dynamic processes.	2, 5	U, C, R, A
			CO3: Comprehend the relationships between geomorphologic landforms, concepts, and processes.	2, 4, 5	U, C, E
I	HAGE102	Paper II - Human Geography-I	CO1: Learn the Earth's physical form and relationships between its physical components.	2	U, E, R, An
			CO2: Understand the human landscape and integrated and interdisciplinary nature of human geography.	2, 5	U, C, R, An
			CO3: Evaluate the interrelationship phenomena between humans and the surrounding environment by referring to various scholars of the discipline.	2, 4, 5	U, C, E
			CO4: Comprehend and assess the knowledge of early human society, cultures, and behavior in the context of spatial distribution pattern.	5	C, U, E, An
I	HAGE103	Paper III - Economic Geography	CO1: Gain knowledge and understand the distribution of various types of economic activities in coexistence with the available resources and linkages.	2	U, R
			CO2: Discuss the resource availability, distribution, and movement as a driving force for industrial location decisions over space in time.	2, 5	U, C, R, A
			CO3: Evaluate the role of factors in the agglomeration and concentration of industries in a region.	2, 4, 5	U, C, E
			CO4: Apply the different models and assess the industrial dynamics.	5	C, U, E, An

I	HAGE104	Paper IV - Geography of Rajasthan-I (Physical and Cultural Aspects)	CO1: Learn the geographical features, climate, water, soil, human resources, and other significant regional features of Rajasthan.	2	U, R
			CO2: Examine the comprehensive overview of economic and socio-cultural features of arid and semi-arid regions.	2, 5	U, C, R, A
			CO3: Gain essential knowledge about Rajasthan, which will prove beneficial for state-level and other competitive exams, helping them familiarize themselves with the state's fundamental information.	2, 4, 5	U, C, E
			CO4: Evaluate the resource development prospects for regional development and planning in the future.	5	C, U, E, An
I	HAGE151	Practical	CO1: Learn the art of making Maps.	2,3,5	U, C,An, A
			CO2: Calculate the distances on the Map by knowing about the different types of the scale.	2, 4, 5	U, C, E
			CO3: Learn the Methods of depiction of the relief.	2, 4, 5	U, C, E
			CO4: Evaluate the data of climate on the Map.	2, 4, 5	U, C, E
II	HAGE201	Paper I - Physical Geography – II (Climatology & Oceanography)	CO1: Differentiate between air and wind, weather and climate, local wind and planetary wind, elements of weather.	2	U, R, E
			CO2: Evaluate the world climate and climatic classification based on climatic factors.	2, 5	U, C, R, A
			CO3: Study chemical and physical properties of oceans, oceanic circulation, oceanic currents, marine resources.	2, 4, 5	U, C, E
			CO4: Unravel the ocean ecosystems and deep-sea resources.	5	C, U, E, An
II	HAGE202	Paper II - Human Geography – II	CO1: Study the human and environment Interrelation.	2	U, C, E
			CO2: Get a visionary idea of structure of house types, appearance, qualities of the structure and available raw materials as building materials.	2, 5	U, C, R, A
			CO3: Analyze the transport network connectivity and accessibility.	2, 4, 5	U, C, E
			CO4: Understand the pattern of urbanization, movement, and agglomeration in urban areas.	5	C, U, E, An

II	HAGE203	Paper III - Theories of Economic Geography	CO1: Learn and analyze the spatial structure of economic activities across the globe.	1, 5	R, U, An
			CO2: Study the methodological approaches of economists to understand the spatial pattern and distribution of economic activities.	1, 2, 3, 5	R, U, An, A, C
			CO3: Analyze the locational benefits, locational quotient, agglomeration economies of major industries of the world.	4, 5	An, A, C
			CO4: Evaluate the regionalization pattern of India of regional industries.	4, 5	U, An, A
II	HAGE204	Paper IV - Geography of Rajasthan - II (Economic Aspects)	CO1: Learn about the economy of resources availability in the state.	1, 2	U, R
			CO2: Describe the various institutional reforms to enhance the economic status of the region.	1, 2	R, U, A
			CO3: Evaluate the economic viability of major crops and cropland use pattern in arid and semi-arid regions.	4, 5	An, C
			CO4: Analyze the industrial economic activities.	1, 4	A, C
II	HAGE251	Practical	CO1: Read and interpret the weather Maps.	2,3,5	U, C,An, A
			CO2: Learn to draw isotherm and isobar maps.	1, 2	R, U, A
			CO3: Sketch the land use Maps by using different methods of surveying.	4, 5	An, C
			CO4: Create a plan for a small area.	1, 2	R, U, A
			CO5: Read and interpret the weather Maps.	4, 5	An, C
III	HAGE302	Paper II - Cultural Geography-I	CO1: Examines patio-temporal features of cultural regions.	1, 3	U
			CO2: Learn about the cultural landscape, cultural diffusion, cultural interaction, and cultural integration across the globe.	3, 4, 5	R, U, A, E
			CO3: Study the civilization, its development and spread in the world.	3, 5	U
			CO4: Study the civilization, its development and spread in India.	1, 3	U, R

III	HAGE303	Paper III - Fundamentals of Biogeography-I	CO1: Learn about the minerals and energy flow in the environment and general circulation of nutrients.	1, 5	U, R, E
			CO2: Study the natural habitat – Biome and community.	1, 4, 5	U
			CO3: Evaluate the process of distribution, origin, and spread of biological diversity.	1, 2, 4, 5	U, A, E
III	HAGE304	Paper IV - Statistical Methods in Geography-I	CO4: Study the patterns of geographic distribution of organisms and the factors that determine those patterns.	1, 5	U, E
			CO1: Learn whether actual pattern matches an expected or theoretical one.	4, 5	E, A
			CO2: Describe, summarize, and evaluate the spatial data.	4	E, An, A, C
			CO3: Evaluate general pattern and trend in the given dataset.	4	C, E, A
			CO4: Analyze the reasons of variability of data at a particular place thus proving the extra dimension of location to statistics.	1, 4, 5	C, E, An, A
III	HAGE351	PRACTICAL	CO1: Represent data using different types of diagrams.	2,3,5	U, C,An, A
			CO2: Acquire knowledge of different types of maps and cartography techniques to represent the data.	4, 5	E, A
			CO3: Apply statistical techniques to the data for further analysis.	4	E, An, A, C
			CO4: Learn the basic concepts of applying statistical tools in geographical analysis.	4	C, E, A
			CO1: Represent data using different types of diagrams.	1, 4, 5	C, E, An, A
IV	HAGE401	Paper I - Political Geography	CO1: Gain insight into changing themes, approaches, and methodological developments in political geographies.	3, 4	U, A
			CO2: Critically analyze the system of government and institutional mechanisms.	3, 4	E, An
			CO3: Evaluate the functioning and cooperation between international economic organizations.	4, 5	E, An, C
			CO4: Analyze new economic order and geopolitical dimensions.	3, 4	E, An, A, C

IV	HAGE402	Paper II - Cultural Geography-II	CO1: Learn about different languages, religions, ethnicity, races, technology advancements, and social change.	1, 3	U, R
			CO2: Evaluate environmental and cultural variables and correlation between them.	4, 5	E, C, A
			CO3: Develop models and theories on the concept of changing paradigm shift in socio-cultural processes with modern time over the space.	3, 4	E, An, C, A
			CO4: Understand the geo-political economic order and geopolitical considerations.	3	U, A
IV	HAGE403	Paper III - Fundamentals of Biogeography-II	CO1: Get in-depth knowledge of the ecosystem in general and ecotone, biomes, community, and succession in specific.	1, 2, 4, 5	U, An
			CO2: Correlate the relationship between environment and zoogeographical regions and phytoplankton regions.	4, 5	U, R, An, A
			CO3: Examine habitat of plants and animals through geological time scale.	2, 4, 5	U, R, An
			CO4: Inspect the human processes and dynamism of ecosystem.	5	U, An
IV	HAGE404	Paper IV - Statistical Methods in Geography-II	CO1: Learn the qualitative and quantitative techniques of research methodology.	4, 5	U, An, C
			CO2: Calculate the variability and variance by using techniques of statistics.	4	U, An, E, C
			CO3: Evaluate the result and describe the phenomena and pattern.	4, 5	E, C
			CO4: Apply the statistical tools in the research methodology of spatial analysis.	4	E, An, C
IV	HAGE451	Practical	CO1: Learn surveying techniques with different methods and instruments	2, 3,5	U, C,An, A
			CO2: Get acquainted with the smaller Geographical units.	4, 5	U, An, C
			CO3: Write a report of survey data	4	U, An, E, C
			CO4: Prepare a minor project	4, 5	E, C

V	HAGE501	Paper I - India: A Systematic Geography-I	CO1: Find out the physiographic features of India and its significance in locational context.	1, 2, 5	U, R, An
			CO2: Examine the natural resources and spatial distribution patterns.	1, 2	U, R, An
			CO3: Assess the development based on resources availability and utilization.	1, 2, 5	U, R, An, C
			CO4: Study the dynamism in demographic profile and evaluate its processes, impact, and evolution of spatial changes.	1, 2, 4	U, R, An, C, A
V	HAGE502	Paper II - Evolution of Geographical Thought-I	CO1: Get insights into interactive phenomena between human and environment throughout history.	1, 2	U
			CO2: Understand the cultural landscape tradition evolved from early forms of environmental determinism and possibilism, which further transitioned into traditional regional geography.	2, 3, 5	U, R, An, A, C
			CO3: Gain knowledge about physical theories, human behavioral theories, and combinational theories.	2, 4	E, An, C
			CO4: Learn main approaches to geographical studies.	2, 4, 5	U, An
V	HAGE503	Paper III - Agricultural Geography – An Introduction	CO1: Understand the social polarization and agricultural effect on the environment.	1, 2	U, An
			CO2: Gain knowledge of the complex system of environment, biology, economics, and technology.	1, 2, 4, 5	U, An, C
			CO3: Learn about sustainable farming practices while reducing the environmental footprint.	1, 2, 3, 5	R, U, E, An, A
			CO4: Classify agricultural activity over space in time and also the types of farming based on geographical conditions and technology.	1, 2, 5	An
V	HAGE504	Paper IV - Applied Geography-I	CO1: Learn the resolution to problems that have spatial dimension by using a variety of geographic tools.	4	U, C
			CO2: Understand the relevance and value of socially relevant approaches to study the relationship between people and their environment.	3, 4, 5	U, An, A
			CO3: Evaluate the natural disasters prediction to implement policy and mitigation techniques.	4	U, An, A, E
			CO4: Get acquainted with the applicability of practical tools like remote sensing, GIS, and statistical analysis.	3, 4	U, An, A, C

V	HAGE551	Practical	CO1: Get the knowledge of the co-ordinate system and its applicability	2,3,5	U, C,An, A
			CO2: Learn to prepare the grids pattern for various regions of the world	4, 5	U, An, C
			CO3: Select appropriate maps for specific purpose	4	U, An, E, C
			CO4:Prepare map according to the region or purpose	4, 5	E, C
VI	HAGE601	Paper I - India: A Systematic Geography-II	CO1: Understand the spatial location analysis.	2	U, R
			CO2: Evaluate the implications of location choices for the distribution of wealth and income.	1, 2	U, R, E, An
			CO3: Describe various approaches to the location of industries and develop theories and models.	1, 2, 3, 5	U, R, E, An, C
			CO4: Make rational decisions about economic production economies and linkages analysis.	4, 5	U, R, E, An, C
VI	HAGE602	Paper II - Evolution of Geographical Thought-II	CO1: Analyze the chronological evolution of the concept of geography and comprehend knowledge in exploring the earth's surface and its processes.	3, 5	U
			CO2: Understand human behavior and the surrounding physical environment and its modifications.	3, 5	U, R, An
			CO3: Undertake further research using empirical and descriptive research techniques in geography.	3, 4, 5	U, R, An
			CO4: Tackle virtually any philosophical theme in contemporary geographical thought.		U, An
VI	HAGE603	Paper III - Field Work and Research Methodology	CO1: Train in fieldwork exercises.	4	An, A
			CO2: Relate the spatial pattern of distribution of agricultural activities and generated economies with pre-existing models and theories.	3, 4, 5	U, An, A, E
			CO3: Learn methods and techniques of delineating agricultural regions and regionalization.	4	U, E, C, An
			CO4: Analyze food security and sustainability issues and policies.	3, 5	An, A
VI	HAGE604	Paper IV - Applied Geography-II	CO1: Evaluate the principles of land use classification by using statistical tools and techniques.	4, 5	U, E, An
			CO2: Formulate models and theories of spatial orientation of human activity in immediate surroundings.	4	U, E, An, C

			CO3: Review existing sustainability policies and frame new ones according to societal dynamism.	1, 4	U, E, An
			CO4: Draft a plan for future growth and development of economic, social, and cultural activities.	3, 4, 5	U, E, An, C
VI	HAGE651	PRACTICAL	CO1: Learn surveying techniques with different methods and instruments.	2,3,5	U, C, An, A
			CO2: Interpret cultural and physical landscape.	2,3,5	U, C, An, A
			CO3: Get the knowledge of basic principles of Remote sensing.	3, 4, 5	U, E, An, C
			CO4: Collect data with the help of GPS and can interpret the Landsat images with GIS Tool.	3, 4, 5	U, E, An, C

History (Hons.) (PSO's)

PSO1	Create Original research questions or hypotheses that contribute to advancing knowledge in the field of Indian history.
PSO2	Evaluate the contributions and limitations of different historical theories and perspectives to the understanding of Indian history.
PSO3	Identify and analyze patterns, trends, and contradictions within Indian historical narratives and historiography.
PSO4	Apply historical knowledge to contemporary issues or interdisciplinary contexts related to Indian society and culture.
PSO5	Understand the inter connections between various historical phenomena and their implications for Indian society.
PSO6	Remember and identify significant historical events, figures, dates, and periods in Indian history.

Semester	Course Code	Course Title	Course Outcomes		
				PSOs Addressed	Cognitive Levels
I	HAHS101	Paper I - Sources of Indian History - Part-I	CO1: Gain a comprehensive understanding of various types of historical sources used by historians to study Indian history.	5, 2	U, E
			CO2: Evaluate primary sources (documents, artefacts, inscriptions, etc.) and secondary sources (books, articles, commentaries) and their significance.	5, 2	U, E
I	HAHS102	Paper II - History of India (From Beginning to 1200 A.D.) - Part-I	CO1: Understand the nature, scope, and significance of history, Iron Age in India, prehistoric cultures, Aryans in India, and the foundation of the Mauryan Empire.	5, 3	U, An
			CO2: Analyze the importance of Ancient India's past.	5, 3	U, An
I	HAHS103	Paper III - History of Rajasthan (From Earliest Times to 1956 A.D.) - Part-I	CO1: Demonstrate and understand broad academic knowledge of the history of Rajasthan.	5, 3	U, An
			CO2: Analyze the importance and study of Rajasthan history.	5, 3	U, An
I	HAHS104	Paper IV - Ancient Indian Art and Architecture - Part -I	CO1: Interpret the symbolism and meaning behind ancient Indian artistic motifs and architectural elements.	5,2	U,E
			CO2: Assess the impact of ancient Indian artistic achievements on subsequent Periods and civilizations.		
II	HAHS201	Paper I - Sources of Indian History: Part - II	CO1: Understand broad knowledge of sources of History of Delhi Sultanate along with traveler's accounts and archival sources.	5, 6	U, R
			CO2: Remember the Ancient History.	5, 6	U, R
II	HAHS202	Paper II - History of India (From Beginning to 1200 A.D.) - Part-II	CO1: Understand the political history of Ancient India with special context to Gupta Empire, their social, economic, cultural, and administrative setup, covering period from 750-1200 A.D.	5, 6	U, R
			CO2: Remember the facts of Gupta Empire and Post-Gupta political setup.	5, 6	U, R

II	HAHS203	Paper III - History of Rajasthan (From Earliest Times to 1956 A.D.): Part-II	CO1: Understand the complete history of Modern Rajasthan from 1818 till Independence.	5, 3	U, An
			CO2: Analyze the rise and transition to state formation in Rajasthan, discuss the development of various spiritual, literary, and urban phenomena.	5, 3	U, An
II	HAHS204	Paper IV - Ancient Indian Art and Architecture: Part-II	CO1: Synthesize knowledge of ancient Indian art and architecture to propose hypothetical reconstructions of ancient monuments or artefact's.	1, 5	C, U
III	HAHS301	Paper I - Historians of Medieval India: Part-I	CO1: Understand broad academic knowledge of historiography of Medieval Indian History.	5, 6	U, R
			CO2: Remember the writings of medieval historians.	5, 6	U, R
III	HAHS302	Paper II - History of Medieval India (1200-1526): Part-I	CO1: Understand sources and historiography of Medieval Indian History.	5, 2	U, E
			CO2: Evaluate the causes of Muslim invasions and the role of different Muslim dynasties, their society, administration, culture, and economy.	5, 2	U, E
IV	HAHS401	Paper I - Historians of Medieval India: Part-II	CO1: Understand medieval historical writings.	5, 3	U, An
			CO2: Analyze historiography of the Mughal period.	5, 3	U, An
IV	HAHS402	Paper II - History of Medieval India (1526:1761 A.D.): Part-II	CO1: Understand sources and historiography of the Mughal period, Mughal policy towards different kingdoms, their society, culture, and administration.	5, 2	U, E
			CO2: Examine and evaluate the differences in administration of different dynasties.	5, 2	U, E
IV	HAHS403	Paper III - Main Trends in the Cultural History of India: Part-II	CO1: Understand the heritage and culture of India.	5	U
			CO2: Understand Hindu temple styles, Mughal architecture, music, dramas, and ancient Indian scientific traditions.	5	U
IV	HAHS404	Paper IV - Art and Architecture of Medieval India: Part-II	CO1: Memorize significant architectural styles, such as Indo-Islamic, Dravidian, and Nagara.	5, 3	R, A
			CO2: Apply knowledge of medieval Indian art and architecture to identify specific monuments or artworks.	5, 3	R, A

V	HAHS501	Paper I - History of Modern India (1761:1971): Part-I	CO1: Understand modern Indian history, importance of sources in the study of modern India, expansion and consolidation, impact.	5, 3	U, An
V	HAHS502	Paper II - History of Modern World Up to Second World War: Part-I	CO1: Understand the relation between modernity and nationalism and its implications.	5, 3	U, An
			CO2: Analyze the process of colonialism in different parts of the world, national unification of Germany and Italy.	5, 3	U, An
V	HAHS503	Paper III - Administrative and Constitutional History of Modern India: Part-I	CO1: Understand the historical context of modern India, including key events, social structures, and economic developments from the 18th century to the present.	5, 3	U, An
			CO2: Explain and analyze the historical context.	5, 3	U, An
V	HAHS504	Paper IV - Modern Indian Thought: Part-I	CO1: Assess the relevance of modern Indian philosophical ideas in today's globalized world.	5, 3	E, A
			CO2: Apply principles of modern Indian thought to analyze contemporary issues.	5, 3	E, A
VI	HAHS601	Paper I - History of Modern India (1761:1971): Part-II	CO1: Identify major events of history and personalities while assessing its relevance in Indian as well as world history.	5, 3	U, An
VI	HAHS602	Paper II - History of Modern World Up to Second World War: Part-II	CO1: Gain deeper knowledge of world wars and their impact on other countries.	5, 3	U, An
			CO2: Analyze the Russian Revolution of 1917 and the formation of the UNO.	5, 3	U, An
VI	HAHS603	Paper III - Administrative and Constitutional History of Modern India: Part-II	CO1: Equip students with a deep understanding of the administrative and constitutional history of modern India, fostering an appreciation of how historical events have shaped the nation's governance structures and policies.	5	U
VI	HAHS604	Paper IV - Modern Indian Thought: Part-II	CO1: Recall major figures and movements in modern Indian thought.	5, 2	R, An, C
			CO2: Examine the historical and cultural contexts that influenced modern Indian thinkers and synthesize ideas from different modern Indian philosophical traditions to develop original perspectives.	5, 2	R, An, C