



# CH. BANSI LAL GOVERNMENT COLLEGE FOR WOMEN

Tosham (Bhiwani)

Affiliated to CBLU Bhiwani Recognised u/s 2(f) of UGC Act

Ph. : 01253-297062

AISHE Code : C-28470

E-mail : chbansilalgcwtosham@gmail.com

Ref. No. ....

Dated .....

## Program Outcomes

### **Program Outcomes of Bachelor of Arts (B.A.) Pass-course**

Student seeking admission for B.A. programme is expected to imbue with following quality which helps them in their future life to achieve the expected goals.

- PO 1. The students acquire knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible enough.
- PO 2. The B.A. graduates will be acquainted with the social, economic, historical, geographical, political, ideological and philosophical tradition and thinking.
- PO 3. The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice.
- PO 4. The B. A. program enables the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.
- PO 5. The students will be ignited enough to think and act over for the solution of various issues prevailed in the human life to make this world better than ever.
- PO 6. Programme provides the base to be the Critical temper, Creative ability, Realization of human values, Sense of social service responsible and dutiful citizen.

### **Program Outcomes of Bachelor of Commerce (B.Com.) Pass-course**

- PO 1. The B. Com. Graduates would be able to acquire basic and fundamental knowledge and skills for doing business and commercial activities of their choice.
- PO 2. The program also empowers the graduates to appear for various competitive exams or choose a profession of their choice such as CA, CS, ICWA, MBA, M.Com etc.
- PO 3. The program enables the students to acquire the accounting knowledge, management principles, retail trading, banking and insurance transactions, business economics and financial management.
- PO 4. The students also acquire knowledge in the field of management accounting, corporate accounting, statistical and mathematical techniques and knowledge relating to corporate law and business laws.
- PO 5. The students become capable of doing a business of their choice or choosing a profession or can become employees having basic knowledge and skill required for such activities.
- . The students also acquire the knowledge and skills of taxation laws by which they can start the business of filling Income tax and GST returns.

### **Program Outcomes of Bachelor of Science (B.Sc.) Pass-course**

- PO 1. The B. Sc. Programme develops scientific temperament and attitude among the science graduates.
- PO 2. The qualities of a science – observation, precision, analytical mind, logical thinking, clarity of thought and expression, systematic approach, qualitative and quantitative decision making are enlarged.
- PO 3. The program also empowers the graduates to appear for various competitive examinations or choose the



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post graduate programme of their choice.

- PO 4. This programme trains the learners to extract information, formulate and solve problems in a systematic and logical manner.
- PO 5. This programme enables the learners to perform the jobs in diverse fields such as science, engineering, industries, survey, education, banking, development-planning, business, public service, self-business etc. efficiently.

## **Program Outcomes of Post graduate programme in Geography:**

**Students are able to:**

- **PSO1:** Understand not only the place where they live in but also about the lives of people living in other areas of the interconnected world. It also enhances understanding of the relationship between the global and the local level and the outcomes of these relationships (relationship between global processes and their local manifestations).
- **PSO2:** Have deep knowledge about places, regions and spatial relationship as result of series of inter-related factors of nature, culture and individual human actions.
- **PSO3:** Make the social and cultural differences (race, ethnicity, gender, age, class) their geographical embeddedness.
- **PSO4:** Sensitise the need to conserve environment, resources in order to have a more sustainable earth.
- **PSO5:** Have the theoretical knowledge with local realities by making field visits to different areas.
- **PSO6:** Use and map the digital spatial data in more rational way.
- **PSO7:** Understand the paradigm shifts all along with the process of historical development of geography as a subject of learning.



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## Course Outcomes (COs)

### B.A. Course Outcomes (COs)

#### **B.A. English Compulsory**

- B.A. English (SEM-1) C.O. 1:- Essays- Contain inspirational Contents about various mythological and scientific concepts about origin of universe, culture, scientific development and moral ethical learning and offer scope for effective spoken and writing skills.
- B.A. English (SEM-2) C.O.2:- Stories- offer interaction with life in various phases and cultural and economic backgrounds and scope for grammar learning and application for developing effective writing ability.
- B.A. English (SEM-3) C.O.3:- „Poetry“ offers interaction to forms of Poetry, stanza forms and various poetic styles and offers ample scope in building up aesthetic rhyming skills and communication skills.
- B.A. English (SEM-4) C.O.4:- One Act plays offer glimpse of life and render effective training in coping up with precarious situations in life.
- B.A. English (SEM-5) C.O.5:- Fiction has the novel Kanthapura in the syllabus which offers interaction to Indian writing in English and India’s political, economic and social history in pre-independence times and role of Gandhian ideology and awakening in tackling exploitation of colonial rulers.
- B.A. English (SEM-6) C.O. -6:- Drama has „The Merchant of Venice“ in the syllabus and it sensitizes the students regarding prevailing religious conflicts and promoting sense of sacrifice for promoting friendship and fighting inhumanity and cruelty.



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## BA HINDI (COMPULSARY)

| CLASS (कक्षा)                    | COURSE(पाठ्यक्रम)                                                                                                       | OUTCOMES (Students will able to) शिक्षण के उद्देश्य                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| बीए प्रथम वर्ष प्रथम सेमेस्टर    | 1. मध्यकालीन काव्य कुंज<br>2. हिंदी साहित्य के इतिहास का आदिकाल<br>3. काव्य के तत्व और विविध रस                         | हिंदी साहित्य के इतिहास के आदिकाल, भक्तिकाल और रीतिकाल की सामाजिक, आर्थिक, सांस्कृतिक और राजनीतिक परिस्थितियों के संदर्भ में साहित्य को समझना।<br>कबीर दास, सूरदास, तुलसीदास आदि संत व भक्त कवियों की कविताओं का अध्ययन करना।                                                                                                                                                                        |
| बीए प्रथम वर्ष द्वितीय सेमेस्टर  | 1. ध्रुवस्वामिनी नाटक<br>2. हिंदी साहित्य के इतिहास का भक्ति काल<br>3. व्यावहारिक हिंदी में भाषा का स्वरूप              | रीतिकाल के आधार को समझने के लिए रीतिबद्ध, रीतिसिद्ध और रीति मुक्त धारा के संपूर्ण साहित्य और उसकी विशेषताओं को समझना।<br>विद्यार्थी हिंदी के प्रख्यात कवियों और साहित्यकारों की बहुमुखी प्रतिभा से परिचित हो सकेंगे। विद्यार्थियों में भाषा और साहित्य समझ और हिंदी भाषा और साहित्य के प्रति अभिरुचि का विकास करना।                                                                                  |
| बीए द्वितीय वर्ष तृतीय सेमेस्टर  | 1. आधुनिक हिंदी कविता<br>2. हिंदी साहित्य के इतिहास का रीतिकाल<br>3. प्रयोजनमूलक हिंदी कंप्यूटिंग व अनुवाद              | प्रख्यात हिंदी कथाकारों की उनकी कहानियों के माध्यम से साहित्यिक योगदान के साथ साथ जीवन-दर्शन को समझना।<br>कक्षा में सार्थक ढंग से साहित्य की चर्चा करते हुए विद्यार्थियों को भाषा में अर्थ-ग्रहण की प्रक्रिया के बारे में सजग और जिज्ञासु बनाना।<br>विद्यार्थियों में मानवीय गुणों का विकास करना, मानसिक क्षमता, क्रियाशीलता, संवेदनशीलता का विकास करना                                              |
| बीए द्वितीय वर्ष चतुर्थ सेमेस्टर | 1. कथाक्रम<br>2. हिंदी साहित्य आधुनिक गद्य काल<br>3. पारिभाषिक शब्दावली                                                 | विद्यार्थियों में निष्पक्ष रूप से सोचने समस्याओं और स्थितियों को एक खुले दृष्टिकोण के साथ समझने की क्षमता, तार्किक और विश्लेषणात्मक कौशल को विकसित करना विद्यार्थियों को प्राप्त सैद्धांतिक ज्ञान को व्यावहारिक रूप से प्रयोग करने के लिए अभिप्रेरित करना                                                                                                                                            |
| बीए तृतीय वर्ष पंचम सेमेस्टर     | 1. समकालीन हिंदी कविता<br>2. हिंदी साहित्य के इतिहास का आधुनिक काल<br>3. प्रयोजनमूलक हिंदी पत्र-लेखन, संक्षेपण व पल्लवन | विद्यार्थियों को वातावरण के प्रति समायोजन की क्षमता प्रदान करना, सृजनात्मक क्षमता का विकास करना और सृजनात्मक कार्य के लिए प्रेरित करना छात्रों को ध्वनियों, ध्वनियों में सूक्ष्म अंतर, शब्द- योजना, शब्द शक्तियों और शुद्ध वर्तनी का ज्ञान कराना।<br>शब्द- शक्ति, लोकोक्ति, मुहावरे आदि का प्रसंगानुकूल अर्थ निकालना और स्वराघात एवं बलाघात के अनुसार अर्थबोध ग्रहण करने में योग्य बनाना।            |
| बीए तृतीय वर्ष षष्ठम सेमेस्टर    | 1. नव्यतर गद्य गौरव<br>2. हरियाणवी भाषा और साहित्य का इतिहास<br>3. प्रयोजनमूलक हिंदी पत्रकारिता                         | प्रयोजनमूलक हिंदी के अर्थ, अवधारणा, महत्व और विभिन्न रूपों को समझने में सक्षम बनाना अनुवाद के महत्व और जनसंचार के माध्यमों से लेखन के विभिन्न रूपों का ज्ञान कराना। हरियाणवी साहित्य की विभिन्न विधाओं में विद्यार्थी परिचित हो सकेंगे। विद्यार्थियों को आदर्श पत्र लेखन तकनीक का पत्रों में विविध प्रकारों का ज्ञान कराना। विद्यार्थी वर्ग में नैतिक और आदर्श मूल्य जीवन मूल्यों का विकास हो सकेगा। |



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## **B.A. /B.Sc. Sanskrit**

### **B.A. 1st Year (First Semester)**

#### 1. "Sanskrit Vakavayvahar"-

- Through this students will be able to converse in Sanskrit.
- It is useful dialogue in folk behavior.
- They will get the knowledge of vocabulary of the society.
- They will be able to talks with each other, with parents and teachers.

#### 2. "Hitopadesh"-

- Retarded child will be able to gain knowledge about policies.
- Moral and religious teachings will give them an opportunity to be wise.
- Students will be intermingled with each other by reading the stories and can do even more and more difficult things together.
- They would not be collecting more money.

### **B.A.1st Year (2nd Semester)**

#### 1. „Anuvaad“-

- It is helpful to write letter in Sanskrit.
- It is helpful to speak in Sanskrit.
- Through translation students will be able to write in Sanskrit language and learn to pronounce pour.
- They will talk to each other in Sanskrit language.

#### 2. "Kanthasth Sloke"-

- Through memories verses students would be able to acquire knowledge Sanskrit language.

#### 3."Dutyakayam"-

- Through this play the students will be known about the impressive personality of Shri Krishna.
- They will be able to process similar qualities in their life.
- They will not play gaming games.

#### 4. ""Shuknasopdesh"-

- Through this prose the students will come to know about the character of Candrapid.
- They would be able to know about the playful nature of Lakshmi.
- They would be able to hold up the guru"s sermons in their life.
- Reading this play, they would give up the life of luxury.

#### 5."Chand"-

- The students will be able singing with rhythm.
- They will know about the number of alphabets in verse.
- They will have knowledge of mantras.



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## B.A. 2nd Year (3rd Semester)

### 1. "Ramayana"-

- Students will be able to know about first Kavya and first poet.
- They will acquire as innocent and spotless character as Rama.
- They will be able to become obedient son and brotherhood like Rama.
- The personality will be getting the qualities of truthfulness, protector of religion, firm pledge and philanthropist like Rama.

## B.A. 2nd Year (4th Semester)

### 1. "Shrimad Bhagvatgita"

- Through this the students will be able to get information about their culture, religion, karma yoga, atma and sthiti/pragya.

### 2. "Raguvansham"-

- Through this epic students will be able to know about kings of Ikshavaku dynasty especially Dilip, Raghu, Dasaratha and Ram's character.
- They will try to attain humility, dignity and duty according to them.
- They will also know the importance of "Gau-service".

### 3. Patar-lekhan-

- Students have learnt to write letters in Sanskrit language.
- Through this their grip will become strong on the Sanskrit language.

### 4. Smaas-

- Students will learn to brief the long posts.

### 5. Karidant partys-

- Students will learn to give new meaning to manage associations.

### 6. Partyahaar-

- Through this the students will learn to tame the senses.

## B.Sc. 2nd Year (3rd Semester)

### 1. "Isastav"-

- Through this lesson students will be able to know many forms of god such as the eternal, omnipresent, animate.
- Their spiritual wisdom will be increased.
- Positive ideology will develop in students.
- They would be able to avoid sin karma, irreligious works.

"Sadhuvartam"-



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- Through this verse students will be able to assume similar qualities as gentlemen.
- “Dhik Daridaryam”-
- Through this lesson they will be able to get information about the importance of wealth.
- “Darmjyo Rama”-
- This lesson will enable the students to become an ideal, dutiful, conscientious, obedient, theologian, virtuous like Rama.

## 2. ”Anushasnam”-

- Through this lesson students will be able to learn to speak the truth, to follow the religion, to study and to respect their parents and teachers.
- They will be able to do all the work of their daily life and assume the matter of virtue.
- They will know that „who possesses wisdom has the power”. Brainless have no power.
- They will be able to learn that by abandoning one’s family and one’s caste people, one should not make others his own, otherwise there be death.

## 3. Shabad rupe-

- Through word forms, students will be able to acquire the knowledge of declension and word of honor.

## 4. Dhatu rupe-

- Through metal from students will be able to know about derivation of words and about person.

## 5. Sandhi-

- Students will learn how to match and divide words through sandhi.

## 6. Anuvaad-

- Through translation students will be able to write the Sanskrit language and learn to pronounce pour.

### **B.Sc 4th Sem Sanskrit**

#### 1. Padhay Bhag-

- Through “Dandh-sasti parja sarva” poem students will be able to get information about the importance of punishment.
- They will not do sinful act by the fear of punishment. The learn to obey their parents and teachers.
- Through “Sithith Pragma” poem the students will learn to concentrate their mind and intellect, to put restraint on the senses, to avoid anger and to avoid infatuation.
- Students will be able to accept the Teaching and policies conveyed by Chanakya.



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2. Gadhay Bhag-

- Through “Nasishayaopdisayate” lesson the students will be able to know that man should not preach unreachable and unfamiliar person. A bad company is one that gives fear, so they will not befriend durge persons. They would have not discussion about the act of other and focus on our work.
- They will learn by “Sundopsund” story that the war is always losing. They will be able to learn to act together.

**B.A. /B.Sc. Mathematics**

**B.Sc.-1/B.A.-1 (Semester-1)**

- **CO -1: Algebra:**
- Work with matrices and determine if a given square matrix is invertible, system of equations, eigen values and eigen vector.
- Algebra is faster and basic maths.
- It reinforces logical thinking and may be a job skill later.
- **CO-2: Calculus:**
- Calculus the language of motion and change.
- It is used in analysing a system.
- Find an optional solution.
- Calculate definite integrals that may involve logarithms, exponentials, polynomials and powers by using fundamental theorems of calculus.
- This paper deals with asymptotes, curve tracing and quadrature.
- **CO-3: Solid Geometry:**
- To Study the application of 3D figure.
- To get Basic Knowledge about cone, parabola, hyperbola, ellipse etc.
- It is useful for vision.
- It leads to simpler computation of connectivity, within and between objects, and can be implemented more readily on a parallel architecture.
- **B.Sc.-1/B.A.-1(Semester-II)**
- **CO-1: Number Theory and Trigonometry:**
- Define and interpret the concepts of divisibility, congruence, greatest common divisor, prime factorization.
- Number theory is famous for generating easy-to-ask, hard-to-answer questions and that is one reason for its popularity.
- Nurture problem solving skills, thinking and creativity.
- **CO-2: Ordinary Differential Equations:**
- Evaluate first order differential equations including separable, homogeneous, exact and linear.



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- Create and analyse mathematical models using higher order differential equations to solve application problems.
- Recognise ODE's and System of ODE's concepts that are encountered in the real world, understand and be able to communicate underlying mathematics involved to help another person gain insight into the situation.
- **CO-3: Vector Calculus:**
- Calculate line integrals along path, fundamental theorem of line integrals, Green's theorems, Stokes theorems and divergence theorems.
- Vector calculus is concerned with differentiation and integration of vector field.
- It is used extensively in physics and engineering, especially in the description of electromagnetic fields and fluid flow.

## B.Sc. II/B.A. II (Semester III)

- **CO-01: Advanced Calculus:**
- Continuity, uniform continuity and mean value theorems of function of one variable.
- Limit, continuity and Differentiability of function of more than one variable i.e. function of several variables.
- Parabolic function, Hyperbolic function in curve in space.
- **CO-02: Partial Differential Equation:**
- Basic Concepts of PDE, Solution of some special type of PDE.
- General and particular solution of PDE
- Heat, Wave and Laplace equation and solution of PDE.
- **CO-03: Statics:**
- Develop an understanding of how a machine applies force to work against load force.
- It is used to produce a conceptual link between the „macroscopic view“ and the „microscopic view“.
- This approach produces some useful insights and applications in many fields of virtual work, null lines, and wrenches.

## B.Sc. II/B.A. II (Semester IV)

- **CO-1: Programming in C and Numerical Methods:**
- This book is aimed at advancing concepts of programming and software code organization within the framework of structural and procedural programming paradigms.
- Understanding a functional hierarchical code organization.
- Ability to define and manage data structure based on problems subject domain.
- Student can understand defensive programming concepts. They can handle possible errors during program execution.
- **CO-2: Sequence and Series:**
- This paper defines sequence and series and also identifying the different kind of



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sequence and series, common ratio of geometric sequence, A.M., G.M., H.M.,  
Sum of infinite series.

- Student can learn to work with logarithm, exponential and inverse trigonometric functions.
- They are able to find partial sum of an infinite series.
- **CO-3: Special Functions and Integral Transforms:**
- This book cover topics such as power series, Bessel's equation and function, Legendre's equation, Hermit equation, Laplace transformations, Fourier transformations.
- Students can understand integral calculus and special function of various engineering problem and to know the application of some basic mathematical method via all these special functions.
- They can able to explain the application and the usefulness of these special functions

## B. Sc.III/ B.A. III (Semester-V)

- **CO-1: Real Analysis:**
- This paper define and recognise the basic properties of the field of real numbers, the series of real numbers and convergence, Bolzano-weirstrass theorem, basic topological properties of  $\mathbb{R}$ .
- It can improve and outline the logical thinking of students.
- Students are able to apply the theorem in correct way.
- Students can interpret how to know the real functions continuity and differentiability and their related problems based on their theorem's results.
- **CO-2: Group And Rings:**
- This paper covers topics such as: abelian groups, cyclic groups, permutations, cosets, rings, integral domain, ideals, modulus, polynomials rings, and field.
- Students will be able to perform basic computations in group and ring theory.
- Students will become familiar with some application of abstract algebra which is useful for developing error correcting codes, encryption, and prediction of 3D structures.
- **CO-3: Numerical Analysis:**
- Students will able to solve the probability based problems
- Students derive numerical methods for various mathematical operation and tasks, such as differentiation, integration. The solution of linear and nonlinear equation and solutions of differential equations.
- Students will solve the interpolation and exploration based problems.
- This course will develop an understanding of error analysis for numerical methods.



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**BSc.III/ B.A. III (Semester-VI)**

- **CO-1: Real And Complex Analysis:**
- This book contains topic such as: Jacobians, Beta and gamma functions, Double and triple integrals, Fourier series, and calculus of complex functions.
- Students can understand how complex numbers provide a satisfying extension of the real numbers.
- Students can solve problems involving convolution, filtering, modulation and sampling.
- Students can learn techniques of complex analysis that make practical problems easy (e.g. graphical rotation and scaling as an example of complex multiplication).
- **CO-2 : Linear Algebra:**
- This book covers topic such as: vector spaces and subspaces, basis and dimension, quotient space, linear transformation, rank and nullity, algebra of linear transformations, dual space, eigen values and eigen vectors.
- Students can solve system of linear equations.
- Students can recognize the concepts of the terms of span, linear independence, basis and dimension and apply these concepts to various vector spaces and subspaces.
- **CO-03: Dynamics:**
- Students will construct free-body diagrams
- Students will discuss easily the motion on smooth and rough planes, general motion of rigid body.
- They will understand the analysis of distributed loads.
- They will understand a broad knowledge of internal forces and moments.
- They will be able to apply Kepler's law to solve the problems.

**B.A Economics**

**B.A Economics Micro Economics 1<sup>st</sup> and 2<sup>nd</sup> Semester**

- CO1: Demonstrate understanding of basic concepts of Business Economics.
- CO2: Analyse the Consumer behaviour through different approaches.
- CO3: Carry Out the consumer behaviour under different types of goods.
- CO4: Analyse the Consumer Behaviour under Certainty and Uncertainty.
- CO5: Demonstrate the Concept of Production function i.e. to analyse the economic behaviour of producer and Concept related to it.
- CO6: Explain the economic behaviour of Market in different types of market structure.
- CO7: Critically assess the theories and model related to market.
- CO8: Explain the concept of cost and how it affects firm's decision.

**B.A 3<sup>rd</sup> and 4<sup>th</sup> Semester Macroeconomics**



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- CO1: Demonstrate the basic concepts of macroeconomics and its various variables.
- CO2: Carry out the accounting of national income using various methods.
- CO3: Understand about various school of thoughts related to macroeconomics.
- CO4: Explain Conceptual knowledge about Investment and its various theories.
- CO5: Demonstrate the basic understanding about Money Demand and its related concepts.
- CO6: Explain about Money Supply and role of Central bank.
- CO7: Carry out the analysis of Monetary and Fiscal Policy of India.
- CO8: Explain the concept of Inflation and how it affects economy.

## **B.A 5<sup>th</sup> and 6<sup>th</sup> Semester Development and International Economics**

- CO1: Understand the concept of economic, economic growth and sustainable development.
- CO2: Explain the methods of measuring economic inequality and poverty.
- CO3: Analyze the economic contribution of some classical economists in growth theories.
- CO4: Understand the implacability of some very critical growth models in economic development so far. CO5: Understand and compare some growth models with each other for some betterment of economic growth models.
- CO6: Analyze the role of education, learning and skill in human capital formation.
- CO7: Explain the role of technological progress in a country.
- CO8: Explain balanced and unbalanced model of development.
- CO9: Understand the concept of international trade. Theory of international trade, Concept of BOP and Foreign Exchange.
- CO10: Critically Evaluation of International Organization i.e. IMF, WTO, IBRD BRICS.

## **BA History**

**B.A (Sem-I):** History of India (from earliest times -1200 A.D.), Sources of ancient India, Harppan civilization, Vedic Age, Religious movements, Mauryan and Gupta Empire.

**B.A (Sem-II):** History of India (1200 A.D. to 1707 A.D.), Delhi Sultanate, Mughal Empire, Administrative Institutional, Bhakti movement, Sufi movement.

**B.A (Sem-III):** History of India (1707 A.D. to 1947 A.D.), Disintegration of Central authority, Revolt of 1857, Indian cultural renaissance, British land revenue policy, National freedom movement (1885-1947), Constitutional Development 1909 to 1935.

**B.A (Sem-IV) :** History of Haryana (from earliest times to 1947 A.D.), sources of Haryana, Kurus, Yaudhyas and Agras, Revolt of 1857, Arya Samaj, Freedom movement in Haryana.



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**B.A (Sem-V) :** Ancient and Medieval world, Pre-Historic cultures, Bronze age civilization, Iron Age, Federalism, Islamic world, Reformation.

**B.A (Sem-VI) :** Mercantilism and beginning of capitalism, Agricultural Revolution, French Revolution, First and Second world war.

## **BA (Political Science)**

### **(Sem-01) PAPER: Indian constitution**

- It is very useful for the competitive exams like UPSC, HPSC, and SSC etc.
- We get the knowledge of fundamental duties & rights.
- We also get the information about Union, state executives, legislature & judiciary.

### **(Sem-02) PAPER: Indian Politics**

- We get to know about our elections & EVM machines.
- We found the information about our MLA's & MP's jobs & responsibilities.
- It's also important to know about the roles & responsibilities of our state & central ministers.
- Useful in competitive exams.
- **(Sem-03) PAPER : Principles of Political Science –I**
- Get the knowledge of state, its elements, origin & its development.
- Found the information regarding the distinction between state & society.
- It also provides the information about sovereignty, its nature & kinds.

### **(Sem-04) PAPER: Principles of Political Science –II**

- We get to know about right to information and consumer protection.
- Also get the knowledge of nation, nationalism & citizenship.
- Find the information about rights, liberty & equality.
- **(Sem-05) PAPER 5 : Comparative Politics**
- We get to know about the voting behavior of country.
- It provides us the information about structural functions & political development approaches.
- Also find the knowledge about constitutionalism.
- **(Sem-06) PAPER: Comparative constitutions of UK & USA**
- Students get to know about the comparative study of UK & USA for their government & constitutions.
- We get to know about the rules of Govt. making in other countries like UK & USA.
- We can get comparative elements of constitutions of UK & USA.
- Useful in competitive exams as well.

## **BA Geography**

### **Semester 1<sup>st</sup> Geography**

- The syllabus of geography for undergraduate course has been divided into six



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semesters through which different theories and practical papers have taught to the students to enhance their knowledge about subjects.

- During 1<sup>st</sup> semester theory paper of Geography of India and practical paper Map and Scales teaches to the students. The basic objectives of theory paper are to develop the comprehensive understanding of the geographical profile of India.
- The roll of geographical attributes in determining social and economic structure of country has very much significant.
- The overall outcome of this course is to enable the students to enhance the basic understanding about physical and cultural features of our country.
- Whereas if you talk about practical paper, this course aimed to provide the basic understanding of particular technique of drawing, cartograms, maps to show various natural and socio- economic attributes of a region.

## Semester 2<sup>nd</sup> Geography

- The knowledge of physical Geography has given to students during 2<sup>nd</sup> semester.
- The main objective of this course is to introduce the students the basic and fundamental concepts of physical geography and geomorphology.
- In this semester practical paper Representation of Physical Features has been introduced aiming with to provide basic understanding about structure of Topographical maps and representation of geographical features through various techniques on maps to students.

## Semester 3<sup>rd</sup> Geography

- Climatology and Oceanography are two important branches of Physical geography have been taught to the students during this semester.
- The major objectives of this course is to enhance the basic understanding about structure of atmosphere and its circulation, weather, climate and other associating phenomena.
- The origin movements and configuration of oceans are also covered in this semester.
- Where as in practical paper Representation of climate data, the students would be unable to acquaint themselves about the different instruments to measuring various weather elements and methods to represent them on the plain paper.



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### **Semester 4<sup>th</sup> Geography**

- During 4<sup>th</sup> semester the theory paper Human Geography has been introduced and the main aim of this course is to acquaint the students with basics of human geography- nature of man environment relationship and human capability to adopt and modify the environment under its various conditions from primitive life style to modern living; to identify and understand environment and population in terms of their quality and spatial distribution pattern and to comprehend to contemporary issue facing global community.
- In practical paper Map Projection, the students have to enable to understand various methods of map making and types of map projection. Map projections are necessary for accurate transformation of 3-D surface.
- The basic aim of this course it to develop basic understanding of maps and selection of suitable projection for them.

### **Semester 5<sup>th</sup> Geography**

- In their 5<sup>th</sup> semester, students have to learn about Economic geography, one of the major branches of human geography.
- The main objective of this course it to introduce the students about basic concepts of economic geography, types of economic activities and its determinants, various recourses which were used by human being through various methods and means.
- Where as in practical paper, distribution maps and diagrams, the main objective of this course is to provide the students about basic understanding and representation of map making for the distribution of various geographical elements.

### **Semester 6<sup>th</sup> Geography**

- The theory paper „Introduction to Remote Sensing, GIS and Quantitative methods“ has been introduced in last semester of UG course.
- The aim of this course is to introduce the students to modern technology i.e. remote sensing its basic concepts and digital satellite imageries, data set and their application.
- The students have to learn different statistical methods that will be very fruitful for them. In practical paper the aim of this course is to acquaint the students about aerial photograph and satellite imageries, their process and methodology and also



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familiarize the students with importance of field work in geography, its type and related requirement and procedure.

## **BA PSYCHOLOGY**

### **B. A. I**

#### **Paper: I Invitation to Psychology**

- Making familiar with the foundations of Psychology.
- Acquaintance with cognitive process, states consciousness and learning.
- Acquaintance with memory processes.

#### **Paper: II Experimental Psychology**

- Making familiar with the field of general Psychology.
- Acquaintance with intelligence, motivation and emotions through experiments.
- Acquaintance with Personality.

### **B.A.II**

#### **Paper III Development Psychology**

- Understand the development processes of Infants, Adolescence, early adulthood, Middle Adulthood and Late Adulthood.
- Understanding the social development and emotional development of child.

#### **Paper – IV Social Psychology**

- Understanding the social process.
- Understanding the social perception.
- Acquaintance with the knowledge of Interpersonal Attraction
- Understanding the Processes of Aggression.

### **B A III**

#### **Paper No. : V Psychopathology**

- Getting acquainted with field of psychopathology.
- Introduction to various models of abnormality.
- Knowing about the nature, types and perspectives of disorders of childhood and adolescence.

#### **Paper – VI Applied Psychology**



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- Understanding the applications of the psychology.
- Knowledge about the interpersonal communication process.
- Understanding the stress and its effect.

Knowledge of the relationship between psychology and physical health

## **BA Physical Education**

### **Semester 1**

#### **Paper: Principles and foundations of physical education**

- After going through the contents of the paper the students developed the basic understanding of physical education.
- Students came to know about the historical perspective, aim objectives and scope of physical education.
- Students got the knowledge of various sports organisations which are working to promote and develop sports in India.
- The students also had the knowledge of various types of awards and incentives being conferred by the government of India to outstanding sports persons.

### **Semester 2**

#### **Paper: Health and yoga**

- After having studied this paper the students got an understanding of concept of health education, health and their importance for the society.
- Students learn what hygiene is and how they can take care of their personal hygiene.
- The students came to know about the communicable and noncommunicable disease and how they can be prevented.
- The students learn to perform asana and got basic knowledge of yoga and benefits of asanas.

### **Semester 3rd**

#### **Paper: Physical activity and health**

- After successful completion of this paper the students were able to understand the real value of health education and role of physical activities in promoting health.
- The students got an understanding of nutrition and balance diet and how vegetarian diet is better than non-vegetarian diet.
- The students came to know about importance of correct posture in one's life and how postural deformities can be corrected with the help of exercise and balanced diet.
- The students got basic knowledge of First aid and what they should do in case of accidents like snake bite, fracture, heat stroke, drowning, burns etc.
- How exercise can be beneficial in preventing lifestyle disease like obesity and diabetes.

### **Semester IV**

#### **Paper: Physical Fitness and Yoga**

- After completion of this course the students were able to explain the need,



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importance, objectives and relationship of physical education with general education.

- The students were able to explain physical fitness and how warming up and cooling down affects the performance.
- The students got the knowledge of Kriyas and how shuddhi kriyas clean internal systems of human organism.
- The students got knowledge of some sports promoting agencies in India like AICS, IOC and YWCA.
- Students were able to explain the educational values of camping.

## Semester 5

### Paper: Socio- Psychological Foundations of Physical Education

- The students were able to explain basic laws of learning and how these laws can be utilised for better and effective learning
- The students got the knowledge of motivation, adjustment and individual differences and role of these psychological concepts in effective learning and overall development of personality.
- The students got an understanding of how sports are a socializing agency and how sports are associated with economy and how spectators and crowd behavior can influence the sports performance of athletes.
- The students were in a better position to explain methods of conditioning and why they should not indulge in doping.

## Semester 6th

### Paper: organisation and management of physical education

- The students were able to do the marking of Athletic track and came to know how various types of tracks can be maintained properly.
- They were able to organise athletic meet and conduct tournaments.
- The students got the knowledge of sports injuries and how sports injuries can be prevented and role of physical education teacher in rehabilitation.
- The students came to know about sports management and qualities and qualifications required for a good physical education teacher.
- The students were able to understand the significance of professional preparation and how an impressive curriculum can be designed in the field of physical education.

## ENVIRONMENTAL STUDIES (B.A, B.COM, B.SC 1)

- Understanding environmental concerns by the students at the under graduate level.
- Understanding the relationship of man with the environment and help them change his attitude for more positive, proactive, eco-friendly and sustainable lifestyles.
- Getting information about climate change, global warming, acid rain, greenhouse effect , ozone layer depletion.
- Cultivating attitudes to safeguard the environment built particularly with field



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experience.

- Control of environmental pollutions like air , water , soil , noise and e-pollutions etc.
- Realization of the impact of human actions on the immediate environment and the linkage with the larger issues.
- Conservation and management of natural resources like air , water , mineral , forest and biodiversity etc.
- Motivating public for sustainable development i.e. economic development without degrading the environment.
- Getting information about environment protection acts and laws .
- Acquire the skills for identifying and solving environmental problems like deforestation, water crises etc.

## B.COM COURSE OUTCOMES

### B.Com (Sem-01)

#### Subject: Financial accounting I

- To record the basic journal entries.
- Memorize how to calculate depreciation by applying various methods.
- Maintain the financial statements of a business entity.
- Rectify errors in accounts.

#### Subject: Business Mathematics I

- To apply basic terms of integration in solving practical problems field of as of business.
- To explain basic methods of business calculus, types and methods of interest account and their basic applications in practice.
- To solve problems in the areas of business calculus, simple and compound interest account, use of compound interest account, loan and consumer credit.
- To discuss effects of various types and methods of interest account.
- Connect acquired knowledge and skills with practical problems in economic practice.

#### Subject: Business Economics

- Understand how households (demand) and businesses (supply) interact in various market structures to determine price and quantity of a good produced.
- Understand the links between household behavior and the economic models of demand.



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- Represent demand, in graphical form, including the downward slope of the demand curve and what shifts the demand curve.
- Understand the links between production costs and the economic models of supply.
- Apply the concept of opportunity cost
- Analyze operations of markets under varying competitive conditions

## **Subject: Business Management**

- Use business terms and concepts when communicating.
- Explain the financial concepts used in making business decision.
- Use effective communication skills to promote respect and relationship.
- Utilize information by applying a variety of business and industry software and hardware to major business function.
- Demonstrate a basic understanding of business management.

## **Subject: Business Communication Skills**

- To make effective and impressive communication.
- To make communication in ethical manner.
- Capable to make persuasive digital communication.
- Capable to make abstract & summaries of proposals.
- Better presentation and communication using proper body language.

## **Subject: Basics of Computer-I**

- Understand the concept of input and output devices of Computers and how it works.
- Understand the concepts, structure, types and design of operating Systems.
- Understand the concept of Data Communication, its Modes, its Forms and Data Communication Channels.
- Understand evolution of internet, its application and its basic services.
- Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
- Create and design a word document for general office use.
- Students will have a working knowledge of paragraph formatting, macro and mail-merge in MS-Word.



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## B.Com (Sem-02)

### Subject: Financial Accounting-II

- Student can able to make necessary journal entries in the books of record under hire purchase method.
- Able to maintain royalty and joint venture accounts.
- Easily examine the dissolution of partnership.
- Easily can prepare the journal entries of amalgamations and sale of partnership firms.

### Subject: Business Mathematics-II

- Define basic terms in the areas of business calculus and financial mathematics.
- Explain basic methods of business calculus, types and methods of interest account and their basic applications in practice.
- Solve problems in the areas of business calculus, simple and compound interest account, use of compound interest account, loan and consumer credit.
- Discern effects of various types and methods of interest account.
- Connect acquired knowledge and skills with practical problems in economic practice.

### Subject: Business Economics-II

- Apply marginal analysis to the “firm” under different market conditions;
- Understand the causes and consequences of different market structures;
- Apply economic models to examine current economic issues and evaluate policy options for addressing these issue
- Understand the meaning of marginal revenue and marginal cost and their relevance for firm profitability.

### Subject: Business Management-II

- Use business terms and concepts when communicating.
- Explain the financial concepts used in making business decision.
- Use effective communication skills to promote respect and relationship.
- Utilize information by applying a variety of business and industry software and hardware to major business function.
- Demonstrate a basic understanding of business management.



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## Subject: Business Environment

- Define various elements internal as well as external affecting business environment.
- Explain the techniques like SWOT analysis.
- Define the terms like inflation, GDP, etc.
- Define the consequences with regard to BOP.
- Explain the economic trends and effect of Govt. policies as LPG.

## Subject: Basics of Computers-II

- Student will be able to understand the concept of input and output devices of Computers and how it works.
- Students will be able to understand the concepts, structure, types and design of operating Systems.
- Student will be able to recognize when to use each of the Microsoft Office programs to create professional and academic documents.
- Student will be introduced to create and design a spreadsheet for general office use.
- Students will have a working knowledge of basic functions and formulas in MS- Excel.

## B.Com (Sem-04)

### Subject: Corporate Accounting-I

- Learn about the journal entries of issue of shares and issue of debentures.
- To know about the meaning of companies and working style of companies.
- Know about the final accounts of the companies.
- Learn about the valuation method of shares and goodwill and measurement of performance of companies.
- Work with profit prior to incorporation and post incorporation profits in company's accounts.
- Learn about the concept of sources of redemption of debentures and redemption of preference shares.

### Subject: Business Statistics-I

- Student will be able to apply knowledge to solve simple tasks using computer (MS Excel)
- Student will be able to independently calculate basic statistical parameters (mean, measures of dispersion, correlation coefficient, indexes)
- Student will be able to interpret the meaning of the calculated statistical indicators
- Student will be able to choose a statistical method for solving practical problems



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- Student will able to explain probability theory and probability distributions in relation to general statistical analysis.
- Student will able to Understand and appreciate the need to solve a variety of business- related problems using a systematic approach involving accepted statistical techniques.

## **Subject: Business regulatory framework-I**

- Learn the difference between valid void and voidable contract.
- Memorize difference between contract of guarantee and indemnity.
- Analysis the rights and duties of pawn or Pawnee under contract of bailment.
- Learn how to pursue the consumer rights under consumer protection act 1982.

## **Subject: Corporate Law-I**

- Know about the concept of company and shares.
- Know about the company law in the India.
- Understand the use of the memorandum of association and article of association in a company, they also learn from this course.
- Use of prospectus in a company.
- Understand the relationship between company and debenture holders.

## **Subject: Macroeconomics**

- Understand the basics of national income accounting
- Understand the causes and consequences of business cycles
- Understand the roles of fiscal and monetary policy in fighting recessions and inflation
- Understand factors that contribute to and detract from long-term economic growth
- Apply economic reasoning to understand the operation of an economy
- Apply basic international trade and finance concepts to global pricing issues, including working with exchange rates.

## **Subject: Human resource management**

- Learn the qualities of human resource manager in an organization.
- Analysis the importance of different methods of training given to the



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employees

in organization.

- Memorize the difference between on the job training and of the job training.
- Learn the participant of industrial relation and recruitment of good industrial relation programme.

## **B.Com (Sem-04)**

### **Subject Corporate Accounting-II**

- Know about the companies all accounts.
- Get the Knowledge of banking system.
- Learn about working format of companies.
- Understand Mutual funds" investments.
- Find out how a company can dissolve.

### **Subject: Business Statistics-II**

- Student will able to apply knowledge to solve simple tasks using computer (MS Excel)
- Student will able to independently calculate basic statistical parameters (mean, measures of dispersion, correlation coefficient, indexes)
- Student will able to interpret the meaning of the calculated statistical indicators
- Student will able to choose a statistical method for solving practical problems
- Student will able to explain probability theory and probability distributions in relation to general statistical analysis.
- Student will able to Understand and appreciate the need to solve a variety of business- related problems using a systematic approach involving accepted statistical techniques.

### **Subject: Business Regulatory Framework-II**

- Can able to learn the conditions of partnership act.
- Critically evaluate conditions and warranties of sale of goods act.
- Aware about rights to information.
- Can able to use negotiable instrument in practical life.

### **Subject Corporate Law-II**

- Student will able to develop in the student an understanding of the free enterprise system and the legal safeguards of the same.
- Student will able to demonstrate clearly and forcibly the generally accepted, but not always documented, proposition that law is an expression of the public will; that a law is valid in the real sense only when it is an expression of the public will.
- Student will able to develop in the student and appreciation of the significant role



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played by the judiciary in the protection of individual liberty and private property.

- Student will able to develop in the student habits of analytical thinking and logical reasoning as a technique for decision-making.
- Student will able to develop in the student acceptable attitudes and viewpoints with respect to business ethics and social responsibility.

Student will able to enrich and make more meaningful the study of the other social sciences.

## **Subject: Marketing Management**

- Students can identify how consumer behaves differently.
- Able to understand how a product passes from different stages.
- Able to understand the difference between trademark and branding.
- Able to describe the customer segmentation, target marketing and positioning.
- Understand different methods of sale promotion.

## **Subject: Banking and Banking Law**

- Demonstrate a comprehension of the principles of banking law and its relationship to banks and customers.
- Demonstrate an awareness of law and practice in a banking context.
- Engage in critical analysis of the practice of banking law from a range of perspectives.
- Organize information as it relates to the regulation of banking products and services.

## **B.Com**

### **(Sem-05)**

#### **Subject:**

#### **Taxation**

#### **Law-I**

- Define the procedure of direct tax assessment.
- Able to file IT return on individual basis.
- Able to compute total income and define tax complications and structure.
- Able to understand amendments made from time to time in Finance Act.
- Differentiate between direct and indirect tax assessment.

#### **Subject: Cost Accounting-I**

- Define the various components of total cost of a product i.e. direct & indirect cost and fixed & flexible cost.



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- Determine various levels of material i.e. reorder level, minimum level, maximum level & EOQ for managing working capital.
- Use methods of time-keeping & time-booking and manage idle & overtime.
- Define the features of overhead or indirect cost of production and basis of allocation and apportionment.
- Use cost-sheet to compute unit cost of product.
- Determine basis for computing tender price of a product.

## **Subject: Accounting for Management**

- Use business finance terms and concepts when communicating.
- Explain the financial concepts used in making accounting management decision.
- Use effective communication skills to promote respect and relationship for financial deals.
- Utilize information by applying a variety of business and industry software and hardware to major financial function.
- 5. Demonstrate a basic understanding of accounting management.

## **Subject: Financial market operations**

- Student will able to understand the Australian banking system and describe the role of regulatory bodies in regulating how banks manage their capital.
- Student will able to describe the types of equity securities that companies can use to raise equity capital and how these securities can be listed and traded on the Australian Stock Exchange.
- Student will able to apply different company valuation techniques to determine share prices.
- Student will able to describe the characteristics of different types of debt securities and be able to price them.
- Student will able to describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates.
- Student will able to understand the mechanics and conventions of the foreign exchange market and the motivation of different participants in trading foreign currencies.

## **Subject: Entrepreneurship and small scale business**

- Student will able to understand the basic development of entrepreneurship as a profession.
- Student will have a basic knowledge of human resource management for small



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business.

- Student will able to identify and implement systems for collecting and analyzing information to monitor the performance of a new firm
- Student will able to understand the differences between an entrepreneurial venture and an ongoing business operation.
- Student will able to understand the critical roles of marketing research, competitive analysis, consumer-value proposition, and market-entry strategy in the development of a business plan.
- Student will able to describe examples of entrepreneurial business and actual practice, both successful and unsuccessful, and explain the role and significance of entrepreneurship as a career, in the firm, and in society.
- Student will able to understand the importance and role of ethical, sustainability, innovation and global issues for strategic decision making.
- Student will evaluate different modes of entering into entrepreneurship

## **Subject: Secretarial Practice**

- Use international trade terms and concepts when communicating.
- Explain the international trade concepts used in making decision.
- Use effective communication skills to promote respect and relationship for secretarial practice.
- Utilize information by applying a variety of business and industry software and hardware to major voting and proxy.
- Get a basic understanding of different type of meeting of board of directors.

## **B.Com (Sem-06)**

### **Subject: Taxation Law-II**

- Define the procedure of direct tax assessment.
- Able to file IT return on individual basis.
- Define tax complications and structure.
- Aware about IT authorities and their powers.
- Aware about appeal & revision, tax penalties, offences and prosecutions.

### **Subject: Cost Accounting-II**

- Define the process to compute total cost of a product belong to various production processes.
- Accumulate total cost of a contract assigned.
- Able to prepare various budgets like fixed and flexible budgets.



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- Define the terms with regard to variance analysis.
- Define the terms with regard to BEP analysis.

## **Subject: Financial Management**

- Use business finance terms and concepts when communicating.
- Explain the financial concepts used in making financial management decision.
- Use effective communication skills to promote respect and relationship for financial deals.
- Utilize information by applying a variety of business and industry software and hardware to major financial function.
- Demonstrate a basic understanding of financial management.

## **Subject: Auditing**

- Student will understand the audit process from the engagement planning stage through completion of the audit, as well as the rendering of an audit opinion via the various report options.
- Student will understand auditors' legal liabilities, and be able to apply case law in making judgment whether auditors might be liable to certain parties;
- Student will understand to describe the various levels of persuasiveness of different types of audit evidence and explain the broad principles of audit sampling techniques;
- Student will understand to discuss the need for an independent or external audit and describe briefly the development of the role of the assurance provider in modern business society;
- Student will be able to describe the quality control procedures necessary to ensure that a competent assurance engagement is performed, and apply professional ethics including Code of Conduct to specific scenarios
- Student will explain the internal audit process including the professional standards applicable to the internal audit profession.

## **Subject: GST**

- Student will be able to Compute the assessable value of transactions related to goods and services for levy and determination of duty liability.
- Student will be able to Identify and analyze the procedural aspects under different



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applicable statutes related to Goods and Service taxation.

- Student will able to understand the basic principles underlying the Goods & Service Tax).
- Student will able to understand Tax liability and taxable entities. Accounting treatment (simple and trilateral transactions).
- Student will able to examine the method of tax credit. Inflows and outflows. Outflows: tax imposition, tax exemption, tax deduction.

## Subject: International Trade

- Use international trade terms and concepts when communicating.
- Explain the international trade concepts used in making global decision.
- Use effective communication skills to promote respect and relationship for international trade.
- Utilize information by applying a variety of business and industry software and hardware to major international trade function.

## B.Sc. COURSE OUTCOMES

### B.Sc. 1<sup>st</sup> Semester Physics

#### Subject: Mechanics (Subject Code: PHY-101)

- Get the knowledge about forces helps the students in their daily life.
- The velocity and acceleration parameter give the knowledge about how the move vehicles.
- The information will teach the students about the rolling concept.

#### Subject: Electricity and Magnetism (Subject Code: PHY-102)

- Explain various phenomenon like Ferromagnetism, ant ferromagnetism etc.
- Understand the relation in between Electromagnetic theory.
- Explain various phenomenon"s in light of Maxwell equations.

### B.Sc. 2<sup>nd</sup> Semester

#### Subject: Properties of Matter, Kinetic Theory and Relativity (Subject code: PHY-201)

- Students will be able to identify the type of force, type of supports and the reactions on beams and plane frames.
- The students shall be familiar with the fundamental principles of the general theory of relativity.
- They shall know the meaning of basic concepts like the equivalence principles; inertial frames and time dilation establish the non-existence of the hypothesized stationary aether through the null result of Michelson-Morley experiments with interferometer.



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- Explain the true nature of Newtonian mechanics and Lorentz Transformation equations. Understand the concept of constant relative motion of different bodies in different frames of references

## **Subject: Electromagnetic Induction & Electronic Devices (Subject Code: PHY-202)**

After the completion of the course, Students will be able to:

- Students shall learn about the significance of electric components.
- Significance of various devices and how they will operate.
- It will teach the students about the circuit connection.
- About the graphical relationship of resistance, capacitor and inductor.

## **B.Sc. 3<sup>rd</sup> Semester**

### **Subject: Computer Programming & Thermodynamics (Subject Code: PHY-301)**

- Understand the FORTRAN programming language.
- Be capable of specifying the simplified syntax of programming languages (FORTRAN).
- Understand the concept of thermodynamics and there laws.
- Understand the Heat Engine and there uses.
- Describe the thermodynamic function and there relations.

### **Subject: Optics I (Subject Code: PHY-302)**

- Understand the physics behind various phenomenons in wave and optics.
- Understand various phenomenons and the cause or origin of them.
- Explain the relationship in between various optical phenomenons with the Fourier series and matrix.

## **B.Sc. 4<sup>th</sup> Semester**

### **Subject: Statistical Mechanics (Subject Code: PHY 401)**

- They are able to interpret different types of events.
- Students have understood the concept of phase space and its volume.
- They can easily distinguish between different types of particles and statistics and can easily distribute bosons, fermions and classical particles among energy levels.
- After studying Fermi Dirac statistics, students have learnt to deal with much electron system in real life.



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**Subject: Optics II (Subject Code: PHY-402)**

- Understand the physics behind various optical phenomenon's.
- Understand various natural phenomena which are happening in their surroundings.
- 3. Explain the relationship in between various optical phenomena. Understand the basic concept of probability and applications involving probability.

**B.Sc. 5<sup>th</sup> Semester**

**Subject: Solid State Physics (Subject code: PHY-501)**

- Demonstrate an understanding of the crystal lattice and how the main lattice types are described
- Formulate the theory of X-ray diffraction in the reciprocal lattice (k-space) formalism and apply this knowledge to generalize the formulation for matter waves be able to perform structure determination of simple structures
- Learn that Dulong-Petit Law is valid only at high temperature.
- Learn that lattice specific heat of solid vary  $T^3$  at very low temperature.

**Subject: Quantum mechanics (Subject Code: PHY-502)**

- Historical aspects of development or origin of quantum mechanics.
- To explain the differences between classical and quantum mechanics.
- Understand the idea of wave function and its physical significance.
- Understand the uncertainty principle and solved the various problem based on it.
- Able to Solve Schrodinger equations for simple potentials barrier, partial in infinite potential box and harmonic oscillator.

**B.Sc. 6<sup>th</sup> Semester**

**Subject: Atomic, Molecular and Laser Physics (Subject Code: PHY-601)**

- Describe theories explaining the structure of atoms and the origin of the observed spectra.
- Identify atomic effect such as Zeeman Effect and Stark effect.
- List different types of atomic spectra.
- Explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields.
- To study the different type of Laser used in various applications and comparative study of different type of laser.

**Subject: Nuclear Physics (Subject Code: PHY 602)**

- After taking this course, students are able to determine the charge, mass of any nucleus by using various spectrographs.
- They are able to understand the size of nucleus and all its properties.
- This course has led the students to understand interaction of various types of radiation



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with matter which they observe in their daily life. It's easy for them now to relate the theory to practical.

- Students now know various methods of accelerating various types of particles to perform scattering experiments.
- Students are able to understand the detecting methods and instruments for different types of charged and neutral particles.

## DEPARTMENT OF BOTANY

### Bot 1.1 & 1.2 (Semester 1)

- Study and impart knowledge about the general characters, Life history, structure, reproduction and economic importance of Algae and Fungi.
- To know about the various plant diseases and their control measures.
- Study of Lichens, their types and significance.
- Learn about microscope handling technique.
- Understand the structure and chemical composition of cell and cell organelles.
- Learn about the concept of cell division.
- Understand the process of cell division by preparation of slides using onion root tips.

### Bot 2.1 & 2.2 (semester 2<sup>nd</sup>)

- Students able to explain about the structure, classification, life cycle and economic importance of Bryophytes and Pteritophytes.
- Learn the evolution of stellar system and origin of seed habit in plants.
- Students get practical knowledge about the various lower groups of plants.
- Understand the phylogenetic relationships between the groups of plants.
- Students get detailed knowledge about economic importance and other value added products obtained from plants.
- Understand the concept of Mendelian Inheritance and various laws.
- Understand the process of cellular protein synthesis and role of cell organelles involved in translation.
- Understand the structure and chemical composition of DNA, RNA and chromatin material.
- Study of cell organelles and their functions.
- Practical knowledge of genetics, laws of inheritance by working out problems/numericals.
- Understand the applications of plant sciences in various fields.

### 4.1 BIOLOGY AND B3.1 BOT 3.1 BIOLOGY AND DIVERSITY OF SEED PLANTS

- The diversity of plants can be attributed to pollination and herbivory, both examples of



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coevolution between animals and plants.

- Seed serves several functions for the plants that produce them.
- These reserves are what make many cereals and legumes major food sources for a large proportion of the world's inhabitant.
- Examine the diversity of seed plants, Ginkgo has been used for

medicinal purposes. BOT 3.2 PLANT ANATOMY

- These studies are very important because they lead to a better understanding of how to care for plants and fight plant diseases.
- Plant anatomy provides characters such as trichomes, stomata, circular pattern, leaf Venetian, wood anatomy, growth rings etc.
- It helps us to understand the structural adaptations of plants with respect to diverse environmental conditions.
- It's linked to plant physiology., Hence it helps in the improvement of food crops.
- It is helpful in to determine the age of plants.

BOT 4.1 DIVERSITY OF SEED PLANTS

- Plant taxonomy aims at providing a classification which reconstructs the evolutionary history of plant kingdom.
- Both useful and harmful species of plant are so intimately associated with our daily life that it becomes necessary to arrange them in orderly and scientific system
- It is valuable study regarding distribution, habit, habitat, distinct character of plants and plants groups which fulfil its objectives.
- Systematized study of plants had benefitted not only to botanists but to those who are related with forestry, coal, medicine, food industries etc.

BOT 4.2 Plant Embryology

- Embryology helps to understand other branches of biology like genetics, cytology, physiology, evolution etc.
- In the medicinal field embryology is immensely helpful.
- It helps to understand the phylogenetic relationships between the different groups if plants.



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- Embryology is one of the most important divisions of botany, its methods and goals are separate from those of plant morphology.

## **BOT 5.1 Plant Physiology:**

- Enable to learn about control of plant development & reproduction. It applies in agriculture for production of different variety of crops and increases their yield in short period.
- Helpful in production of secondary products likes drugs, cosmetics, resins, gums etc.
- Learn about plant hormones and their role in commercial scales ex. Auxin and Cytokinin for multiplication of plants, GA in sugar production and Ethylene in artificial fruit ripening etc.
- Enable to research & higher education in agriculture (as scientist).

## **BOT 5.2 Ecology:**

- Learn and motivate the students about the conservation of nature and natural resources.
- Focus on role of man in degradation of environment by pollution, animal killing, deforestation, population explosion etc. and suggest remedies for these problems.
- Sustainable use of nature with environment problem regulation/ natural resource management.
- Students are enabling for applying the government / private Sector jobs on basis of graduation.
- Enable to research & higher education in environmental science (as scientist/ Conservatist/ environmental consultant).

## **BOT 6.1 Biochemistry and Biotechnology:**

- Learn about commercial production of different plants.
- Learn about essential chemical reaction going on living organism and their control in disease.
- Learn to cure various diseases
- To enable the use of different technology for welfare of human being.
- To enable research and higher studies in medical field and environmental conservation.

## **BOT 6.2 Economic Botany:**

- Recognition and naming of plants based on their plant part use /products.
- Learn about the cultivation, process & uses of different yielding plants such as food, cereals, oil, fibers, sugarcane, rubber etc.
- Learn about the cultivation, process of timber yielding plants with crop (agro forestry); make dual benefits ecological as well as economical.
- Learn about the cultivation and uses of spice yielding and medicinal plants so they can cure their disease at home.
- They can start their business on basis of crop production and their prices.
- Learn about the cultivation, process of biofuels and energy plantation in



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solving environmental problems.

## Dept. of Zoology

### B. Sc Ist (Medical) 1st semester (Life and Diversity From Protozoa to Helminthes)

- Knowledge of environmental creatures is gained.
- Know about their economic benefits and ill effects.
- Cure diseases by controlling their specified organisms.
- Maintain diversity of environment to sustain better life.

### B. Sc 1st (Medical) 1st semester (Cell Biology)

- Know the building blocks of life.
- Treat cancer and remove it utmost from the world.
- Differentiate organisms on the basis of cellular level.
- Know about various sets of signaling and specifications occurring in one's own body.

### B. Sc 1st (Medical) 2nd semester (Life and diversity of Annelida to Hemichordata)

- Annelids taught how to be a helping hand in agriculture.
- Arthropods being the one who are best for pollination in plants.
- Act as connecting link in evolution.
- Molluscs and Echinoderms lead to the study of aquatic life forms and meanwhile, molluscs act as economically beneficial. Example-pearl.

### B. Sc 1st (Medical) 2nd semester (Genetics)

- Find out the cause of disease resides in the genome sequence.
- Figure out the gene structure of an organism.
- Calculate the anomalous behavior of organisms via C-value paradox.
- Find out the alteration and aberration in general/chromosomal structure of an organism leading to disease.

### B.Sc IInd (Medical) 3<sup>rd</sup> SEM Life & Diversity of

#### Chordates-I Course outcomes:

- Provides students with an in-depth knowledge of diversity in form, structure & habits of chordates.
- Learn basics of systematic & understand hierarchy of different categories in chordates.
- To describe the unique characters of Urochordata, Cephalochordata & Fishes.
- To recognize the life functions of Urochordates, Cephalochordates & Fishes.
- Imparts conceptual knowledge of vertebrate adaptations in relation to their environment.



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**B.Sc IInd (Medical) 3<sup>rd</sup> SEM Mammalian Physiology-I**

**Course outcomes:**

- To understand the various Biomolecules in mammalian body.
- To understand the structural chemistry of proteins, carbohydrates & fats.
- To understand the functions of Biomolecules.
- To understand the metabolic activities in mammalian body.
- To understand the physiology at the cellular &

system level. **B.Sc IInd (Medical) 4th SEM Life &**

**Diversity of Chordates-II Course outcomes:**

- Obtain overview of economically important chordates.
- To understand the origin & evolutionary relationship in different subphylum of chordates.
- To describe the unique characters of amphibians, reptiles, aves & mammals.
- To recognize the life functions of amphibians, reptiles, aves & mammals.
- To understand the ecological role of different classes of chordates.

**B.Sc IInd (Medical) 4th SEM Mammalian**

**Physiology-II Course outcomes:**

To understand how mammalian body get nutrition from different Biomolecules.

- To understand the nature of endocrine glands & their secretions.
- To understand the blood flow & working of heart.
- To understand how physiological parameters are measured in mammals.
- To describe the physiology of respiratory, renal. Endocrine & reproductive system to define their normal & abnormal functions.

**B.Sc IInd (Medical) 5<sup>th</sup> SEM**

**Fish & fisheries Course**

**outcomes:**

Provides students with an in-depth knowledge of different types of fish culture.

- Learn about the consumable fish of fresh water & marine water.
- Learn about the different types of foods needs to provide to the different stages of fish.
- To recognize different types of Fishing craft and fishing gears used in fish capturing.

**B.Sc IInd (Medical) 5th Ecology**

**and evolution Course outcomes:**



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- To understand the various factors which affect our environment?
- To understand the structural components of environment.
- To understand ecosystem energetics, food chain food web.
- To understand the evolution theories, process of speciation.
- To understand the phylogeny of human.

## B.Sc III (Medical) 6th SEM

### Entomology Course

#### outcomes:

- To understand about different types of pest of cash crops, Vegetables and stored grain.
- To understand about different control methods of pest control.
- To understand about integrated pest management.

### B.Sc III (Medical) 6th Sem

#### Developmental biology Course outcomes:

- To understand the process of gamete formation.
- To understand Fertilization and further development process in invertebrate and vertebrate.
- To understand the scope of developmental biology.

#### (Chemistry)

#### Semester I: (Chemistry)

- Inorganic Chemistry: Students will have a firm foundation in the fundamentals and application of inorganic chemistry and can easily assess the properties of all elements.
- Organic Chemistry: Students will be informed about the structure and bonding of organic compounds, their reactions and use in daily life.
- Physical Chemistry: Learning about mathematical concepts and computer will help to carry out scientific experiments and analyses the results accurately.

#### Semester II: (Chemistry)

- Inorganic Chemistry: Students will become familiar with metallic bonding, semiconductor and ability to differentiate periodic elements. Students will appreciate the central role of chemistry in our society.
- Organic Chemistry: Aromaticity and arena will help the students to explore new areas



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in study of chemistry and allied fields of science and technology. Various types of reactions will create interest among students.

- Physical Chemistry: Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems. Students will be able to clearly communicate the scientific work in oral, written and electronic format to both scientists and public and acts as a member of interdisciplinary problem solving team.

### **Semester III: (Chemistry)**

- Inorganic Chemistry: Student's will become more familiar with the elements of periodic table and it will enhance their understanding of day to day uses of the elements and their compounds in daily life. Student's will also become aware of solvents used other than water.
- Organic Chemistry: This semester's syllabus will enhance their understanding of the organic chemistry via mechanistic details of the chemical reactions. They will become familiar about the uses of various chemicals like alcohols, acids and nitro compounds in day to day life.
- Physical Chemistry: Student's will become aware about the relative solubility of a reagent in two different solvents. This Semester's syllabus will help students in understanding of basics of thermodynamics.

### **Semester IV: (Chemistry)**

- Inorganic Chemistry: Students will become aware of the methods of extraction and separation of lanthanides & actinides from their ores. Students will also become familiar with the uses of radioactive elements in medical line. It will create their interest in industries.
- Organic Chemistry: A new branch of chemistry i.e. IR spectroscopy will be introduced and students will learn how IR spectroscopy is helpful in the structure determination of unknown organic compounds. This semester's syllabus will develop scientific temperament among students and they will be motivated for research in the subject.
- Physical Chemistry: Learning of the concepts of electrochemistry will make students aware about the day to day uses of concept like electroplating etc. Further, reading of thermodynamics will make them aware about the feasibility of various processes in terms of entropy change and free energy change. Study of Carnot cycle will give them an insight about the working of refrigerator.

### **Semester V: (Chemistry)**



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- Organic Chemistry: students will be skilled how to determine structure of molecules using NMR
- Techniques. They learn how to design synthesis of organic molecules.
- Physical Chemistry: - Students will gain an understanding of how molecular phenomena can be related to model problems and how to interpret spectra. They learn about the difference between classical and quantum mechanics and connection of quantum mechanical operator to observe values.
- Inorganic Chemistry: - Students will be informed about the properties of coordination compounds. Students will understand the bonding and molecular orbital and crystal field splitting theory. Students will be able to explain spectroscopic properties, magnetic properties and reaction mechanism of coordination compounds.

## Semester VI: (Chemistry)

- Organic Chemistry: Students will understand the mechanism of organic reaction to predict the outcome of reactions and chemical and molecular process that take place in organic chemical reaction. Students will know about fundamental properties and reactivity of biological important molecules.
- Physical Chemistry:-Students will learn general feature of absorption, photo electronic spectra and their dependence on sample properties. Student will be able to identify the term symbol of molecules.
- Inorganic Chemistry: Students will be informed how health, disease, and modern medicine are related to biological chemistry. Students will be skilled in key concepts of inorganic and organometallic chemistry related to synthesis reaction chemistry and structure and bonding. Students will learn how to maintain high standard of professional and scientific ethics.

## M.Sc. Geography Semester I

### 19 GEO 101 Geomorphology

**Objective:** The course aims to familiarize the students with the need for understanding of geomorphology with reference to certain fundamental concepts, focusing on the unity of geomorphology in the earth materials and the processes with or without an element of time. A few selected applications of geomorphology to societal requirements and quality of environment are also dealt with in the course.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked



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from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### **Unit I: Fundamental Concepts in Geomorphology**

Geomorphology: Nature, Scope & Concept. Basic Principal of Geomorphology, Climatogenetic Geomorphology, Concepts of Threshold & Magnitude. Recent trends in geomorphology.

### **Unit II: Earth interior & Dynamic Forces**

Continental drift theory and its basic considerations; Plate tectonics – Plate margins and boundaries, movement and distribution of plates, tectonic activities along the boundaries. Earthquake – causes, classification, intensity and magnitude, geographical distribution. Volcanism – mechanism and causes, classification and geographical distribution. Classification of geomorphic Processes: Exogenetic Processes, Endogenetic processes – Faulting, folding and their geomorphic expressions.

### **Unit III: Exogenetic Processes**

Exogenetic Processes –Weathering: Causes, type of weathering: mechanical, chemical and biological; rock weathering and soil formation. Mass wasting: causes, classifications and types of mass movement- slow and rapid mass movements, Hillslope analysis: techniques and theories, mode and rate of slope retreat.

### **Unit IV: Applied Geomorphology**

Applied geomorphology: meaning and concept; role of geomorphology in environmental management, Geomorphic processes and resulting landforms: Fluvial, Glacial, Aeolian and Karst.

## **M.Sc. Geography Semester I**

### **19 GEO 102 Economic Geography**

**Objective:** The basic aim of this course is to provide the basic understanding of nature & scope of economic geography with reference to the economic development, structure and role of world trade blocks in globalizing world.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### **Unit I: Nature & Scope in Economic Geography**

Economic Geography: Definition, nature, scope and approaches; Relationship of economic geography with economics and other branches of social sciences; World Economies: bases of classification, patterns and characteristics of developed and developing economies of the world.

### **Unit II: Functional Classification of Economic Activities**

Functional Classification of Economic Activities: Primary, Secondary, Tertiary activities, Knowledge & Quaternary. World production and distribution of energy resources: coal and



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petroleum. World production and distribution of mineral resources: iron ore and bauxite.

## Unit III: Network Structure and Economic Activities

Network structure and economic activities, impact of transport on economic activities, Classification of industries: Resource based and footloose industries. Theories of industrial location - Ullman, Weber, Isard and Losch.

## Unit IV: Concept of Economic Growth and Development

Concept of economic growth and development, globalization and pattern of economic development, Emergence of a new global economy – transnational integration and its spatial outcomes. Major regional trade blocks of the world, free trade initiatives (GATT, UNCTAD, WTO).

## M.Sc. Geography Semester I

### 19 GEO 103 Geography of India

**Objective:** The basic aim of this course is to provide understanding about the location and geographical dimensions of India with detailed elaborations of physiography, climatic conditions, social composition, economic development and regionalization of India.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### Unit I: Physical Structure

India: size, shape and location. Unity in Diversity; Geological structure and relief, drainage system, climatic conditions, Soil and natural vegetation - Distribution, characteristics and conservation.

### Unit II: Population Characteristics & Social Composition

Population distribution and growth, age and sex composition; literacy rate and differentials; Ethnic groups; linguistic and religious groups in context of unity in diversity in India. Features of Urbanization.

### Unit III: Distribution of Resources and Economy

Economy: main features and problems of Indian agriculture, Green, white, blue and yellow revolutions; Regional distribution of major minerals and power resources – iron ore, mica, bauxite, copper, coal, petroleum and natural gas. Industrial Regions; New Industrial Policy; Problems and prospect of transportation with reference to railways, roadways, waterways, airways and pipelines.

### Unit IV: Regionalisation of India

Region of India: D. Stamp, Desh Pandey ; Geographic region of India by R.L. Singh, Prakasha Rao & Ashok Mitra; .Economic & Planning Region of India: P. Sengupta, Economic region of India, Resources region of India, Development & Planning region of India.

1. Dixit K R, Rampriti K and Dixit J K (2014) North-East India: Land, People and Economy, Springer.



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2. Spate O H K (1979) India and Pakistan – A General and Regional Geography,  
Methuen and Co., London.

### **M.Sc. Geography Semester I**

#### **19 GEO 104 Statistical Methods in Geography**

**Objectives:** The course aims to provide understanding to the students about the nature and types of data; and to provide the basic understanding of application of statistical tools & technique for analyzing the Spatial Data.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Descriptive Statistics : Tools & Techniques**

Geography and statistics, significance of statistics in geographical studies. Descriptive statistics: tabulation and graphical representation of data. Measures of central tendency: mean, median and mode. Partitioned values: Quartiles and deciles. Comparing the mean, median and mode.

#### **Unit II: Measure of Dispersion**

Measure of dispersion: absolute measure; Range, quartile deviation, mean deviation and standard deviation. Relative measure of dispersion: coefficient of variation. Measures of inequality: location quotient and Lorenz curve.

#### **Unit III: Bivariate Analysis**

Bivariate analysis: scatter diagram, correlation analysis, Spearman's rank correlation and Karl Pearson's correlation coefficient. Test of significance: Chi-square test, student's T-test, F-test.

#### **Unit IV: Regression Analysis**

Simple linear regression model: regression equations, construction of regression line, computation of residuals and mapping. Basis of multivariate analysis: correlation matrix, partial and multiple correlations. Measure of composite Indices (Scale Biasness weightage, Z Score and Principal Component Analysis).

### **M.Sc. Geography Semester I**

#### **19 GEO 105 Cartography and Morphometric Analysis (Theory)**

**Objective:** The basic aim of this course is to provide basic understanding of Cartography, Thematic mapping & to provide the training for spatial Data Analysis.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.



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### **Unit I: Nature and Scope of Cartography**

Nature and scope of Cartography, Historical evolution, Development and Recent advancements in cartography, Types and characteristics of distribution maps:

(i) Chorochromatic (ii) Choroschematic (iii) Isopleth (iv) Choropleth (v) Dot and (vi) Diagrammatic.

### **Unit II: Statistical Diagrams & Their Classification**

Types and characteristics of statistical diagrams: (i) One dimensional (bar, line), (ii) Two dimensional (circular, rectangular, square), (iii) Three dimensional (block, sphere, cube) and (iv) Other diagrams (Snail, pyramid, flow diagram/cartogram). Characteristics of graph/diagrams/maps representing climatic data: (i) Rainfall deviation, (ii) Climograph (Taylor and Foster), (iii) Hythergraph, (iv) Star/Wind rose diagram (v) Isopleths (vi) Line and bar (vii) polygraph.

### **Unit III: Interpretation of Topographical Sheets**

Arrangement, identification and interpretation of topographical sheets of India; Delineation of drainage basin and its geographical significance; Profile: Transverse and longitudinal; Drainage network analysis: Linear and areal properties; Relationship between stream order, number and length.

### **Unit IV: Analysis of Drainage Basin**

Relief aspect of drainage basin: (i) area-height curve, (ii) Altimetric frequency curve, (iii) Hypsographic curve, (iv) Hypsometric integral curve and (v) Clinographic curve. Development of slope and various methods of its analysis (Wentworth and Smith's method).

## **M.Sc. Geography Semester I**

### **19 GEO 106 Cartography (Practical)**

**Objective:** The aim of the course is to apprise the students with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis, and to provide training in application of modern tools and techniques to data in a variety of regional studies at local, regional and national levels.

**Note:** The examiner shall set six questions, two from each unit. The candidate shall attempt three questions/exercises in all, selecting at least one question/exercise from each unit.

### **Unit I: Representation of Climatic Data**

Climate data representation by diagrams and maps:

- Line and bar graph (1)
- Poly graph (1)
- Rainfall deviation diagram (1)
- Climograph (Taylor and Foster's) (2)
- Hythergraph (1)
- Isopleth (1)
- Wind rose diagram (1)

### **Unit II: Graphical Representation of Socio-Economic Data**

Diagrams: Types and properties of diagrams representing socio-economic data:



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One dimensional diagram

Bar diagram: Simple bar (1),

Multiple bar (1),

Comparative bar (1)

Two dimensional diagrams – Pie diagram, Proportional circle (1).

Three dimensional diagrams – Sphere (1)

### **Unit III: Spatial Representation of Socio-Economic Data**

Distribution maps

- Dot method (1)

- Choropleth – monovariate (1) and bivariate (1)

Miscellaneous diagrams and graphs

- Trend graph (1)

- Age and Sex pyramid (1), Snail Diagram (1).

- Flow diagram, cartogram and accessibility maps (2).

### **M.Sc. Geography Semester I**

#### **19 GEO 107 Morphometric Analysis (Practical)**

**Objective:** The aim of the course is to apprise the students with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis, and to provide training in application of modern tools and techniques to data in a variety of regional studies at local, regional and national levels.

**Note:** The examiner shall set six questions, two from each unit. The candidate shall attempt three questions/exercises in all, selecting at least one question/exercise from each unit.

### **Unit I: Interpretation of Toposheets**

Interpretation of toposheets: (a) Physical features and (b) Cultural features (2)

Delineation of Watershed (All the exercises of morphometry shall be based on delineated watershed) (1)

Profile Analysis: Transverse and Longitudinal

a. Serial Profiles (1)

b. Superimposed Profiles (1)

c. Composite Profiles (1)

d. Projected Profiles (1)

e. Longitudinal or valley Thalweg Profile (1)

### **Unit II: Linear Aspects of Streams**

Linear Aspects of streams:

a. Relationship between stream order and stream Number (1)

b. Relationship between stream order and Average stream length (1)

c. Bifurcation ration (1)

Areal Aspects of streams:

a. Drainage Frequency (1)

b. Drainage Density (1)



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### **Unit III: Relief & Slope Aspect**

#### **Relief & Slope Aspect**

- a) Area Height Curve (1)
- b) Altimetric frequency curve (1)
- c) Hypsographic Curve (1)
- d) Hypsometric Integral Curve (1)
- e) Clinographic or clinometric curve (1)

#### **Slope Analysis**

- a) Wentworth's Method of Average Slope (1)
- b) G. H. Smith's Method of Relative Relief (1)

### **M.Sc. Geography Semester I**

#### **19 GEO 108 Academic Writing and Communication Skills**

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Internal Assessment will be a continuous evaluation process on the basis of the students' expression of effective communication skills through participation in activities like presentations, group-discussions, mock-interviews, etc.

#### **Unit I**

Human Communication, Verbal and Non Verbal Communication, Barriers to communication; the seven C's of effective communication. Preparing for interviews, CV/ Biodata, Group Discussion, Public Speaking, Mass Communication.

#### **Unit II**

Greeting and Introducing, Making Requests, Asking for and Giving Permission, Offering Help, Giving Instructions and Directions, Art of Small Talk, Participating in Conversations, Making a Short Formal Speech, Describing People, Places, Events and Things.

#### **Unit III**

Understanding Telephone Communication: Types of Calls, Handling Calls, Leaving a Message, Making Requests, Asking for and Giving Information, Giving Instructions, Agreeing and Disagreeing, Making or Changing Appointments, Reminding, Making Complaints and Handling Complaints, Telephone Etiquette.

#### **Unit IV**

Personality Development Skills: Personal Grooming; Assertiveness; Improving Self-Esteem; Significance of Critical Thinking; Confidence Building; SWOC analysis. Emotional intelligence: Recognizing and Managing Emotions and Situations; Stress and Anger Management; Positive Thinking; Developing Sense of Humour.

### **Semester-II**



## **M.Sc. Geography Semester II**

### **19 GEO 201 Geographical Thought**

**Objective:** The course aims to enlighten the students to the philosophical and methodological foundations of the subject and its place in the world of knowledge and to familiarize them with the major landmark development in geographical thoughts at different time periods and dualism in geography.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Geography in the Realm of Knowledge**

Place of Geography in the realm of knowledge, Geography as a science and its relationship with other science, Significance of space, place and location in geography. Explanations in Geography: Methodological and philosophical settings.

#### **Unit II: Evolution & Development of Geographical knowledge**

Development of Geographical knowledge during ancient (Greek and Roman) and medieval (Arab) periods, Foundation of Modern Geography- Varenus, Kant, Humboldt and Ritter.

#### **Unit III: Dualism in Geography**

Concepts of Modern Geography- chorology, landscapes, areal differentiation, environmental determinism and possibilism. Dualism in Geography: Physical vs Human Geography and Systematic v/s Regional Geography.

#### **Unit IV: Recent Trends & Post-Modernism Geography**

Quantitative Revolution and Emergence of theoretical geography, Positivist Explanations in Geography - Laws, theories, models, Inductive & deductive logic. Behavioural and Humanistic Perspectives in Geography, Social Relevance in Geography – Welfare, Radical and Feminist Perspectives, Postmodernism and Geography.

## **M.Sc. Geography Semester II**

### **19 GEO 202 Climatology**

**Objective:** The basic aim of this course is to foster comprehensive understanding of atmosphere, its evolution, characteristics, circulation and associated climatic phenomena, dynamics of global climates, recent climate change.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Nature & Scope of Climatology**

Climatology: Definition, nature and scope; Climatology and Meteorology. Atmosphere: composition and structure. Insolation: Solar radiation and terrestrial radiation, latitudinal and seasonal variations; Effects of atmosphere: green house effect, heat budget and latitudinal



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heat balance. Temperature: Processes of heat energy transfer, heating and cooling of atmosphere, horizontal and vertical distribution, inversion of temperature.

### **Unit II: Atmospheric Circulation**

Atmospheric pressure: measurement and its distribution pattern – vertical, horizontal and seasonal variations. General circulation: planetary, geostrophic, subtropical, westerlies and polar winds, tricellular meridional circulation, walker circulation-ENSO and La Nina; Circulation pattern in vertical and horizontal planes. Origin of monsoon and jet streams.

### **Unit III: Atmospheric Dynamic Process**

Atmospheric moisture: sources of atmospheric moisture; types and distribution of humidity and evaporation. Condensation: conditions, forms and types. Precipitation: process, form, types and distribution. Atmospheric equilibrium: stability and instability. Adiabatic process of temperature change, lapse rate: dry and wet adiabatic rate.

### **Unit IV: Climate Change & its Classification**

Air masses: definition, characteristics, modification and classification. Fronts: frontogenesis, frontolysis and classification. Atmospheric disturbances: extra tropical and tropical cyclones, their origin and associated weather, thunderstorms, tornadoes and waterspouts. Climatic classification: Bases of climatic classification by Koppen and Thornthwaite. Climatic changes – Evidences; Theories of Climate Change: - Milankovitch Cycle, Atmospheric Dust Hypothesis, Carbon Dioxide Theory and Astronomic Theory of Climate Change.

## **M.Sc. Geography Semester II**

### **19 GEO 203 Agricultural Geography**

**Objective:** The basic aim of this course is to provide fundamental understanding about concept, origin and development of agriculture; along with recent dynamics, contemporary issues and challenges faced by the agrigarian system and communities.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### **Unit I: Agricultural Geography: Definition, Nature & Scope**

Agricultural Geography: Definition, nature, scope and significance; Approaches: commodity, systematic, and regional; Origin and dispersal of agriculture; gene-centres of agriculture; Determinants of agricultural patterns: physical, technological and cultural factors.

### **Unit II: Concepts Classification of Land Capability**

Concepts of land capability classification (India), Land use survey and Classification (British and Indian), land use and cropping pattern; Agricultural concept and their measurement- (a) intensity of cropping, (b) degree of commercialization, (c) diversification and specialization, (d) agricultural efficiency and productivity, (e) crop combination and concentration; Von Thunen Model of agricultural land use.

### **Unit III: Concept of Agricultural Regionalisation**



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Agricultural Regionalisation: Concept and criteria, Whittlesey's agricultural systems; and agricultural typology by Kostrowiki; Agro-climatic zonation: Concept and agro-climatic regions of India. Agricultural regions of India, Regional imbalances in agricultural productivity in India. Green revolution: Its impact and consequences in India.

## **Unit IV: Contemporary Agriculture Issues & its Impacts**

Neo-liberalization and Indian agriculture; Food Security: Concept and components, Food Security in India; Contemporary Issues: Food, nutrition and hunger, food security, drought and food security, food aid programmes; environmental degradation, New Perspectives in Agriculture: Urban agriculture, Contract Farming, Agri-business, Sustainable Agricultural Development; Agriculture and climate change: Impacts and adaptation, role of irrigation.



## **M.Sc. Geography Semester II**

### **19 GEO 204 Population and Settlement Geography**

**Objective:** The basic aim of this course is to provide fundamental understanding about population, its distribution, structure and composition. Along with this course also provide an idea for settlement, evolution, types and its association with population geography.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Scope of Population Studies**

Evolution of Population Geography, Scope and content of population geography, Sources of data and Nature of data. World population distribution and growth with respect to stages of demographic transition. Population growth, distribution and trend with respect to India at sub-national level.

#### **Unit II: Population Structure**

Age-sex structure, Overall sex ratio, child sex ratio, sex ratio at birth, elderly sex ratio and their temporal trend and spatial pattern in India, Phenomenon of ageing population. Population Dynamics: Fertility, mortality and migration- Basic measures, spatial and temporal trends. Socio-cultural (Literacy and education, religious composition; rural-urban residence).

#### **Unit III: Settlement Geography**

Definition and Scope of settlement geography. Locational Aspects- Site, Situation, Characteristics (Size, Pattern, Shape, Functions), Distribution – Density, Spatial Distribution Pattern and Methods of Analysis of Distribution.

#### **Unit IV: Settlement Types and Functions**

Settlements Types based on Site, Situation, Population size and functions. Spatial and Temporal trends in size and growth of settlements with special reference to India, Functions of Settlements- Rural/ Urban Distribution. Empirical and theoretical models explaining the functional classification of towns & villages; functional classification of urban centres, functional typology of villages, functional landscape, functional structure of towns in India.

## **M.Sc. Geography Semester II**

### **19 GEO 205 Physical & Socio Economic Landscapes (Theory)**

**Objective:** The basic aim of the course is to provide theoretical background for conducting field Survey, its preparation & conduct field work for the understanding Physical & socio-economic landforms .

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.



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### **Unit I: Basic of Landscape Evolution**

Earth surface processes and associated landforms. Geomorphic structure, processes and landscape evolutions, dynamic equilibrium, and topographic response to tectonic activities and climatic forcing, morphogenetic region, Topographical and Terrain analysis with field mapping, analysis of remotely sensed data and numerical models.

### **Unit II: Landscape Mapping Analysis**

Landscape Analysis with Maps & Aerial Photos, Geomorphological mapping, Field mapping, Field surveying techniques. Identification of facies and genres of landforms, Stratigraphy, Sediment texture, structure, Particle morphology, Fabric analysis: General considerations; Clast macrofabrics and microstructural description, Clast mesofabrics and Laboratory analysis.

### **Unit III: Formation of Research Design**

Significance of Field work in Geography; Identification of Research Problem and Formulation of Research Design in geography; Types and Sources of Data: Characteristics of primary and secondary data; Types of Questionnaires and their formulation.

### **Unit IV: Research Design & Report Writing**

Selection of sample household; Preparation of field Questionnaire, Field sample survey design & preparation of Locational maps. Collection of demographic and socio-economic data from the field; Retrieval and analysis of data collected from field; Format of field project report writing; Data entry: coding and Tabulation, Planned report writing and Ethics of report writing.

## **M.Sc. Geography Semester II**

### **19 GEO 206 Project Report based on Physical Landscape (Practical)**

**Objectives:** The main objective of this course is to provide basic understanding about structure, landforms, their evolution & genesis and their association with the flora, fauna & human activities in the selected area.

**Note:** The report need to be supplemented with maps, sketches, photographs etc.

#### **Course Contents:**

1. Trace the prominent features of selected area. Identify salient landform and features of the selected area with the help of topographical sheet of survey of India.
2. Identify the earth surface processes actively operating in the study area. Trace the erosional and depositional landforms, their facies and genesis, stratiography, particle size analysis, morphology and clast fabric.
3. Identify and classify the biodiversity in the area (Flora & Fauna).
4. Observe the relationship of various landforms, flora and fauna with land use, settlement structure and life style of people.
5. Based on the results obtained from Geomorphological analysis based on various techniques. Prepare a field report with field photographs, sketches, maps and diagrams. Along with students have to submit their field diary.

## **M.Sc. Geography Semester II**



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## 19 GEO 207 Field Work Socio Economic (Practical)

**Objective:** Main objective of this course is to provide the students with the understanding of ground reality of a chosen village/town by observation; mapping of land quality, land use and cropping pattern and conducting Socio-economic survey of the households with the help of a specially prepared questionnaire.

### Course Contents:

1. Procure a topographic map of 1:50,000 or 1: 25,000 scale to study the settlements selected in its regional setting.
2. Collect demographic, social & economic data of the village/town from Census Reports to study the temporal changes in the profile of such characteristics.
3. Procure a cadastral map of the village/town for field mapping of the features of landuse and land quality. Procure/prepare the settlement-site map through rapid survey to map the residential, commercial, recreational (parks, playgrounds), educational, religious and other prominent features.
4. Conduct a socio-economic survey of the households with a structured questionnaire. Supplement the information by personal observations and perceptions.
5. Based on results of the land-use and socio-economic enquiry of the households, prepare a critical field-survey report. Photographs and sketches, in addition to maps and diagrams, may supplement the report.

## M.Sc. Geography Semester II

### 19 GEO 208 Fundamental of Information Technology

**Note:** There shall be nine questions in all. Question no. I shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### Unit I:

Basic Concept of IT, Data & Information, Characteristics of Information, Data Processing Introduction to Computers, Classification and Generation of Computer, Real-time Applications of Computer, Block Diagram and Anatomy of Computer, Input and Output Devices, Types of Software, Free and Open Source Software, Operating System, Types of Operating System, Function of Operating System, Features of Window OS

#### Unit II:

File Management: Desktop Components, Start Menu and Taskbar, Types of Icons, Viewing, Arranging, and Working with Files and Folders MS Word: Toolbars, Menu, Editing a Document, Previewing Document, Printing Documents, Mail Merge. MS Excel: Entering and Editing Worksheet Data, Worksheet Operations, Introducing Tables, Pivot Table, Charts and Graphics, Graphing and Summarizing Data; Statistical Processing of Data, Spreadsheet Formulas and Functions: Mathematical, Statistical and Financial Functions, Conditional Formatting; MS PowerPoint: PowerPoint Basics, Insert, Tools, Format, Slide Show, Formatting Slides, Create Presentations, Insert and Modify Text, Work with Graphics and Media



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## Unit III:

Social Media: Introduction to Class and Social Media, Measuring, Monitoring, and Analyzing Social Media Trends and Impact, Domains of Application in Social Media, Social Media Marketing Strategy; Mobile Communication: Fundamentals of Mobile Communication, 2G and 3G Technology, 3GPP LTE, GSM Evolution in GPRS and EDGE, Emerging Technologies for 4G; Data Communication: General Block Diagram of Communication System, Types of Communication, Applications of Data Communications, Digital Data Communication Techniques; Concept of Network, Types of Network, LAN Topologies, Computer Protocols

## Unit IV:

History of Internet, Intranet, Web Browsers, Search Engine, Working with Internet, Applications of Internet; E-Commerce: Evolution and Architecture of E-Commerce, Computer Application in Business; Computer Application in Various Field of Commerce: Accounting, Purchasing, Banking, Cost and Budget Management; Internet Payment Systems, Concept of Mobile Commerce; Multimedia, Concept of Multimedia & application of Multimedia

## M.Sc. Geography Semester II

### 19 GEO 209 General Geography of India (Open Elective)

**Objective:** The course aims to provide understanding to the students about the geographic dimensions of India in terms of its political and administrative characteristics. It also familiarize the students with the physical, climatic, human and economic dimensions of India in a spatial perspective.

**Note:** There will be seven questions in all. Question No. 1 is compulsory and consists of 4 subparts (short notes not exceeding 50 words each). Short notes shall cover entire syllabus. There will be 6 long questions, three from each unit. The candidate shall attempt THREE long questions, at least one from each unit. Question 1 carries 8 marks. Long questions carry 9 marks each.

## Unit I:

India: Locational Setting and Geographical Expansion.  
Relief and Drainage Systems.  
Climate, Soil and Natural Vegetation.  
Geographical Regions of India.

## Unit II:

Peoples of India.  
Population; Distribution, Density and Growth.  
Population Composition: Ethnic and Socio-cultural attributes (caste and tribes).  
Unity in Diversity in India.

## Unit III:

Agriculture: Production, Productivity and Yield of major crops.



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Major Crop Regions of India.

Agro-climate Zones of India.

## **Unit IV:**

Industrial Development since Independence.

Industrial Region and their characteristics.

Industrial Policy of India.



## **M.Sc. Geography Semester III**

### **19 GEO 301 Oceanography**

**Objective:** The course aims to introduce students to the many facets of Oceans, such as, evolution of the oceans, physical and chemical properties of sea water, atmospheric and oceanographic circulation, the fascinating world of marine life and the characteristic of marine environment and the impact of man on the marine environment.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Nature and Scope of Oceanography**

Definition, Nature and Scope of Oceanography; Distribution of Land and Water; Thermohaline Circulation and its association with the global climate, Origin of Ocean Basins.

#### **Unit II: Features of Ocean Basins**

Features of Ocean Basins; Continental Margins and Deep Oceanic Basins; Oceanic Floor Profile: Continental shelf, Slope, Ridge and Deeps, Abyssal Plains; Submarine Canyons; Coral reefs: Types, Origin and Distribution; Configuration of Ocean Floor of Indian, Atlantic and Pacific Ocean.

#### **Unit III: Ocean Currents and Dynamics**

Ocean Currents: origin, types and dynamics; Currents of Pacific, Atlantic, and Indian ocean; Impact of ocean currents; Climate change and ocean circulation, Physiochemical properties of sea water: Temperature, Density, Salinity and Dissolved Gases; Ocean movement: Waves, Tides; (Theory of Tides) and currents.

#### **Unit IV: Marine Resources and Environment**

Life in the Ocean: Bio zones; Types of Organism- Plankton, Nekton and Benthos; Ocean and livelihood; Oceans as Source of Food, Mineral and Energy Sources; Oceans Deposits; Sea Level Change: Evidences and Impacts; Sustainable marine environment.



## **M.Sc. Geography Semester III**

### **19 GEO 302 Urban Geography**

**Objective:** The objectives of the course are to understand the process of urbanization and origin, growth and classification of urban settlements with relevant theories and models. It also aims to relate urbanization process and the evolution of urban system and examine the contemporary urban issues.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Urban Geography: Nature, Scope & Concept**

Defining Urban, Urbanization and Urbanism; Urban Geography: Definition, nature and scope origin growth & stages of urban systems; (Conurbation, Megalopolis, etc.) Lewis Mumford & Griffith Taylor. Urban population characteristics, Urban systems in Ancient Civilization, Medieval and Modern India. Trend of Urbanization in World & India.

#### **Unit II: Interaction Between City & Surrounding Regions**

City and region; Spatial linkages (rural urban linkages) and interactions; Rural Urban fringe, Suburbanization; Spatial network framework - Central Place Theory: Christaller, Losch, Walter Isard; Size and spacing of cities: Rank Size Rule, Primate City; Functional classification of cities: concepts and scheme of classification.

#### **Unit III: Urban Land Use Models**

Urban Morphology and land use; Models of city structure: Concentric Zone model by E.W. Burgess, Sector model by Homer Hoyet, Multiple nuclei model by Harris and Ullman; Contemporary urban morphology in the wake of globalization – global city.

#### **Unit IV: Urban Environment & Planning**

Urbanisation in India: Patterns and Trends; Urban problems: Environmental issues, overcrowding, transportation and mobility; Urban Inequality: Urban Poverty, Slums & squatter housing, access to housing and amenities; Urban basic services; Quality of Urban Life; Urban Planning in India: National urban policy, Study of master plans of Delhi and Chandigarh; The Smart & sustainable cities.



## **M.Sc. Geography Semester III**

### **19 GEO 303 Fluvial Geomorphology**

**Objective:** The rivers being the major geomorphic agent of erosion, the course assumes significance as it mainly deals with an understanding of the fluvial forms and processes. The evolution of drainage pattern and alluvial channels are governed by the forces resisting and driving the flow of water. The students are introduced to the activities of these two forces and their resultant effects on the flow patterns, sediment load and channel patterns.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Basic Concepts of Fluvial Geomorphology**

Basic concept of Fluvial Geomorphology and Geography; hydrological cycle and subcycle; drainage pattern evolution; limits of drainage development; channel changes with time.

#### **Unit II: Fluvial Morphology and River Profile**

Fundamentals of river mechanics: types of flow and flow discrimination; forces acting in channels; Low regimes; sediment load of streams. sediment transport; competent velocity; lift force; critical tractive force, Hydraulic geometry of streams at a station and down-stream; channel thalweg; causes of concavity; channel patterns, equilibrium profile - straight, meandering and braided.

#### **Unit III: Process: Basin Morphology**

Drainage basin as a fundamental geomorphic unit. Drainage basin - form and process; drainage basin morphometry; morphometric interrelations.

#### **Unit IV: Applied Fluvial Geomorphology**

Applied fluvial geomorphology; human adjustment to flood plain, alluvial fans and deltaic environments (case studies). Effects of reservoirs on fluvial systems. Remote sensing and GIS application to fluvial environments.

## **M.Sc. Geography Semester III**

### **19 GEO 304 Political Geography**

**Objective:** This course aims to expose the students to the strategic importance of geographical parameters in the Political Science at global, regional and local level, to sensitize the students to geopolitical dimensions and the understanding of conflicts and regional cooperation and to make them familiar with the international geopolitics.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Concepts and Contribution in Political Geography**



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Ideas in Political Geography, Geography and its relationship with political economy and political sociology. Theoretical contributions to political geography: Ratzel, Hartshorne, Taylor and Harvey.

### **Unit II: Political Geography of Ocean**

Political Geography of Ocean: Maritime Boundaries, delimitations: principles and problems, international law of the sea. UNCLOS III, Theories of international trade and economic zones and organizations, role of WTO in international geopolitics.

### **Unit III: Theories and Models of Geopolitics**

Geo-strategic views: Mahan, Mackinder, Spikeman, conflict between states and conflict resolutions, supranational organisations and their geographical significance. Political Geography of the world order: Theories of international systems, evolution of contemporary world order, alternate models of development for the future.

### **Unit IV: Administrative Organization of Space**

Administrative organisation of space: Methods of administrative organisation, territory: Electoral Geography: electoral systems, methods of studying electoral geography, geographical influence in voting; public administrations and landscape formation, polity as an agent of landscape change.

## **M.Sc. Geography Semester III**

### **19 GEO 305 Environmental Geography**

**Objective:** This course aims to provide the understanding about the importance of biodiversity to maintain ecological balance and various environmental issues at national and international level.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### **Unit I: Nature and Scope**

Scope of Environment Geography, Basic Principles of Environmental Geography: Composition and types of Environment, Ecological Principles, Man – Environment relationship, Restoration of Ecology.

### **Unit II: Ecosystem**

Ecosystem: Concept and components, Trophic levels, Food chains and food webs, Energy flow in the ecosystem, Ecosystem stability, high land – low land interactive system, human ecological adaptation.

### **Unit III: Concepts of Ecosystem**

Concept of ecosystem, Environmental Degradation, Environmental Pollution (Air, Water and Solid Waste), Ganga Pollution & Ganga action Plan, Environmental Problems – Global Warming, Ozone Depletion and Green house effects, transformation of nature by man, global ecological imbalances, wetland ecosystem with reference to Haryana.



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### **Unit IV: Environmental Management and Planning**

Environmental Management: Concept and approaches: Ecosystem Management Strategies, Environmental Dimension in Planning – Sustainable Development, Eco- Development, Limits to growth, Environmental Consciousness, National Environmental Policies and Programmes, Environmental Impact assessment, Rio Summit, Kyoto Protocol & Carbon Trading, Paris climate summit and environmental footprints.

### **M.Sc. Geography Semester III**

#### **19 GEO 306 Aeolian Geomorphology**

**Objective:** Aeolian environments are particularly sensitive to aridity, bio-mass and human interferences. All these activities affect wind shear in different degrees, set time in motion the processes of erosion and deposition. These processes and their resulting forms are highlighted in the course content. A direction is set for the application of aeolian geomorphic principles for the efficient management of land-based human economic activities through advanced monitoring technique with special reference to India.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Aeolian Processes**

Wind environment: introduction; desert wind systems; directional variability and resultant, Drift potential; scope of aeolian geomorphology. Grain in motion: fluid flows –flow types; interaction of the wind and the bed-wind shear; entrainment-lift and drag: Thresholds of movement: static and dynamic; modes of transport saltation, creep, reputation and suspension; transport rates.

#### **Unit II: Aeolian Landforms**

Wind erosion and landforms: processes: abrasion, deflation and aerodynamic erosion; landforms; yardangs, ventifacts, pans, stone pavements, deflation hollows, desert varnish: processes and significance. Dusts-sources; -contemporary and proximal, mineral composition; dust-generating and dust yielding systems, gross spatial patterns of production and removal; deposition; loess, types, palaeo-environmental significance.

#### **Unit III: Depositional Processes and Palaeo Environment**

Forms of wind deposition: sand ripples, obstacle dunes; dune- classification schemes; morphodynamics of the crescentic, longitudinal and complex dunes. Palaeo—environments: Introduction; sediment movement in the past; relic and active dunes; dating aeolian deposits; pre-leistocene sand dunes; Pleistocene and Holocene dunes; Aeolinites - composition and distribution.

#### **Unit IV: Applied Aeolian Geomorphology**

Applied Aeolian Geomorphology: Introduction; wind erosion on agricultural fields; controls of dust; Management of coastal dunes and dunes in semi -arid areas; desertification and its controls with special reference to India. Remote sensing and GIS applications in aeolian settings.



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## **M.Sc. Geography Semester III**

### **19 GEO 307 Social Geography**

**Objective:** This course aims to familiarize the students with the understanding of the society through concepts and social theories, philosophical approaches and spatial processes, social distortion and various components of social well-being in India.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Nature and Scope of Social Geography**

Nature and Scope of Social Geography; Developments in the field of social geography; Concepts in social geography: social differentiation, region formation, social evolution, social change & transformation, social space, social and spatial justice, ethnicity, social wellbeing.

#### **Unit II: Elements of Socio-cultural Regionalism**

Socio-cultural formation of society in India; Geography and caste: regional/spatial framework of dominant caste and land inequality, social and spatial segregation/exclusion, regional/cultural forms of untouchability in India- continuity and change; tribes and geographical isolation, tribe as a social formation: scheduled tribes and scheduled areas; regional studies of the major and minor tribes in India.

#### **Unit III: Linguistic Dimensions**

Language and dialect, language families, India as a linguistic area, linguistic diversity in India, Greenberg's linguistic diversity index, Mother tongue, Bi-lingualism, multi-lingualism, language shifts and retention, linguistic regionalism and minority languages; space and religion: religious diversity in India, religious minorities, communalism and space.

#### **Unit IV: Social Transformation**

Social Change and transformation in India: Modernization, role of rural urban interaction, problems of social transformation, social wellbeing- overview of concept; social and ethnic diversity of India and national integration: cultural pluralism and development.

## **M.Sc. Geography Semester III**

### **19 GEO 308 Geography & Disaster Management**

**Objective:** This basic aim of this course is to provide the theoretical understanding of various disasters, their origin, management and mitigation. Along with this course will also provide understanding for vulnerability and developing community resilience.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Geographical Setup of India and Regional Hazard Risks**



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Regional physiography, geology, soils, drainage, climate, land use and land cover of India, and natural hazards risk prone areas. Hazard risk, vulnerability and disaster: concepts and relationships; measuring hazard risks, vulnerability and disasters.

## **Unit II: Disaster Extremes in India & Their Impact**

Regional extreme events in India: earthquakes, floods, drought, cyclone, tsunami, landslides, avalanches, snow, rain, and wind storms. Disaster magnitude and impacts: case study/ examples from recent disasters.

## **Unit III: Regional Patterns of Disaster & Vulnerability in India**

Earthquake disaster vulnerability assessment (case study of metropolitan and other major cities). Flood disaster zonation and vulnerability assessment (case study of Brahmaputra and Ganga river systems). Landslides and avalanches disaster zonation and mapping (case study of Himalayas and north east region). Drought disasters zonation and mapping. Multi hazard risk assessment.

## **Unit IV: Disaster Management and Response System**

Understanding manmade disasters, fires and forest fires; nuclear, biological and chemical disaster, road accident and building collapses. Regional capacity, preparedness and response; governance and institutions for disaster management; awareness among people, capacity building, state disaster management plan.



## **M.Sc. Geography Semester III**

### **19 GEO 309 Fundamentals of Remote Sensing (Theory)**

**Objective:** The aim of this course is to:

1. Disseminate basic concepts and applications of Electromagnetic Spectrum in Remote Sensing, Energy Balance and Data acquisition platforms, sensors and their characteristics.
2. Enhance student's knowledge about optical, thermal and microwaves based Remote Sensing and Applications for solving real life problems.
3. Introduce students to digital image processing tools and techniques.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Remote Sensing**

Remote Sensing: History, Development, Definition, Concept & Principles, Electromagnetic Radiation (EMR) and Its Characteristics, Wavelength Regions and their Significance, Interaction of EMR with Atmosphere and Earth's Surface: Absorption, Reflectance and Scattering, Atmospheric Windows, Energy Balance Equation.

#### **Unit II: Imaging and Non-Imaging**

Imaging and Non-Imaging, Active and Passive, Multispectral, Superspectral and Hyperspectral Sensors, Electro-Optical Systems, Opto-Mechanical Scanners, Infrared Scanners, Scatterometer, Thermal Properties of Terrain, Thermal IR Environmental Considerations, Thermal Infrared and Thermal Scanners, Microwave Remote sensing concepts: Backscattering, Range Direction, Azimuth Direction, Incident Angle, Depression Angle, Polarization, Dielectric Properties, Surface Roughness and Interpretation, Speckle and Its Reduction, Applications of optical, thermal and microwave remote sensing.

#### **Unit III: Concepts about Digital Image**

Concepts about digital image and its characteristics, Sources of image degradation - Image restoration and Noise Abatement, Radiometric and Geometric correction technique, linear and non linear transformation for geometric corrections, Look-up Tables (LUT) and Types of image displays and FCC, Radiometric enhancement techniques, Spatial enhancement techniques, Contrast stretching: Linear and non-linear methods, Low Pass Filtering: Image smoothing, High Pass Filtering: Edge enhancement and Edge detection, Gradient filters, Directional and non-directional filtering.

#### **Unit IV: Concept of Pattern Recognition**

Concept of Pattern Recognition, Multi-spectral pattern recognition, Spectral discrimination, Signature bank, Parametric and Non-Parametric classifiers, Unsupervised classification methods, Supervised classification techniques, Limitations of standard classifiers.



### **M.Sc. Geography Semester III**

#### **19 GEO 310 Lab work on Aerial Photographs & Satellite Images (Practical)**

**Objective:** This course aims to make the student learn practical aspects related to:

1. Usage of diverse remote sensing data for extracting needed geo-spatial information.
2. Execution of various analogue and digital information extraction techniques, both manually and using computers.

**Note:** The examiner shall set four questions, two from each unit. The candidate shall attempt three questions in all, selecting at least one question/exercise from each unit.

#### **LAB EXERCISES**

- Understanding Remote Sensing Data and Visual Interpretation
- Import / Export of Satellite Data, Display, Analysis, and Digital interpretation of earth surface features in Standard FCC
- Radiometric and atmospheric corrections
- Geo-referencing and Geo-coding
- Field Spectra Collection: vegetation, bare soil, and concrete using Spectro Radiometer
- Analysis of satellite derived spectral response and field spectra
- Study of the various contrast enhancement techniques
- Spectral Enhancement (Ratio images and PCA) Techniques
- Spatial Enhancement: Low Pass Filtering & High Pass Filtering Techniques
- Unsupervised Classification
- Supervised Classification & Accuracy Evaluation
- Advance Classification

### **M.Sc. Geography Semester III**

#### **19 GEO 311 Remote Sensing Project Report (Practical)**

**Objective:** This course aims to familiarize and enhance the student's knowledge about the Remote Sensing and GIS techniques along with their application value in the Earth observation. And enable them to write the project report based on application of remote sensing.

**Note:** Student has to submit a Remote Sensing Project Report individually on the approved topic by the department from the following themes. Report should be of minimum 50 pages as per the Performa decided by the department.

#### **Themes for the Remote Sensing Project Report:**

- Land Use Land Cover (LULC)
- Agriculture, Crop Combination & Pattern
- Transport Network Analysis at micro-level
- Urban Land use, Land Cover and Planning



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- Deforestation and Land degradation
- Land degradation and desertification
- Water Management
- Hotspot Analysis
- Planning for smart cities
- Micro climate of Urban areas
- Infrastructure development and planning
- Mining and environmental degradation
- Snow cover and glacial mapping
- Hydrological and Runoff Modelling

## Outline for Project Report:

Student has to submit a report based on the analysis of remotely sensed data and field observations as mentioned:

- Statement of the problem
- Research Objectives
- Database
- Research Methodology
- Analysis of Data
- Discussion and Research Findings
- References
- Annexure and Additional Data

## M.Sc. Geography Semester III

### 19 GEO 312 Basic of Climatology (Open Elective Course)

**Objective:** The overall objective of the course is to foster comprehensive understanding of atmospheric phenomena; dynamics and global climates.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### Unit I:

Definition of weather and climate; Climatology and Meteorology; Origin, composition and structure of atmosphere; Solar radiation, greenhouse effect, heat budget and temperature distribution.

#### Unit II:

Atmospheric pressure and its distribution pattern; Theories of general circulation and planetary winds; Walker circulation- ENSO and La Nina, origin of monsoons and jet streams.

#### Unit III:

Atmospheric Moisture: humidity, evaporation, condensation; precipitation formation theories and types of precipitation, acid rain; Stability and instability of atmosphere, air masses and



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## Unit IV:

Weather systems: Origin and characteristics of extra tropical and tropical cyclones; Climatic change: pattern, evidences and theories of climate change; Global warming and its impacts on earth systems.

## M.Sc. Geography Semester IV

### 19 GEO 401 Regional Developments and Planning

**Objective:** The basic aim of this course is to provide the theoretical foundations and conceptual framework for the regional development process. It also sensitizes the students about the changes taking place in regional structure of Indian economy, about the concept of region in Geography and the regional development and planning process in India.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### Unit I: Concepts of Regional Development

Concept of regional development, concept of region, classification of region and method of region delineation, types of planning region; concept of regional planning and development.

### Unit II: Developmental Models and Theories

Development Theories: Trickle-down Theory (Hirschman), Growth Pole Model (Parroux), Cumulative causation model (Myrdal), Core-Periphery Theory (Friedman); Recent Divergence and convergence theories: Kuznets curve, Dependency theory, bio-regionalism, Eco-feminism, Deep ecology, sustainable development.

### Unit III: Planning Region

Planning Region: Characteristics and need; Planning Process- Sectoral, Temporal and Spatial dimensions; Short-term and Long-term Perspective of Planning; Planning for a Region's development and Multi-regional planning in National Context; sectoral-spatial development with special reference to agricultural and industrial development in India; decentralization and development; State, civil society and market in the Neo-liberal economic framework; Globalization.

### Unit IV: Regional Planning: Policy and Strategies

Regional Planning in India: Regional Imbalances/Disparities- Causes and Consequences; Measurements of Regional Disparities; Planning Policies for Regional Development; National Capital Region, study of regional development planning and programmes: Backward area development, Tribal area development, Hilly area development, Arid/Desert area development, flood and drought prone areas development and coastal area development.

## M.Sc. Geography Semester IV

### 19 GEO 402 Geography of Haryana

**Objective:** The basic aim of this course is to introduce the students with the glorious past of



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the state of Haryana, its Physiography, Climate, People, Society, resource base and Economic structure.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

## Unit I: Haryana: An Introduction

Haryana: Physiography: Relief characteristics and physiographical divisions, Drainage systems and their significance, Chronology and Palaeo Channel of Sarasvati River and its association with Vedic Civilisation, Climatic regions of state, Soil and vegetation, forest regions, characteristics and conservation.

## Unit II: People and Society

History of the State, Vedic Civilisation, Geography of Vedas & Puranas Growth of Population, distribution of Demographic attributes: sex-ratio, literacy rate and work force participation. Population problems and policies, Human Resources: Potential and Prospects, Contemporary issues related to gender Ratio and women empowerment.

## Unit III: Agriculture

Agriculture: Agro-climatic Region, Traditional agriculture system, Cropping Pattern, Green Revolution and Agricultural development in Haryana and problems related to agriculture. Irrigation: Types of irrigation, Major irrigation projects: Bhakra Nangal, Agriculture Potential and Management, Prospects and Potential of Agro-processing Industries, Storage and Marketing of Agriculture Products, Contemporary issues related to agriculture and farmer sustainability.

## Unit IV: Resource and Economy

Trend and Pattern of Urbanisation, Contemporary Issues and Challenges in Urban Areas, Distribution of Natural and Human Resources, Transport System and Growth, Manufacturing and Service hubs, knowledge economy Any Case Study of Automobile and Information and Technology Hub

## M.Sc. Geography Semester IV

### 19 GEO 403 Cultural Geography

**Objective:** This course aims to understand diversity of cultures in the world as well as in India, to comprehend the diffusion of various ethnic traits and religions and to understand the relationship between cultures and pattern of living and economic development.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

## Unit I: Nature and Scope of Cultural Geography



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Introduction: Nature and scope of cultural geography; Definition, cultural element and components of culture; convergence and divergence processes; cultural changes: perception, behaviouralism and cultural relativism.

## Unit II: Cultural Diversity

Cultural Diversity: Bases of cultural diversity-race, religion and language. Cultural diversity in the world, cultural diversity and regionalization in India. Geography of ethnic groups and tribal groups. Religion and its diffusion; diffusion of ethnic traits in world as well as in India; ethnic landscape and economy of the area; Diffusion in folk geography; cultural landscape and cultural ecology in folk Geography; Religion: origin, diffusion and spatial distribution.

## Unit III: Patterns of Livelihood

Patterns of livelihood: various economic activities & cultural adaptations; agriculture, industrialization and modernization; technological changes and their geographical implications.

## Unit IV: Human Settlements Pattern

Human settlements: Relation to ideology, social structure and technology, social structure and technology, pattern of rural & urban society, social processes in the city, the city in the developing countries.

## M.Sc. Geography Semester IV

### 19 GEO 404 Biogeography

**Objective:** This course aims to introduce the students the concept of Biogeography and its, interpretation. Information and their application; interaction between living organisms with climate and physical environment, with special reference to India.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

## Unit I: Significance of Biogeography

Nature, scope and significance of biogeography, Basic ecological principles: Bio-energy cycles in territorial ecosystem (Carbon and Nitrogen), energy flow, trophic levels and food web, Origin of fauna and flora.

## Unit II: Biomes of the World

Major biomes of the world: forests, grasslands and deserts, Distribution of plant life on the earth and its relation to soil, climate and human activities, Geographical distribution of animals on the earth and its relation to vegetation types, climate and human activities.

## Unit III: Communities and Ecosystems

Communities: Nature of communities and ecosystems: bio-diversities; human induced community change; habitat decay and conservation of biotic resources, Ecosystem services and its significance.

## Unit IV: Environmental Hazards and Ecological Consequences



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Environmental hazards, Ecological consequences, human perception and adjustment with respect to flood, drought and earthquake, Bio-Reserves of India, National forest and wild life policy of India.

## **M.Sc. Geography Semester IV**

### **19 GEO 405 Geography of Health**

**Objective:** This course aims to provide the understanding about the perspectives on health, its relation with development and global environmental change.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### **Unit I: Perspectives on Health**

Perspectives on Health: Definitions; linking environment, development and health; driving forces in health and environmental trends- population dynamics, urbanization, poverty and inequality, science and technology and life styles. Pressure on Environmental Quality and Health: Human activities and environmental pressure- land use and agricultural development; industrialization; transport and energy.

#### **Unit II: Exposure and Health Risks**

Exposure and Health Risks: Air pollution; household wastes; water; housing; workplace; global environment change; multiple challenges for health protection. Health and Disease in Environmental Context with special reference to India: Estimating the burden of disease- acute respiratory infections, diarrhoeal diseases , tropical vector-borne and newly emerging diseases, injuries and poisoning; mental health conditions, cardiovascular diseases and cancer.

#### **Unit III: Climate Change and Human Health**

Climate Change and Human Health: Changes in climate system - heat, cold and air pollution; extreme weather events; sea level fluctuation; ozone depletion; effects on biological disease agents; food production and nutrition.

#### **Unit IV: Linkage Methods for Environment, Development and Health Analysis**

Linkage Methods for Environment, Development and Health Analysis: Approaches to linkage analysis; health and environmental analysis for decision making; development of environmental health indicators; assessment of health effects. Promotion of environmentally sound healthy settings in India: Districts; cities, neighborhoods, institutions, markets.

## **M.Sc. Geography Semester IV**

### **19 Geo 406 Glacial and Periglacial Geomorphology**

**Objective:** This course aims to provide in-depth understanding about glaciations and related morphological processes on the earth surface.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of



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eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### **Unit I: Ice Ages and World Glaciations**

Ice Ages and World Glaciations: Causes of Ice Ages-Pleistocene Glaciation: onset and retreat, direct and indirect effects of Pleistocene Glaciation-glacier regimes: definition, mass balance and response to climatic changes-glacier ice: physical and thermal properties, glacier flow and internal deformation.

### **Unit II: Erosional Process**

Erosional Process: glacial erosion: ice and melt water-mechanical and chemical processes of erosion; development of erosional landforms-morphodynamics of the features of erosion at or inside glacier margins-glacial thermofrost; superglacial, englacial, and basal.

### **Unit III: Depositional Process**

Depositional Process: Processes-stratified and non-stratified; drifts-morphodynamics of moraines: forms of moraines-glaciofluvial and glacio-lacustrine environment; Pleistocene glaciation in South Asia-Hazards in glacial environment: glacial surges and glacier dam bursts.

### **Unit IV: Periglacial Processes: Frozen Ground Phenomenon**

Periglacial Processes: frozen ground phenomenon: identification, depth variations, thermal properties, classification and distribution-ground ice: types and morphodynamics of periglacial processes: mechanism of frost action, mass wasting, nivation. Periglacial landforms; frost actions and landforms-mass wasting and landforms adaptation of human beings to periglacial environment.

## **M.Sc. Geography Semester IV**

### **19 GEO 407 Settlement Geography**

**Objective:** This course aims to provide the understanding about historical development, patterns, types of settlement system in India and world.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### **Unit I: Evolution, Size and Growth**

Evolution, size and growth of human settlements: Theories of evolution of settlements; size, distribution, spatial and temporal trends in size and growth of settlements. Distribution Pattern: Spatial distribution pattern of settlements: Theoretical models and empirical findings.

### **Unit II: Settlement Structure**

Settlement Structure: Physical (characteristics of internal structure and external form, theories explaining internal morphological structure of cities; empirical and theoretical models explaining the functional classification of towns & villages; functional classification of urban centres, functional typology of villages, functions and scope, functional structure of towns in



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India. Land use (principles and theories of land use in urban and rural setting: house types and building materials, environmental, socio-economic/cultural factors influencing the dynamics of settlement structure.

## **Unit III: Settlement Hierarchy**

Settlement Hierarchy: theories of Christaller and Losch and their application to settlement hierarchy, factors contributing to hierarchy, Central Place theory: measurement of centrality and hierarchy. Hierarchy of settlements in India – an empirical exercise. Issues, perspectives and policies on Population and Human Settlements. Interface between human settlements and environment.

## **Unit IV: Issues, Perspectives & Policies on Population**

Issues, perspectives and policies on Population and Human Settlements. Interface between human settlements and environment.



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## M.Sc. Geography Semester IV

### 19 GEO 408 Transport Geography

**Objective:** The basic aim of this course is to provide basic understanding about the development of Transport Network and its spatial linkages and Network Analysis.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### Unit I: Spatial Interaction & Transport

Transport for spatial interaction: Spatial interaction and time-space convergence, enlarging the catmint area of markets, dynamic relationship between transport and spatial readjustment-  
--Role of transport as a lead sector.

#### Unit II: Network Analysis

Problem of accessibility: The transport network; Network shape and location; Regional variations in its density; Methods of measurement, transport and spatial processes; Traffic flow and regional interaction.

#### Unit III: Network Efficiency

Graph theory and Network Geometry; Concept of topology, topological measurement of network efficiency. Urban Transport: Profile of urban transport facilities; Traffic in towns; Transport services and urban land use pattern, role of intermediary transport modes; modal split.

#### Unit IV: Transport Planning

Regional Transport Planning: The framework of regional transport Planning traffic generation; methods of forecasting; zonal interchange of traffic; mode and route assignment methods. Indian Transport: Transport development during colonial and plan periods; transport and regional structure of Indian Economy.

## M.Sc. Geography Semester IV

### 19 GEO 409 Principal of GIS and Navigation System (Theory)

**Objective:** This course aims to familiarize and enhance the student's knowledge about the Remote Sensing and GIS techniques along with their application value in the Earth observation.

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

#### Unit I: GIS Basic

GIS: Definition and Applications; Components and Elements of GIS; Development of GIS technology; Geographic objects: point, line and area; analog and digital maps; theoretical models and framework for GIS, representation of geographic data-bases, computer systems and map projections.



# CH. BANSI LAL GOVERNMENT COLLEGE FOR WOMEN

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Affiliated to CBLU Bhiwani Recognised u/s 2(f) of UGC Act

Ph. : 01253-297062

AISHE Code : C-28470

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Ref. No. ....

Dated .....

vector and raster based models; data input devices: Digitization; external data bases; storage and manipulation of GIS data bases.

## Unit III: Spatial Analysis

GIS and Spatial Analysis: Neighbourhood analysis; Proximity analysis and buffers; Overlays Analysis – raster and vector based overlay and their applications; Presentation of GIS output.

## Unit IV: GNSS

Different GNSS Systems in Operation; How a GNSS system works; Sources of error in a GNSS system, Introduction to GIS: Concepts of Projection, datum and spheroid, mean sea level, orthometric height, Geoid models; Formats of storing GIS Data, Geographical Mapping with hand-held GPS, data downloading and visualization, import GPS data in Google Earth.

## M.Sc. Geography Semester IV

### 19 GEO 410 Principal of GIS and Navigation System (Practical)

**Objective:** This course aims to familiarize and enhance the student's knowledge about the Remote Sensing and GIS techniques along with their application value in the Earth observation.

**Note:** The examiner shall set six questions, two from each unit. The candidate shall attempt three questions selecting at least one question/exercise from each unit.

### Unit- 1: Map Elements

Map elements: scale, projection, coordinate systems

Introduction to GIS software (open source)

Data inputs scanning/acquiring data

Georeferencing a raster layer with GPS Points and an existing georeferenced layer, Defining projection, re-project from one projection to another

### Unit II: Digitisation

Creating Vector layers through on-screen digitisation- Point, Line, Polygon, Creating Attribute Table: Add Fields for different data types, Joining and relating tables.

Simple query building

Topology: error detection and correction

### Unit III: Data Visualization

Data visualization, map layout design and symbology

Raster data manipulation: Resampling, Mathematical operations using raster layers (Case Studies: Forest Planning for Sensitive Wildlife Species, Population mapping and modelling, Delineation of Watersheds etc.)

## M.Sc. Geography Semester-IV

### 19 GEO 411 GIS Project Report (Practical)

**Objective:** This course aims to familiarize and enhance the student's knowledge about the Remote Sensing and GIS techniques along with their application value in the Earth observation and enable them to write the project report based on application of remote sensing.



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department.

## Themes for the GIS Project Report:

- Land Use Land Cover (LULC)
- Agriculture, Crop Combination & Pattern
- Transport Network Analysis at micro-level
- Urban Land use, Land Cover and Planning
- Deforestation and Land degradation
- Land degradation and desertification
- Water Management
- Hotspot Analysis
- Planning for smart cities
- Micro climate of Urban areas
- Infrastructure development and planning
- Mining and environmental degradation
- Snow cover and glacial mapping
- Hydrological and Runoff Modelling

## Outline for Project Report:

Student has to submit a report based on the analysis of remotely sensed data and field observations as mentioned:

- Statement of the problem
- Research Objectives
- Database
- Research Methodology
- Analysis of Data
- Discussion and Research Findings
- References
- Annexure and Additional Data

## M.Sc. Geography Semester IV

### 19 GEO 412 General Geography of World (Open Elective Course)

**Note:** There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

### Unit I:

Continents and Oceans: Their location, expansion and geographical characteristics. World Major Physiographic Units: Mountain, Plains and Plateaus.

### Unit II:

World Climates and Major Climatic Regions Major  
Salt Water and Natural Resources Page 72 of



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Human Biological Diversity, Ethnicity and Distribution of Races Major  
Religions of World and their Distribution.

## **Unit IV:**

Population: Distribution, Density and Growth

World Economy: Characteristics of Developed and developing Economics.