# COURSE OUTCOMES (COs)

Table of Contents

# 1. B.A (H) ECONOMICS

## 1.1 Core Courses

### HC11 – Mathematical Methods for Economics I

- The course hones and upgrades the mathematical skills acquired in school and paves the way for the second semester course Mathematical Methods in Economics II. Collectively, the two papers provide the mathematical foundations necessary for further study of a variety of disciplines including economics, statistics, computer science, finance and data analytics.
- The analytical tools introduced in this course have applications wherever optimisation techniques are used in business decision-making.
- These tools are necessary for anyone seeking employment as an analyst in the corporate world.
- The course additionally makes the student more logical in making or refuting arguments.

### HC12 – Introductory Microeconomics

- The course introduces the students to the first course in economics from the perspective of individual decision making as consumers and producers.
- The students learn some basic principles of microeconomics.
- They are also exposed to interactions of supply and demand, and characteristics of perfect and imperfect markets.
- It will also illustrate how microeconomic concepts can be applied to analyse real-life situations.

### HC21 – Mathematical Methods for Economics II

- The course provides the mathematical foundations necessary for further study of a variety of disciplines including postgraduate economics, statistics, computer science, finance and data analytics.
- The analytical tools introduced in this course have applications wherever optimization techniques are used in business decision-making for managers and entrepreneurs alike.
- In this course, particular economic models are used for illustrating the method of applying mathematical techniques to economic theory in general.
- These tools are necessary for anyone seeking employment as an analyst in the corporate world.

### HC22 – Introductory Macroeconomics

- This course aims to develop the broad conceptual frameworks which will enable students to understand and comment upon real economic issues like inflation, money supply, GDP and their interlinkages.
- It discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variables.

- It also introduces students to simple analytical frameworks (e.g., the IS-LM model) for determination of equilibrium output.
- It will also allow them to critically evaluate various macroeconomic policies in terms of a coherent logical structure.

### HC31 – Intermediate Microeconomics I

- The course trains the students of Economics about the basic elements of consumer theory and production theory
- It also covers the behaviour of consumers and producers in functioning of perfectly competitive market.
- It is designed to provide a sound training in microeconomic theory to formally analyse the behaviour of individual agents.
- This course aims to give students a solid grasp of microeconomic analysis at the intermediate-level using mathematical techniques where appropriate.

### HC32 – Intermediate Macroeconomics I

- This course enables students to analyse the macroeconomic performance of various countries using formal analytical tools.
- It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context.
- It also introduces students to various micro-founded theories of macro behaviour, e.g., consumption and investment behaviour of households and the demand for money generated in the household sector.
- It also allows them to evaluate important macroeconomic policies and their implications.

### HC33 – Statistical Methods for Economics

- At the end of the course, the student should understand the concept of random variables and be familiar with some commonly used discrete and continuous distributions of random variables.
- They will be able to estimate population parameters based on random samples and test hypotheses about these parameters.
- It sets a necessary foundation for the econometrics courses within the Honours Programme and familiarity with probability theory will also be valuable for courses in advanced microeconomic theory.
- An important learning outcome of the course will be the capacity to analyse statistics in everyday life to distinguish systematic differences among populations from those that result from random sampling.

### HC41 – Intermediate Microeconomics II

- This course helps the students to understand efficiency of markets and the environment where the standard market mechanism fails to generate the desirable outcomes.

- The issues of market imperfection and market failures are important building blocks of this course.
- The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning.
- It covers general equilibrium and welfare, imperfect markets and topics under information economics.

### HC42 – Intermediate Macroeconomics II

- This course will enable students to combine their knowledge of the working of the macroeconomy with long run economic phenomena like economic growth, technological progress, R&D and innovation.
- It will also enable students to understand business cycles and the concomitant role of policies.
- This course also provides insights into modern business cycle analysis.
- It introduces students to open economy macro issues and provides a long run perspective to policy-making by framing policies in a dynamic context.

### HC43 – Introductory Econometrics

- Students will learn to estimate linear models using ordinary least squares and make inferences about population parameters.
- They will also understand the biases created through mis-specified models, such as those that occur when variables are omitted.
- The course is designed to provide the students with the basic quantitative techniques needed to undertake applied research projects.
- It also provides the base for more advanced optional courses in econometrics.

### HC51 – Indian Economy I

- Using appropriate analytical frameworks, this course reviews major trends in economic indicators in post-independence India.
- It also focuses on the policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points.
- At the end of the course, a student should be able to understand the development paradigm adopted in India since independence.
- Evaluate its impact on economic as well as social indicators of progress and well-being.

### HC52 – Development Economics I

- The course begins with a discussion of alternative conceptions of development and their justification.
- It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models.
- This course introduces students to the basics of development economics, with in-depth discussions of the concepts of development, growth, poverty, inequality.

- It links political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

### HC61 – Indian Economy II

- This course examines sector-specific polices and their impact in shaping trends in key economic indicators in India.
- It highlights major policy debates and evaluates the Indian empirical evidence.
- It emphasises on the issues and challenges faced by primary, secondary and tertiary sectors in India.
- At the end of the course, a student should be able to understand the role of economic policies in shaping and improving economic performance in agriculture, manufacturing and services.

### HC62 – Development Economics II

- This course teaches the student various aspects of the Indian economy, as well as important themes relating to the environment and sustainable development.
- It begins with basic demographic concepts and their evolution during the process of development.
- The governance of communities and organizations is studied and this is then linked to questions of sustainable growth.
- It also introduces them to some issues of globalisation.

## 1.2 Discipline Specific Elective Courses

### HE51 – Game Theory

- The students will learn how to model multi-person decision making in an interactive setting.
- They will understand how to formulate different real-life situations as games and learn to predict the optimal strategies of players.
- It will teach them how the players can exploit strategic situations for their own benefit.
- The course ends with the application of game theory to analyse moral hazard, adverse selection and signalling problems.

### HE52 – International Trade

- The module aims to introduce students to the main theoretical and empirical concepts in international trade, equip students with a thorough analytical grasp of trade theory, ranging from Ricardian comparative advantage to modern theories of intra-industry trade, and familiarise students with the main issues in trade policy and with the basic features of the international trading regime.
- At the end of the course, the students should be able to demonstrate their understanding of the economic concepts of trade theory.
- In some models, the student will be required to deal with simple algebraic

problems that will help them to better understand these concepts using a diagrammatic analysis.
- They will compare the economic welfare effects of free trade and protection and demonstrate their understanding of the usefulness and problems related to topics in international trade, and demonstrate their critical understanding of trade policies.

### HE53 – Public Economics

- The module aims to introduce students to the main theoretical and empirical concepts in public economics, equip students with a thorough analytical grasp of implications of government intervention for allocation, distribution and stabilization, and familiarise students with the main issues in government revenues and expenditure.
- At the end of the module the students should be able to demonstrate their understanding of the public economics.
- In some models, the student will be required to deal with simple algebra problems that will help them to better understand these concepts using a diagrammatic analysis.
- They will compare the economic welfare effects of various environmental policy options, demonstrate their understanding of the usefulness and problems related to taxation and government expenditure, and demonstrate their critical understanding of public policies.

### HE54 – Financial Economics

- Students acquire extensive theoretical knowledge in portfolio risk management, capital asset pricing, and the operation of financial derivatives.
- The course familiarises students with the terms and concepts related to financial markets and helps them comprehend business news/articles better.
- The course also helps to enhance a student's understanding of real-life investment decisions.
- The course has a strong employability quotient given the relatively high demand for skilled experts in the financial sector.

### HE55 – Applied Econometrics

- It builds on the compulsory Introductory Econometrics course and teaches students a broad set of commonly used econometric methods.
- These include estimating models with limited dependent variables and the use of instrumental variables to estimate models with endogenous regressors.
- Students will learn the theoretical basis for techniques widely used in empirical research.
- They will also be exposed to the application of these techniques in a wide range of problems.

## HE56 – Economic History of India 1857-1947

- The course develops critical analytical skills and exposes students to understanding the intricacies of India's economic, political and social developments both in the past and present times.
- It investigates the mechanisms that linked economic development in India to the compulsions of colonial rule.
- It increases their employability by enhancing their ability to deal with a variety of textual and statistical sources, and to draw upon them to construct a coherent argument.
- These skills would be useful in a variety of careers in academics, research, journalism and the government.

## HE57 – Political Economy I

- This course prepares the students to develop critical thinking by exposing them to elements of economic thought, juxtaposing ideas and theoretical structures based largely on original texts and journal articles.
- Students learn to assimilate from a diverse range of opinions and crystallize their own thought processes and standpoints.
- This also helps them to develop advanced writing, presentation and research skills. It further enables them to comprehend a larger view of the world around us by analysing the existing social and political structures and their links with the economic processes.
- It is thus a crucial course, which exposes the social science
- dimension of economics to the students and also provides them skills to think and analyse in an interdisciplinary manner. The exposure to interdisciplinary thinking further enables the students for pursuing studies in diverse related areas such as development studies, economic sociology, critical geography, gender studies and social work as also for taking up employment in organisations ranging from international development agencies to development NGOs and corporate CSR.
- It also prepares the students to face the practical world of work, where economics, business, civil society organisations, social institutions and politics often cohabit in a complex interlinked structure.

## HE62 – Economics of Health and Education

- The students will learn the role of health and education in human development.
- They will be able to apply economic theory to understand the demand for health care, market failure in health insurance, economic evaluation of health care programmes and the role of public policy in the healthcare industry.
- They will also learn to analyse the returns to education, its role in labour market signalling, and the progress of schooling in India.
- They will also be exposed to the theories of discrimination.

## HE63 – Environmental Economics

- The module aims to introduce students to the main theoretical and empirical concept in environmental economics, equip students with a thorough analytical grasp of environmental policy theory, ranging from externalities to international

environmental agreements, and familiarise students with the main issues in environmental valuation and with the basic features of the environmental policy tools.

- At the end of the module the students should be able to demonstrate their understanding of the economic concepts of environmental policy.
- In some models, the student will be required to deal with simple algebra problems that will help them to better understand these concepts using a diagrammatic analysis.
- They will also compare the economic welfare effects of various environmental policy options, demonstrate their understanding of the usefulness and problems related to environmental valuation, and demonstrate their critical understanding of environmental policies.

### HE64 – Open Economy Macroeconomics

- The student will know how exchange rates, interest rates and capital movements between currencies are determined within different institutional settings for monetary policy (e.g. inflation targeting versus money supply targeting or exchange rate targeting), how a country's current account balance is determined, or, which amounts to the same, how capital movement between countries are determined, how shocks emanating abroad or in the foreign exchange market affect output, employment, inflation and interest rates.
- They will also understand how the effects of changes in fiscal and monetary policy and shifts in private sector behaviour are modified through the foreign exchange markets and foreign trade, the role of cost competitiveness in the determination of economic activity, the different responses to economic shocks in the traded-goods and non-traded goods sectors of the economy, how the effects of policy actions and economic shocks are transmitted from country to country in the world economy, and the merits of different exchange rate systems (fixed versus flexible, monetary unions).
- In particular, you will learn more about the effects over time as flows accumulate to stocks and as the economy moves towards long-run equilibrium.
- At the end of course they will acquire to analyse the effects of macroeconomic events on the future time path of the economy, analyse how forces inherent in the initial state of the economy will tend to change the economy over time, discuss how current and future events may influence the exchange rate through expectations, and come up with policy suggestions and consider their effects over time.

### HE65 – Money and Financial Markets

- This course exposes students to the theory and functioning of the monetary and financial sectors of the economy.
- It highlights the organisation, structure, and role of financial markets and institutions. It also discusses interest rates, monetary management, and instruments of monetary control.
- Financial and banking sector reforms and monetary policy with special reference to India are also covered.
- This allows students to understand current monetary policies and financial market outcomes. It also enables them to critically evaluate policies.

### HE66 – Comparative Economic Development 1850-1950

- This course analyses key aspects of Indian economic development during the second half of British colonial rule.
- In doing so, it investigates the mechanisms that linked economic development in India to the compulsions of colonial rule.
- By analysing the history of industrialisation and economic transition, students will be able to visualise economic development in a historical perspective and assimilate material from a diverse range of opinions.
- It will help them to think in an interdisciplinary manner and therefore aid them in jobs where developing and presenting comparative perspectives are key tasks.

### HE67 – Law and Economics

- This course will familiarise students with the economic approach towards thinking about the law and public policy.
- Students will come to recognise the law as an important organising force that influences the actions of private citizens as well as government agencies.
- Students will also learn how the law can support and, at times conflict with, the functioning of the market and the government, the other two important organising forces of an economy.
- The course will enhance critical thinking and an inter-disciplinary approach towards the law, economics, and policymaking.
- Thereby, the course will help to develop an inter-disciplinary approach and enhance the employability of students.

### HE68 – Political Economy II

- This course exposes the students to the realities of the contemporary world economy and teaches them to develop critical analysis in an integrated and broader political economy framework.
- It thus enables them to form a more informed view of the world we inhabit by analysing some of the most contemporary trends and developments from different perspectives. It also exposes the students to interdisciplinary skills and written argumentation, and prepares them for a more holistic research framework.
- The exposure to interdisciplinary thinking further enables the students for pursuing studies in diverse related areas such as development studies, economic sociology, critical geography, gender studies and social work as also for taking up employment in organisations ranging from international development agencies to development NGOs and corporate CSR.
- It also prepares the students to face the practical world of work, where economics, business, civil society organisations, social institutions and politics often cohabit in a complex interlinked structure, and employees are expected to comprehend and synthesize materials from diverse sources and perspectives.

## 1.3 Generic Elective Courses

## GE11 – Introductory Microeconomics

- This course is designed to expose the students to the basic principles of microeconomic theory.
- The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyse real-life situations.
- The course introduces the students to the first course in Economics from the perspective of individual decision making as consumers and producers.
- The students learn some basic principles of microeconomics, interactions of supply and demand and characteristics of perfect and imperfect markets.

## GE21 – Introductory Macroeconomics

- This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy.
- This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like GDP, savings, investment, money, inflation, and the balance of payments.
- It also introduces students to simple analytical frameworks (e.g., the IS-LM model) for determination of equilibrium output.
- This course will allow students to understand the basic functioning of the macroeconomy.

## GE31 – Data Analysis

- This is a skill enhancement course for data analysis.
- The students will be given hands on training on using statistical and computing software to better visualize and understand data concepts.
- The course will use data simulations and publicly available data sources to help students learn about data types, their organization and visual representation.
- They will learn how to compute summary statistics and do some basic statistical inference.

## GE32 – Money and Banking

- This course highlights the organization, structure and role of financial markets and institutions.
- It also discusses interest rates, monetary management and instruments of monetary control.
- Financial and banking sector reforms and monetary policy with special reference to India are also covered.
- This course exposes students to the theory and functioning of the monetary and financial sectors of the economy.

## GE33 – Indian Economy I

- This course reviews major trends in aggregate economic indicators in India and places these against the backdrop of major policy debates in India in the post-independence period.
- This course will help students understand the key issues related to the Indian economy.
- It will broaden their horizons and enable them to analyse current economic policy.
- It will improve their chances of getting employed, and will be more effective, in positions of responsibility and decision making.

## GE34 – Economic History of India

- This course analyses key aspects of Indian economic development during the second half of British colonial rule.
- In doing so, it investigates the mechanisms that linked economic development in India to the compulsions of colonial rule.
- The course exposes the students to understanding the intricacies of India's economic, political and social developments both in the past and present times.
- It develops analytical skills, and will be useful in a variety of careers in academics, research, journalism, private sector and government.

## GE41 – Public Finance

- The module aims to introduce students to the main concepts in public finance, equip students with a thorough analytical grasp of government taxes: direct and indirect taxes, and familiarise students with the main issues in government expenditure.
- At the end of the module the students should be able to demonstrate their understanding of the economic concepts of public finances using diagrammatic analysis.
- They will also learn to compare the economic welfare effects of various government policy options, and demonstrate their understanding of the usefulness and problems related to government revenues and expenditures.
- The course will be useful for students aiming towards careers in the government sector, policy analysis, business and journalism.

## GE42 – Indian Economy II

- The course seeks to equip students with sector-specific knowledge and skills to analyse key economic issues and policy documents.
- It will also enable them to relate theoretical frameworks of macroeconomics and microeconomics to the Indian context.
- Students will have capability to understand government policies.
- It will enable informed participation in economic decision making, thus improve their employment prospects and career advancement.

## GE43 – Global Political Economy

- This course enables students who have not studied economics at the undergraduate level to develop a critical understanding of the contemporary global economy.

- It enables them to form a more informed view of the world we inhabit by analysing some of the economic trends and developments over the last five or six decades.
- As the economy is a crucial sphere both of social life in general and the world of work in particular, an analytical exposure to the structures, institutions and processes of the global economy will thus enrich their comprehension of the contemporary world.
- With such a comprehension, students from all backgrounds will thus be better prepared to face the professional world and can use the knowledge base of this course for facing the challenges of group discussions and general interviews for corporate or civil service jobs.
- Students of other social sciences and humanities, who intend to pursue higher studies and research, will also immensely benefit from this course by being able to develop an interdisciplinary understanding of basic economic structures and processes, which are often crucial to the understanding of their core subjects.

### GE44 – Game Theory

- This course introduces the basic concepts of game theory in a way that allows students to use them in solving simple problems in various disciplines.
- The course will deal with the solution concepts for normal form and extensive form games along with a variety of applications. Ideas related to asymmetric information among the interacting agents would also be analysed in this course.
- The students will learn how to model multi-person decision-making in an interactive setting.
- They will understand how to formulate different real-life situations as games and learn to predict the optimal strategies of players and how the players can exploit strategic situations for the benefit of their own.
- The course ends with the application of game theory to analyse moral hazard, adverse selection and signalling problems.

## 1.4 Skill Enhancement Courses

### HS31 – Data Analysis

- This is a skill enhancement course for data analysis.
- The students will be given hands on training on using statistical and computing software to better visualize and understand data concepts.
- The course will use data simulations and publicly available data sources to help students learn about data types, their organization and visual representation.
- They will learn how to compute summary statistics and do some basic statistical inference.

### HS41 – Research Methodology

- The course begins with the formulation of a research problem and covers the issues concerning the generation of primary sample data.
- In this regard the designing of a questionnaire, the methods of design of a sample and its size, the modes of data collection from direct interview to online surveys, the

appreciation of possible sources of errors, and the cleaning of data forms the bulk of the classroom instruction.
- The course imparts skills to undertake data-based research.
- The student enrolling in this course would develop competency in executing sample surveys and would have reasonable exposure to a variety of secondary data sources.

### HS42 – Contemporary Economic Issues

- The course seeks to familiarize students with basic concepts related to the Economic Survey and Union Budget.
- It aims to equip students with sufficient knowledge and skills to analyse these documents.
- Students will have the capability to understand government policies.
- They will in general be informed participants in economic decision making.

## 2. B. COM (H)

### 2.1 Core Courses

### BCH 1.2 – Financial Accounting

After completing the course, the student shall be able to:

- understand the theoretical framework of accounting and to prepare financial statements.
- explain and determine depreciation and value of inventory.
- learn accounting for hire purchase transactions, leases, branches and departments.
- understand the concepts of partnership firm and prepare accounts for dissolution of a partnership firm.
- develop the skill of preparation of trading and profit and loss account and balance sheet using computerized accounting.

### BCH 1.3 – Business Laws

After completing the course, the student shall be able to:

- understand basic aspects of contracts for making the agreements, contracts and subsequently enter valid business propositions.
- be able to recognize and differentiate the special contracts and identify their appropriate usage at varied business scenarios.
- equip the students about the legitimate rights and obligations under The Sale of Goods Act.
- enable with skills to initiate entrepreneurial ventures as LLP.
- understand the fundamentals of Internet based activities under The Information and Technology Act.

## BCH 2.2 – Corporate Accounting

After completing the course, the student shall be able to:

- develop an understanding of accounting for share capital and debentures.
- prepare financial statements of a company.
- develop an understanding of cash flow statements.
- understand the accounting for amalgamation and liquidation of companies.
- prepare consolidated balance sheet for Holding company.

## BCH 2.3 – Corporate Laws

After completing the course, the student shall be able to:

- understand the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act 2013 and Rules there under.
- follow the basic legal documents and their usage essential for operations and management of company.
- enable the students to synthesis company processes, meetings and decisions.
- equip the students with framework of dividend distribution and role of auditors in a company.
- comprehend and evaluate working of depositories and their functions in stock markets.

## BCH 3.1 – Human Resource Management

After completing the course, the student shall be able to:

- understand basic nature and importance of human resource management.
- analyse the current theory and practice of recruitment and selection.
- realize the importance of performance management system in enhancing employee performance.
- recommend actions based on results of the compensation analysis and design compensation schemes that are cost effective, that increase productivity of the workforce, and comply with the legal framework.
- understand role of modern HRM in meeting challenges of changing business environment.

## BCH 3.2 – Income Tax Law and Practice

After completing the course, the student shall be able to:

- understand the basic concepts in the law of income tax and determine the residential status of different persons.
- identify the five heads in which income is categorised and compute income under the heads ‘Salaries’ and ‘Income from House Property’.
- compute income under the head ‘Profits and gains of business or profession’, ‘Capital gains’ and ‘Income from other sources’.
- understand clubbing provisions, aggregate income after set-off and carry forward of losses, and deductions allowed under the Income Tax Act; and further to compute taxable income and tax liability of individuals and firms.

- develop the ability to file online returns of income.

### BCH 3.3 – Management Principles and Applications

After completing the course, the student shall be able to:

- understand the evolution of management and apprehend its effect on future managers.
- analyse how organisations adapt to an uncertain environment and decipher decision making techniques managers use to influence and control the internal environment.
- comprehend the changes happening in organisation structure over time.
- analyse the relationship amongst functions of management i.e. planning, organizing, directing and controlling.
- appreciate the changing dynamics of management practice.

### BCH 4.1 – Cost Accounting

After completing the course, the student shall be able to:

- understand thoroughly the conceptual framework of Cost Accounting; identification of differences between different financial and cost accounting; cost concepts and elements of cost; preparation of cost sheet.
- understand the accounting and control of material and labour cost.
- develop ability to understand classification, allocation, apportionment and absorption of overheads in cost determination; under and over absorption of overheads; treatment of various item of overheads.
- develop ability to calculate the cost of products, jobs, contracts, processes and services after understanding the basic concepts and processes involved in them.
- understand cost accounting book keeping systems and reconciliation of cost and financial account profits.

### BCH 4.2 – Business Mathematics

After completing the course, the student shall be able to:

- comprehend the concept of systematic processing and interpreting the information in quantitative terms to arrive at an optimum solution to business problems.
- develop proficiency in using different mathematical tools (matrices, calculus, linear programming, and mathematics of finance) in solving daily life problems.
- acquire competence to use computer for mathematical computations, especially with Big data.
- obtain critical thinking and problem-solving aptitude.
- evaluate the role played by mathematics in the world of business and economy.

### BCH 4.3 – Computer Applications in Business

After completing the course, the student shall be able to:

- understand the various concepts and terminologies used in computer networks and internet and be aware of the recent developments in the fast changing digital business world.
- handle document creation for communication.

- acquire skills to create and make good presentations.
- make various computations in the area of accounting and finance and represent the business data using suitable charts. S/He should be able to manipulate and analyse the business data for better understanding of the business environment and decision making.
- understand and apply the various database concepts and tools in the related business areas with the help of suggested popular software.

### BCH 5.1 – Principles of Marketing

After completing the course, the student shall be able to:

- develop understanding of basic concepts of marketing, marketing philosophies and environmental conditions effecting marketing decisions of a firm.
- understand the dynamics of consumer behaviour and process of market selection through STP stages.
- understand and analyse the process of value creation through marketing decisions involving product development.
- understand and analyse the process of value creation through marketing decisions involving product pricing and its distribution.
- understand and analyse the process of value creation through marketing decisions involving product promotion and also to equip them with the knowledge of various developments in marketing area that may govern marketing decisions of a firm.

### BCH 5.2 – Financial Management

After completing the course, the student shall be able to:

- explain the nature and scope of financial management as well as time value of money and risk return trade off.
- analyse capital budgeting process and capital budgeting techniques.
- estimate various capital structure theories and factors affecting capital structure decisions in a firm.
- critically examine various theories of dividend and factors affecting dividend policy.
- evaluate working capital requirement.

### BCH 6.1 – Auditing and Corporate Governance

After completing the course, the student shall be able to:

- differentiate between different aspects of auditing especially for internal check, internal control and for overall corporate governance.
- understand the concept of corporate governance in organisations and its essence for management.
- provide and assimilate information leading to failure of organisation and corporate scams.
- comprehend the governance framework for an organisation provided by different regulatory bodies in India and Abroad.
- recognise the essence of ethics in business.

### BCH 6.2 – Goods and Service Tax and Customs Law

After completing the course, the student shall be able to:

- connect with the genesis of goods and services tax (GST), decipher the constitutional amendment carried out to install GST in India and comprehend the composition and working of GST council.
- understand the meaning of supply under GST law, differentiate between intra-state and inter-state supply, comprehend rules related to the place of supply and compute the value of supply.
- comprehend the utilization of input tax credit, and the reverse charge mechanism of paying GST and to know the procedure for claiming refund under GST law.
- understand the provisions for registration under GST along with special provisions such as those related to anti-profiteering; avoidance of dual control; e-way bills and penalties.
- know the basic concepts of Customs Act and to compute the assessable value for charging customs duty.

## 2.2 Discipline Specific Elective Courses

### BCH 5.3 (a) – Management Accounting

After completing the course, the student shall be able to:

- understand thoroughly the conceptual framework of Management Accounting; identification of differences between different forms of accounting—Financial, Cost and Managerial; distinction between cost control and cost reduction.
- understand the concept of marginal cost and marginal costing; preparation of income statements using absorption and variable costing; learning of cost-volume-profit analysis and break-even analysis using mathematical and graphical approaches; and the application in businesses.
- understand the concept of relevant and irrelevant costs and make decisions related to different business situations using marginal costing and differential costing techniques.
- understand budgetary control system as a tool of managerial planning and control; ability to prepare various types of budgets. Ability to understand standard costing system as a tool of managerial control; calculation of variances in respect of each element of cost and sales; control ratios.
- understand management accounting issues of Responsibility accounting, Divisional performance measurement and Transfer pricing.

### BCH 5.3(b) – Organisational Behaviour

After completing the course, the student shall be able to:

- understand the development of organisational behaviour and its importance in managing people at the workplace.
- understand how individuals behave under different conditions and why individuals behave as they do.
- appreciate different theories of motivation.
- critically evaluate leadership styles and strategies.

- critically evaluate the potential effects of organisation culture and stress on behaviour in organisation so as to direct the same towards predetermined goals.

### BCH 5.3(c) – Macro Economics

After completing the course, the student shall be able to:

- describe the nature and scope of Macro Economics, Income, Expenditure and their components and determinants.
- expose fiscal and monetary policy implications through IS-LM framework in short run and long run.
- comprehend the different theories of demand for money, supply of money approach and working of money multiplier.
- elucidate causes and effects of different types of inflation and trade-off between inflation and unemployment.
- describe the role of saving and investment in different size of economies on trade and exchange rate and rate of interest.

### BCH 5.3 (d) – Entrepreneurship Development

After completing the course, the student shall be able to:

- understand the concept of entrepreneurship in the context of Indian economic scenario.
- link the individual's capability and strength as a guiding factor towards entrepreneurial orientation.
- understand social support system for gaining strength towards entrepreneurial preferences.
- understand entrepreneurial process for initiating new venture creation.
- understand various dimensions of managing a business enterprise once it is formed.

### BCH 5.4 (a) – Corporate Tax Planning

After completing the course, the student shall be able to:

- differentiate between various tax planning concepts and understand the procedure of assessment of corporate assesses.
- devise strategies for tax planning in respect of a new business, understand the specific tax issues for start-ups, and comprehend the Income Tax provisions relevant for financial management decisions.
- decipher the tax factors relevant for managerial decisions and to understand how to develop pay packages for employees.
- recognize the relevant Tax provisions for Non-resident Indians and to understand how to claim relief in case of double taxation of income.
- understand tax planning with reference to business restructuring.

### BCH 5.4 (b) – Financial Markets, Institutions and Services

After completing the course, the student shall be able to:

- understand the meaning and scope of financial markets as well as institutions in India.
- understand the concepts of Money Market and Capital Market.

- explain Commercial Banking and its Current developments.
- explain concept of Non-Banking Financial Companies (NBFC's).
- examine the Financial Services Industry.

### BCH 5.4 (c) – Advertising and Personal Selling

After completing the course, the student shall be able to:

- understand the communication objectives behind advertising and promotions.
- understand the various advertising and media elements in the advertising decisions.
- identify the ethical and legal issues of advertising.
- comprehend the importance and role of personal selling.
- understand the process of personal selling.

### BCH 5.4 (d) – Business Statistics

After completing the course, the student shall be able to:

- acquire a fair degree of proficiency in comprehending statistical data, processing and analysing it using descriptive statistical tools.
- gather knowledge about various probability concepts and distributions and their business applications.
- understand the relationship between two variables using concepts of correlation and regression and its use in identifying and predicting the variables.
- develop an understanding of the index numbers and their utility in daily life and stock market.
- become aware of the patterns revealed by the time series data and to use it to make predictions for the future.

### BCH 6.3 (a) – Fundamentals of Investment

After completing the course, the student shall be able to:

- explain investment environment and concept of return & risk.
- understand bond valuation & role of credit rating agencies.
- examine equity approaches.
- analyse two securities portfolio using Harry Markowitz model, Calculating portfolio risk and return, explaining CAPM and evaluating Mutual Funds and Financial derivatives.
- evaluate investors protection framework.

### BCH 6.3 (b) – Compensation Management

After completing the course, the student shall be able to:

- acquaint with basic legal framework envisaged under the statutes for compensation and welfare of employees in different modes.
- identify the internal and external environmental factors that have an impact on pay structure of an organisation.

- understand the various principles involved and premise of the grant of bonus, wages, and minimum wages to workers.
- understand international compensation rules to meet requirement of overseas workforce.
- know various compensation laws to meet employee satisfaction.

### BCH 6.3 (c) – Business Tax Procedure and Management

After completing the course, the student shall be able to:

- know the schedule for the payment of tax in advance, understand the provisions for deduction of tax at source and compute the tax interest and fee payable to / by government.
- understand the procedure of assessment and filing of appeals.
- know penalties for offences related to income tax, provisions relating to undisclosed income, and provisions of search and seizure.
- understand the concept of GAAR and conditions for levy of Securities Transaction Tax.
- know Information Technology network of Income Tax Department and learn about various Income Tax authorities and their powers.

### BCH 6.3 (d) – Consumer Affairs and Customer Care

After completing the course, the student shall be able to:

- understand the importance of consumer buying process and to identify the ethical and legal issues in advertisements and in packaging.
- learn how to pursue the consumer rights under consumer protection act 1986.
- understand the procedure of filing a complaint.
- analyse the role of industry regulators in consumer protection.
- comprehend the hearings, enquiry and appeal provisions.

### BCH 6.4 (a) – Financial Reporting and Analysis

After completing the course, the student shall be able to:

- describe the conceptual framework of financial reporting have an understanding the components of financial statements.
- identify major disclosures to be made in the annual report by the listed companies.
- explain techniques of analysis of financial statements.
- analyse and interpret financial statements of companies using the case study method.
- gain understanding of emerging areas in financial reporting - Accounting for E-commerce business, value added statements and Integrated Reporting.

### BCH 6.4 (b) – Banking and Insurance

After completing the course, the student shall be able to:

- understand the meaning and scope of Banking with functions of Banks and their role into banking.
- familiarize with regard to operations of Banking and various services and benefits.

- develop insights on lending operations of banking and causes of NPA into banking sector.
- acquaint with the concept of Insurance through functions and fundamental principles of Insurance.
- understand the types of Insurance and Regulatory framework of Insurance.

### BCH 6.4 (c) – Project Management and Techniques

After completing the course, the student shall be able to:

- explain the concept and attributes of projects, project management system, process and its principles.
- perform technical feasibility, marketing feasibility and commercial viability using NPV, and further to understand tax and legal aspects of a project.
- analyse project appraisal in public & private sector and estimate shadow prices and social discount rate.
- examine project risk and performance assessment.
- evaluate project management techniques using case studies.

### BCH 6.4 (d) – International Business

After completing the course, the student shall be able to:

- understand the process of globalization, its impact on the evolution and growth of international business and to appreciate the changing dynamics of the diverse international business environment.
- analyse the theoretical dimensions of international trade and intervention measures adopted; to appreciate the significance of different forms of regional economic integration and to understand the concept of Balance of payment account and its components.
- understand the significance of different forms of regional economic integration and to appreciate the role played by various international economic organisations such as the WTO, UNCTAD, IMF and World Bank.
- familiarize students with the international financial environment, and get them acquainted with the basic features of the foreign exchange market – its features and determinants.
- critically examine the concept and form of foreign direct investment, and to create awareness about emerging issues in international business such as outsourcing and ecological issues.

### BCH 6.4 (e) – Industrial Relations and Labour Laws

After completing the course, the student shall be able to:

- understand evolution of industrial relations and its significance in managerial world.
- imbibe how to interact, negotiate and transact with trade unions.
- acquaint with the basic framework of collective bargaining and workers' participation.
- design and understand the discipline measures and address grievance mechanisms.

- understand the legal structure provided for grievance handling under the Industrial Disputes Act 1947.

## 2.3 Generic Elective Courses

### BCH 1.4 (a) – Basics of Accounting

After completing the course, the student shall be able to:

- gain an understanding of theoretical framework of accounting.
- explain the concept of accounting equation and accounting process.
- develop understanding of depreciation and inventory.
- understand financial statements of a company.
- state the meaning, objectives and significance of different types of ratios.

### BCH 1.4 (b) – Business Organisation and Management

After completing the course, the student shall be able to:

- learn business activities to compete in competitive world.
- understand entrepreneurship from local to international perspective.
- evaluate the application of functional areas of business activity.
- analyse decision making and communication.
- evaluate the impact of legal, social, and economic environment on business.

### BCH 2.4 (a) – Entrepreneurship

After completing the course, the student shall be able to:

- understand entrepreneurship as volition in context of India.
- gather knowledge and ideas on the existing support system for entrepreneurial orientation.
- understand enterprise formation process for gaining ideas as to creation of an enterprise for pursuing a career.
- understand requirements of post-enterprise creation for effective operation of the business.
- gain knowledge on available growth strategies for implementing effective suitable strategy for expansion and growth.

### BCH 2.4 (b) – Finance for Non-Finance Executives

After completing the course, the student shall be able to:

- understand the overview of finance, concept of time value of money as well as concept of risk & return.
- learn financial analysis with the aid of various financial statements & analyse capital budgeting process and techniques.
- analyse cost of capital, capital structure and leverage.
- examine dividend & working capital dividend decisions.
- perform valuation of securities.

### BCH 3.4 (a) – Investing in Stock Markets

After completing the course, the student shall be able to:

- learn the basics of investing in stock market, the investment environment as well as risk & return.
- analyse Indian securities market including the derivatives market.
- examine EIC framework and conduct fundamental analysis.
- perform technical analysis.
- invest in mutual funds market.

### BCH 3.4 (b) – Human Resource Management

After completing the course, the student shall be able to:

- understand different tools used in forecasting and planning human resource needs.
- demonstrate the ability to prepare a selection strategy for a specific job.
- understand the significance of different methods of performance appraisal.
- recommend actions based on results of the compensation analysis and design
- compensation schemes that are cost effective, that increase productivity of the work force, and comply with the legal framework.
- understand modern HRM to meet the challenges of changing business environment.

### BCH 3.4 (c) – Fundamentals of Marketing

After completing the course, the student shall be able to:

- learn the basic concepts and principles of marketing and to develop their conceptual skill to be able to manage marketing operations of a business firm.
- understand the complexities involved in various targeting and positioning decisions.
- take effective decisions for launching new products and to understand the implications of different pricing strategies.
- develop the skills to design the promotion-mix strategies.
- familiarize about the current trends in marketing to take proactive measures while taking marketing decisions.

### BCH 4.4 (a) – Insurance and Risk Management

After completing the course, the student shall be able to:

- understand the Concept of Risk, it’s types, sources and measurements.
- learn the Concepts and Principles of Insurance and its operations.
- develop insights into various types of Insurance.
- examine the Legal aspects of Insurance contract and Actuaries.
- familiarize with the Regulatory Framework of Insurance.

### BCH 4.4 (b) – Project Management and Techniques

After completing the course, the student shall be able to:

- familiarize with the concept of project management and its attributes.
- understand project planning and project analysis.
- perform project appraisal.
- examine project risk and conduct performance assessment and quality management of the project.
- learn cases in project management.

## 2.4 Skill Enhancement Courses

### BCH 3.5 (a) – E-Commerce

After completing the course, the student shall be able to:

- understand the basics of E-commerce, current and emerging business models.
- familiarise with basic business operations such as sales, marketing, HR etc. on the web.
- enhance the students' skills for designing and developing website.
- identify the emerging modes of e-payment.
- understand the importance of security, privacy, ethical and legal issues of e-commerce.

### BCH 3.5 (b) – Training and Development

After completing the course, the student shall be able to:

- learn the practical applications of training and development theories in recent times.
- learn to design training programmes for diverse workforce.
- understand the role of development officers.
- evaluate training and development programmes.
- recognize the mechanism of career development programmes.

### BCH 3.5 (c) – Digital Marketing

After completing the course, the student shall be able to:

- identify and assess the impact of digital technology in transforming the business environment and also the customer journey.
- understand how marketers think, conceptualize, test continuously to optimise their product search on digital platforms.
- illustrate how the effectiveness of a digital marketing campaign can be measured.
- demonstrate their skills in digital marketing tools such as SEO, social media, and Blogging for engaging the digital generation.
- appreciate the need for regulatory framework for digital marketing in India.

### BCH 3.5 (d) – Personal Tax Planning

After completing the course, the student shall be able to:

- understand the concept of tax planning, use the residential status to plan the scope of income and devise tax planning strategy in relation to agricultural income.

- apply critical thinking and problem-solving skills related to minimization of tax liability of individuals with respect to salary income and understand how to develop efficient pay packages.
- devise tax planning strategies in relation to house property and understand the presumptive scheme of taxation of computing business income.
- use Indexation technique to reduce capital gains tax and learn about specific exemptions available from capital gains.
- use deductions to reduce taxable income and use rebates to reduce tax liability.

### BCH 3.5 (e) – Communication and Documentation in Business

After completing the course, the student shall be able to:

- realize the significance of effective communication in business.
- learn business vocabulary and understand varied ways/methods to present business plans.
- gain knowledge on drafting of official letters and documents.
- develop appropriate skills for report writing and different ways of documentation.
- understand the role of information technology for enabling business communication and documentation.

### BCH 3.5 (f) – Personal Finance and Planning

After completing the course, the student shall be able to:

- understand the meaning and relevance of Financial Planning.
- familiarize with regard to the concept of Investment Planning and its methods.
- examine concept of Personal Tax Planning.
- analyse Insurance Planning and its relevance.
- develop insights in to Retirement planning and its relevance.

### BCH 4.5 (a) – Computerised Accounting System

After completing the course, the student shall be able to:

- understand Computerized Accounting System environment.
- create structure of Computerized Accounting System for a business firm.
- record day to day business transactions in Computerized Accounting System.
- make necessary tax adjustments while recording business transactions and to generate various Accounting Reports for analysis and decision making.
- perform verification and audit activities for the voucher entries passed in computerized accounting environment.

### BCH 4.5 (b) – Business Research Methods and Analytics

After completing the course, the student shall be able to:

- understand meaning and scope of business research.
- familiarize with research terminologies and various types of research design.
- get an insight into various scaling techniques and sources of data collection.

- get acquainted with various techniques of data analysis and its implications.
- have basic learning of analytics in business.

### BCH 4.5 (c) – Leadership and Team Development

After completing the course, the student shall be able to:

- gain theoretical and practical knowledge to evaluate leadership skills, styles and strategies in contemporary world so as to become a successful leader and effective employee in organisation.
- understand the group dynamics and group decision making so as to develop acumen to utilize the leadership and team building concepts, tools and techniques to handle the complex organisational problems at different levels.
- recognize the dynamics of group decision making.
- understand the working of various teams in organisations.
- evaluate the role of women as leader and using various social media platforms as effective means of communication in contemporary world as a leader.

### BCH 4.5 (d) – Collective Bargaining and Negotiation Skills

After completing the course, the student shall be able to:

- identify issues in collective bargaining, its significance.
- understand the levels, coverage and agreements of collective bargaining.
- work on liaison in negotiations.
- differentiate between negotiations, collective bargaining and use of its approaches.
- administer the negotiation agreement and handle grievance management.

### BCH 4.5 (e) – E-Filing of Returns

After completing the course, the student shall be able to:

- know the difference between e-filing and regular filing of Income tax returns and understand the circumstances when e-filling is mandatory.
- understand the basic process of computing taxable income and tax liability, and know about various types of income tax return forms.
- understand the concept of advance payment of tax and tax deduction at source and develop the ability of e-filing of TDS returns.
- become aware of the basic framework and structure of GST, including the meaning of input tax credit and the process of its utilization.
- know about various types of GST returns and their filing.

### BCH 4.5 (f) – Cyber Crimes and Laws

After completing the course, the student shall be able to:

- identify cyber risk associated with online activities.
- prepare them for safe working in the vertical having varied access points, data sources, network and system related issues, especially in online transactions.
- generate and preserve electronic evidences for personal and professional use.

- work in virtual space safely and with business process or products confirming to the regulatory framework and not falling under the ambit of cyber-crimes.
- analyse the cases and find pertinent facts for resolutions.

## 3. B. Sc (H) MATHEMATICS

### 3.1 Core Courses

#### BMATH101 – Calculus

This course will enable the students to:

- Learn first and second derivative tests for relative extrema and apply the knowledge in problems in business, economics and life sciences.
- Sketch curves in a plane using its mathematical properties in the different coordinate systems of reference.
- Compute area of surfaces of revolution and the volume of solids by integrating over cross-sectional areas.
- Understand the calculus of vector functions and its use to develop the basic principles of planetary motion.

#### BMATH102 – Algebra

This course will enable the students to:

- Employ De Moivre's theorem in a number of applications to solve numerical problems.
- Learn about equivalent classes and cardinality of a set.
- Use modular arithmetic and basic properties of congruences.
- Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix.
- Find eigenvalues and corresponding eigenvectors for a square matrix.

#### BMATH203 – Real Analysis

This course will enable the students to:

- Understand many properties of the real line R, including completeness and Archimedean properties.
- Learn to define sequences in terms of functions from N to a subset of R.
- Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
- Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.

## BMATH204 – Differential Analysis

The course will enable the students to:

- Learn basics of differential equations and mathematical modelling.
- Formulate differential equations for various mathematical models.
- Solve first order non-linear differential equations and linear differential equations of higher order using various techniques.
- Apply these techniques to solve and analyze various mathematical models.

## BMATH305 – Theory of Real Functions

This course will enable the students to:

- Have a rigorous understanding of the concept of limit of a function.
- Learn about continuity and uniform continuity of functions defined on intervals.
- Understand geometrical properties of continuous functions on closed and bounded intervals.
- Learn extensively about the concept of differentiability using limits, leading to a better understanding for applications.
- Know about applications of mean value theorems and Taylor's theorem.

## BMATH306 – Group Theory I

The course will enable the students to:

- Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc.
- Link the fundamental concepts of groups and symmetrical figures.
- Analyse the subgroups of cyclic groups and classify subgroups of cyclic groups.
- Explain the significance of the notion of cosets, normal subgroups and factor groups.
- Learn about Lagrange's theorem and Fermat's Little theorem.
- Know about group homomorphisms and group isomorphisms.

## BMATH307 – Multivariate Calculus

This course will enable the students to:

- Learn the conceptual variations when advancing in calculus from one variable to multivariable discussion.
- Understand the maximization and minimization of multivariable functions subject to the given constraints on variables.
- Learn about inter-relationship amongst the line integral, double and triple integral formulations.
- Familiarize with Green's, Stokes' and Gauss divergence theorems.

## BMATH408 – Partial Differential Equations

The course will enable the students to:

- Formulate, classify and transform first order PDEs into canonical form.

- Learn about method of characteristics and separation of variables to solve first order PDE's.
- Classify and solve second order linear PDEs.
- Learn about Cauchy problem for second order PDE and homogeneous and non-homogeneous wave equations.
- Apply the method of separation of variables for solving many well-known second order PDEs.

### BMATH409 - Reimann Integration and Series of Functions

The course will enable the students to:

- Learn about some of the classes and properties of Riemann integrable functions, and the applications of the Fundamental theorems of integration.
- Know about improper integrals including, beta and gamma functions.
- Learn about Cauchy criterion for uniform convergence and Weierstrass M-test for uniform convergence.
- Know about the constraints for the inter-changeability of differentiability and integrability with infinite sum.
- Approximate transcendental functions in terms of power series as well as, differentiation and integration of power series.

### BMATH410 – Ring Theory and Linear Algebra I

The course will enable the students to:

- Learn about the fundamental concept of rings, integral domains and fields.
- Know about ring homomorphisms and isomorphisms theorems of rings.
- Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.
- Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation, and the change of coordinate matrix.

### BMATH511 – Metric Spaces

The course will enable the students to:

- Learn various natural and abstract formulations of distance on the sets of usual or unusual entities. Become aware one such formulations leading to metric spaces.
- Analyse how a theory advances from a particular frame to a general frame.
- Appreciate the mathematical understanding of various geometrical concepts, viz. balls or connected sets etc. in an abstract setting.
- Know about Banach fixed point theorem, whose far-reaching consequences have resulted into an independent branch of study in analysis, known as fixed point theory.
- Learn about the two important topological properties, namely connectedness and compactness of metric spaces.

### BMATH512 – Group Theory II

The course shall enable students to:

- Learn about automorphisms for constructing new groups from the given group.
- Learn about the fact that external direct product applies to data security and electric circuits.
- Understand fundamental theorem of finite abelian groups.
- Be familiar with group actions and conjugacy in $S_n$.
- Understand Sylow theorems and their applications in checking non-simplicity.

### BMATH613 – Complex Analysis

The completion of the course will enable the students to:

- Learn the significance of differentiability of complex functions leading to the understanding of Cauchy−Riemann equations.
- Learn some elementary functions and valuate the contour integrals.
- Understand the role of Cauchy−Goursat theorem and the Cauchy integral formula.
- Expand some simple functions as their Taylor and Laurent series, classify the nature of singularities, find residues and apply Cauchy Residue theorem to evaluate integrals.

### BMATH614 – Ring Theory and Linear Algebra II

On completion of this course, the student will be able to:

- Appreciate the significance of unique factorization in rings and integral domains.
- Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric and the algebraic multiplicities of an eigenvalue and apply the basic diagonalization result.
- Compute inner products and determine orthogonality on vector spaces, including Gram−Schmidt orthogonalization to obtain orthonormal basis.
- Find the adjoint, normal, unitary and orthogonal operators.

## 3.2 Discipline Specific Elective Courses

### DSE-1(i) - Numerical Analysis

The course will enable the students to:

- Learn some numerical methods to find the zeroes of nonlinear functions of a single variable and solution of a system of linear equations, up to a certain given level of precision.
- Know about methods to solve system of linear equations, such as Gauss−Jacobi, Gauss−Seidel and SOR methods.
- Interpolation techniques to compute the values for a tabulated function at points not in the table.
- Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions.

### DSE-1(ii) – Mathematical Modelling and Graph Theory

The course will enable the students to:

- Know about power series solution of a differential equation and learn about Legendre's and Bessel's equations.
- Use of Laplace transform and inverse transform for solving initial value problems.
- Learn about various models such as Monte Carlo simulation models, queuing models, and linear programming models.
- Understand the basics of graph theory and learn about social networks, Eulerian and Hamiltonian graphs, diagram tracing puzzles and knight's tour problem.

### DSE-1(iii) – C++ Programming for Mathematics

After completion of this paper, student will be able to:

- Understand and apply the programming concepts of C++ which is important to mathematical investigation and problem solving.
- Learn about structured data-types in C++ and learn about applications in factorization of an integer and understanding Cartesian geometry and Pythagorean triples.
- Use of containers and templates in various applications in algebra.
- Use mathematical libraries for computational objectives.
- Represent the outputs of programs visually in terms of well formatted text and plots.

### DSE-2(i) – Probability Theory and Statistics

This course will enable the students to:

- Learn about probability density and moment generating functions.
- Know about various univariate distributions such as Bernoulli, Binomial, Poisson, gamma and exponential distributions.
- Learn about distributions to study the joint behaviour of two random variables.
- Measure the scale of association between two variables, and to establish a formulation helping to predict one variable in terms of the other, i.e., correlation and linear regression.
- Understand central limit theorem, which helps to understand the remarkable fact that: the empirical frequencies of so many natural populations, exhibit a bell-shaped curve, i.e., a normal distribution.

### DSE-2(ii) – Discrete Mathematics

After the course, the student will be able to:

- Understand the notion of ordered sets and maps between ordered sets.
- Learn about lattices, modular and distributive lattices, sublattices and homomorphisms between lattices.
- Become familiar with Boolean algebra, Boolean homomorphism, Karnaugh diagrams, switching circuits and their applications.
- Learn about basics of graph theory, including Eulerian graphs, Hamiltonian graphs.
- Learn about the applications of graph theory in the study of shortest path algorithms.

### DSE-2(iii) – Cryptography and Network Security

After the course, the student will be able to:

- Understand the fundamentals of cryptography and computer security attacks.
- Learn about various ciphers and data encryption standard.
- Review basic concepts of number theory and finite fields.
- Learn about advanced encryption standard.
- Understand the fundamentals of RSA and elliptic curve cryptography.
- Encrypt and decrypt messages using block ciphers, sign and verify messages using well known signature generation and verification algorithms.

### DSE-3(i) – Mathematical Finance

On completion of this course, the student will be able to:

- Know the basics of financial markets and derivatives including options and futures.
- Learn about pricing and hedging of options, as well as interest rate swaps.
- Learn about no-arbitrage pricing concept and types of options.
- Learn stochastic analysis (Ito formula, Ito integration) and the Black−Scholes model.
- Understand the concepts of trading strategies and valuation of currency swaps.

### DSE-3(ii) – Introduction to Information Theory and Coding

This course will enable the students to:

- Learn about the basic concepts of information theory.
- Know about basic relationship among different entropies and interpretation of Shannon's fundamental inequalities.
- Learn about the detection and correction of errors while transmission.
- Representation of a linear code by matrices.
- Learn about encoding and decoding of linear codes.

### DSE-3(iii) – Biomathematics

Apropos conclusion of the course will empower the student to:

- Learn the development, analysis and interpretation of bio mathematical models such as population growth, cell division, and predator-prey models.
- Learn about the mathematics behind heartbeat model and nerve impulse transmission model.
- Appreciate the theory of bifurcation and chaos.
- Learn to apply the basic concepts of probability to molecular evolution and genetics.

### DSE-4(i) – Number Theory

This course will enable the students to:

- Learn about some fascinating discoveries related to the properties of prime numbers, and some of the open problems in number theory, viz., Goldbach conjecture etc.
- Know about number theoretic functions and modular arithmetic.
- Solve linear, quadratic and system of linear congruence equations.
- Learn about public key crypto systems, in particular, RSA.

### DSE-4(ii) – Linear Programming and Applications

This course will enable the students to:

- Learn about the graphical solution of linear programming problem with two variables.
- Learn about the relation between basic feasible solutions and extreme points.
- Understand the theory of the simplex method used to solve linear programming problems.
- Learn about two-phase and big-M methods to deal with problems involving artificial variables.
- Learn about the relationships between the primal and dual problems.
- Solve transportation and assignment problems.
- Apply linear programming method to solve two-person zero-sum game problems.

### DSE-4(iii) – Mechanics

The course will enable the students to:

- Know about the concepts in statics such as moments, couples, equilibrium in both two and three dimensions.
- Understand the theory behind friction and centre of gravity.
- Calculate moments of inertia of areas and rigid bodies.
- Know about conservation of mechanical energy and work-energy equations.
- Learn about translational and rotational motion of rigid bodies.

## Skill Enhancement Courses

### SEC-1 – LaTeX and HTML

After studying this course, the student will be able to:

- Create and typeset a LaTeX document.
- Typeset a mathematical document using LaTex.
- Learn about pictures and graphics in LaTex.
- Create beamer presentations.
- Create web page using HTML.

### SEC-2 – Computer Algebra Systems and Related Software

This course will enable the students to:

- Use of computer algebra systems (Mathematica/MATLAB/Maxima/Maple etc.) as a calculator, for plotting functions and animations
- Use of CAS for various applications of matrices such as solving system of equations and finding eigenvalues and eigenvectors.
- Understand the use of the statistical software R as calculator and learn to read and get data into R.
- Learn the use of R in summary calculation, pictorial representation of data and exploring relationship between data.
- Analyse, test, and interpret technical arguments on the basis of geometry.

## 4. B. Sc (H) STATISTICS

### 4.1 Core Courses

#### STAT-C-101 – Descriptive Statistics

After completing this course, the students should develop an understanding of:

- Concepts of statistical population and sample, variables and attributes.
- Tabular and graphical representation of data based on variables.
- 'Conditions for the consistency' and criteria for the independence of data based on attributes.
- Measures of central tendency, Dispersion, Skewness and Kurtosis.
- Moments and their use in studying various characteristics of data.
- Different approaches to the theory of probability.
- Important theorems on probability and their use in solving problems.
- Concept of random variables and its probability distributions.
- Concept of joint, marginal and conditional probability distribution for two dimensional random variables and their independence.
- Univariate transformation and expectation of random variables.

#### STAT-C-102 – Calculus

After completing this course, students should develop an understanding of:

- The fundamental concepts of Differential calculus.
- Solving complicated integrals.
- Finding complete Solution of differential equations.
- Searching solution of partial differential equation.

#### STAT-C-201 – Probability and Probability Distributions

After completing this course, there should be a clear understanding of:

- The fundamental concept of expectation for univariate and bivariate random variables with their distributions and properties.
- Moment generating function, cumulant generating function and characteristic function.
- Discrete probability distributions with their properties.
- Continuous probability distributions with their properties.

#### STAT-C-202 – Algebra

After completing this course, students should develop an understanding of:

- Theory of Equations
- The fundamental concepts of matrices and determinants

- Echelon form
- Linear equations
- Rank of a Matrix
- Characteristic roots and vectors
- Quadratic forms
- Partitioning of matrices
- Generalized inverse

### STAT-C-301 – Sampling Distributions

After completing this course, students should develop an understanding of:

- Laws of convergence, their inter relations and applications.
- Central Limit Theorem and its applications.
- Order statistics and distribution of sample median and range.
- Basic concepts of hypothesis testing, including framing of null and alternative hypothesis.
- Hypothesis testing based on a single sample and two samples using both classical and p-value approach.
- Chi square distribution.
- Analyse categorical data by using Chi square techniques.
- t and F distributions and their applications.

### STAT-C-302 – Survey Sampling and Indian Official Statistics

After completing this course, students should develop an understanding of:

- The fundamental concepts of population and sample. (or the basic concepts of survey)
- The principles of sample survey and the steps involved in selecting a sample.
- Simple Random Sampling.
- Stratified Sampling.
- Systematic Sampling.
- Ratio and Regression Methods of Estimation.
- Cluster Sampling (equal size clusters).
- Sub Sampling.
- Indian Official Statistics.

### STAT-C-303 – Mathematical Analysis

After completing this course, students should develop an understanding of:

- Fundamental properties of real number and real-valued functions.
- Analytical properties of sequences.
- Infinite series, their properties and different tests.
- Limits, continuity, differentiability and mean value theorems.
- Fundamentals of numerical analysis, interpolation, numerical integration and difference equation.

## STAT-C-401 – Statistical Inference

After completing this course, students should develop an understanding of:

- Different methods of finding point estimators for unknown population parameters, their advantages and disadvantages.
- Desirable properties of point estimators based on which estimators can be compared.
- Methods to develop/find best point estimators based on the desirable properties (Using Cramer- Rao inequality, Rao-Blackwell theorem, and Lehmann-Scheffe Theorem).
- General methods of constructing interval estimators (Confidence Intervals) for unknown population parameters.
- Basic principle of Bayesian estimation (Finding posterior distributions of unknown population parameters).
- Developing/ constructing best/most powerful statistical tests to test hypotheses regarding unknown population parameters (Using Neyman-Pearson Lemma and Likelihood Ratio tests).
- Practical applications of estimation theory and hypothesis testing pertaining to all discussed methods.

## STAT-C-402 – Linear Models

After completing this course, students should develop an understanding of:

- Theory and estimation of Linear Models.
- Gauss-Markov Theorem and its use.
- Distribution of quadratic forms.
- Simple and Multiple linear regression models and their applications.
- Fitting of these models to real or synthetic data, derivation of confidence and prediction intervals, and a sound scientific interpretation of the results.
- Techniques of Analysis of Variance and Covariance under fixed effects model.
- Assessment of the quality of the fit using classical diagnostics, awareness of potential problems (outliers, etc.) and application of remedies to deal with them.

## STAT-C-403 – Statistical Quality Control

After completing this course, students should develop an understanding of:

- Statistical process control tools- Control charts for variables, attributes.
- Statistical product control tools- Sampling inspection plans.
- Overview of Six sigma- Lean manufacturing, TQM.
- Overview of Six sigma training plans, VOC, CTQ.
- Weighted and Unweighted Index Numbers.
- Base shifting, splicing and deflating of Index Numbers.

## STAT-C-501 – Stochastic Processes and Queuing Theory

After completing this course, students should develop an understanding of:

- The fundamental concepts of stochastic processes.
- Tools needed to analyse stochastic processes.
- Markov processes and Markov chains.

- Stability of Markov chains.
- Poisson process and its variations.
- Queuing systems.
- Random walk and ruin theory.

### STAT-C-502 – Statistical Computing using C/C++ Programming

After completing this course, students should develop an understanding of:

- Various data types, operators, library functions, Input/Output operations.
- Decision making and branching and looping.
- Arrays, Character and strings. User defined functions, recursion functions.
- Storage class of Variables.
- Pointers.
- Pointers and arrays, arrays of pointers, pointers as function arguments, functions returning pointers.
- Structure, array of structures, structure pointers.
- Dynamic memory allocation functions.
- Pre-processors: Macro substitution, macro with argument.
- File inclusion in C/C++, I/O operations on files.

### STAT-C-601 – Design of Experiments

After completing this course, students should develop an understanding of:

- The fundamental concepts of design of experiments.
- Introduction to planning valid and economical experiments within given resources.
- Completely randomized design.
- Randomized block design.
- Latin square design.
- Balanced incomplete block design.
- Full and confounded factorial designs with two and three levels.
- Fractional factorial designs with two levels.

### STAT-C-602 – Multivariate Analysis and Non-Parametric Methods

After completing this course, students should develop an understanding of:

- The understanding of basic concepts associated with Multivariate Normal Distributions and their properties with special emphasis on Bivariate Normal Distribution.
- Analysing Multivariate data using data reduction techniques like Principal Component Analysis, Factor Analysis.
- Classification method namely Discriminant Analysis.
- Application of Wald's SPRT for testing simple null hypothesis vs simple alternative hypothesis along with the study of the O.C. function and the ASN function for various underlying continuous and discrete distributions.
- Testing of hypothesis using Non-Parametric tests like Median test, Runs test, U test, Kruskal Wallis test etc. and ability to use them judiciously for the testing of given data.

## 4.2 Discipline Specific Elective Courses

### STAT-DSE-1 (A) – Time Series Analysis

- The students will possess skills to understand the components of time series analysis.
- The students will possess skills to forecast values of a time series at future time points.
- Understanding of the process generating a time series.
- Forecasting future values of the observed series.

### STAT-DSE-1 (B) – Demography and Vital Statistics

After completing this course, students should develop an understanding of:

- Distinction between Vital Statistics and Demography.
- Errors in Demographic data.
- To check the completeness of registration data using Chandrasekaran-Deming formula.
- Use of Myer's and UN indices in evaluating age data.
- Use of Balancing Equations.
- Population Composition and Dependency Ratio.
- Sources of data collection on Vital Statistics and errors therein.
- Measurement of Population.
- Distinction between Rate and Ratio.
- Basic measures of Mortality.
- Concepts of Stable and Stationary Populations.
- Concept of Life Tables, their construction and uses.
- Concept of Abridged life tables and their construction by Reed and Merrell method Greville's method and King's Method.
- Basic measures of Fertility.
- Measures of Population Growth.

### STAT-DSE-2 (A) – Operations Research

After completing this course, students should develop an understanding of:

- The fundamental concepts of Operational Research Techniques
- Linear Programming.
- Transportation and assignment problems
- Game Theory
- Inventory Models

### STAT-DSE-2 (B) – Econometrics

After completing this course, students should develop an understanding of:

- The fundamental concepts of econometrics.
- Specification of the model.
- Multiple Linear Regression.

- Multicollinearity.
- Heteroscedasticity.
- Autocorrelation.
- Autoregressive and Lag models.

### STAT-DSE-3 (A) – Actuarial Statistics

After completing this course, students should develop an understanding of:

- To learn advanced techniques in Actuarial Science with practical applications in daily life.
- Tools for applying actuarial methods in phenomena for financial research and insurance.
- Tools for applying actuarial methods in phenomena for insurance.
- This includes computation of premiums and settlement of claims.

### STATA-DSE-3 (B) – Biostatistics and Survival Analysis

After completing this course, students should develop an understanding of:

- The fundamental concepts of survival functions and their interrelationship.
- Survival distributions and their applications.
- Handling censored data and estimating mean survival time.
- Actuarial and Kaplan-Meier methods (non-parametric methods).
- Competing Risk Theory. Dependent and independent risk.
- Simple Stochastic epidemic model.
- Basic concept of genetics.
- Need of Clinical drug trials.

### STAT-DSE-4 (A) – Financial Statistics

After completing this course, students should develop an understanding of:

- The fundamental concepts of investments and products of financial markets.
- Derivative markets.
- Continuous time stochastic processes.
- Brownian motion and Wiener process.
- Stochastic calculus and Itô Calculus.
- Stochastic differential equations.
- Black Scholes' model.
- Hedging of financial portfolios.

### STAT-DSE-4 (B) – Project work

- The aim of the course is to initiate students to write and present a statistical report, under the supervision of a faculty, on some area of human interest.
- The project work will provide hands on training to the students to deal with data emanating from some real-life situation.
- It will propel them to dwell on some theory or relate it to some theoretical concepts.

- The project work will provide hands on training to the students to deal with data and relate it to some theoretical concepts.

## 4.3 Generic Elective Courses

### STAT-GE-1 – Statistical Methods

- Introduction to Statistics, definitions and data classification, types of studies and types
- of samples.
- Graphical displays of data, frequency distributions, analysing graphs.
  Numerical descriptions of data, measures of centre tendency, measures of dispersion,
- Skewness and kurtosis.
- Correlation and regression.
- Theory of attributes.

### STAT-GE-2 – Introductory Probability

After completing this course, students should develop an understanding of:

- The fundamental concepts of Probability Theory.
- Solving probabilistic problems.
- Understanding random variables and computing properties of distribution they follow.
- Different probability distributions and their implementation at realistic models.

### STAT-GE-3 – Basics of Statistical Inference

After completing this course, students should develop an understanding of:

- Theory of estimation.
- Tests of hypothesis.
- Application of Chi-square test.
- Nonparametric tests.
- Analysis of variance.
- Fundamentals and analysis of basic designs (CRD, RCBD).
- Bioassay.

### STAT-GE-4 – Applied Statistics

After completing this course, students should develop an understanding of:

- Time series data, components of time series data, study the behaviour and identifying the variation due to different components in the data.
- They will study to identify and measure various components of time series data.

- The fundamental concepts of Index Numbers, Construction of price and quantity Index numbers.
- Construction of Wholesale and Consumer price Index and its significance.
- Statistical Quality Control, Use of Statistical methods in industrial research and practice.
- Chance and Assignable causes of variation in data.
- Statistical process control tools- Control charts for variables and attributes.
- To learn about different demographic methods. Measurement of mortality and fertility rates, reproduction and population growth measures.
- Construction and importance of Life Table.

## 4.4 Skill Enhancement Courses

### STAT-SEC-1 – Data Analysis

- To understand SPSS and its roles in problem solving.
- To understand data handling and its analysis.
- Learning the basic statistical software will help students to easily switch over to any other statistical software in future.
- Students should have developed a clear understanding of SPSS.

### STAT-SEC-1 – Data Analysis using Software Packages (MATLAB)

- Introduce MATLAB, MATLAB programming and
- statistics toolbox.
- Basic programming in MATLAB.
- Ability to solve statistical problems, numerical methods.
- Basic symbolic computations.

### STAT-SEC-2 – Statistical Data Analysis using R

After completing this course, students should develop an understanding of:

- Various Graphical representation and interpretation of data.
- Automated reports giving detailed descriptive statistics.
- Understanding data and fitting suitable distribution.
- Testing of hypothesis, p-value and confidence interval.
- Random number generation and sampling procedures.
- Importing data, Code editing in R and flow controls if (), for (), while ().

### STAT-SEC-3 – Statistical Techniques for Research Methods

After completing this course, students should develop an understanding of:

- Research methodology.
  Research Problem.
- Research Designs.
- Comparative study of different methods of data collection.
- Guidelines for construction of questionnaires.

- Processing and Analysis of data.
- Interpretation and Report writing.

### STAT-SEC-4 – Statistical Simulation Techniques

After completing this course, students should develop an understanding of:

- Use of simulation to understand the behaviour of real-world systems.
- Ability to generate Pseudo-random numbers by the different methods.
- Random variable generation from theoretical distributions.
- Use of Monte Carlo methods and regenerative simulation.
- Ability to develop programs for the purpose of simulation.

## 5. B.A (H) ENGLISH

### 5.1 Core Courses

### PAPER 1 – Indian Classical Literature

- The paper introduces students to a rich and diverse literature from two classical languages of India, Sanskrit and Tamil.
- A key feature is the study of the poetics in the epics of both languages, including their literary traditions and their representations of a pluralist society in terms of linguistic, religious, and generic diversity.
- A key feature is the study of the poetics in the epics of both languages, including their literary traditions and their representations of a pluralist society in terms of linguistic, religious, and generic diversity.
- Optional papers on Indian literature in subsequent semesters will reinforce the centrality of this paper in providing an understanding of key concepts related to the form and content of Indian literatures.

### PAPER 2 – European Classical Literature

- This course provides a humanist foundation to English studies, to be considered essential reading. It enables an exploration of classical Greek, Roman, and Hebrew literature in English translation, tracing its impact and influence on English literature from the period of the Renaissance to the Modern.
- The paper offers a wide-ranging perspective on the aesthetic, philosophical, and social concerns of classical literature.
- It introduces students to multiple genres and forms, including the epic, tragedy, comedy, the lyric, and the dialogue.
- Selections from the Old and New Testament of The Bible provide the context to literary styles and ideas governing Western literature’s interface with the community and its spiritual needs.

## PAPER 3 – Indian Writing in English

- Over the past two centuries and especially after the 1980s Indian writing in English has emerged as a major contribution to Indian—and global—literary production.
- A close analysis of some of the major works of Indian writing in English is crucial in any exploration of modern Indian subjectivities histories and politics.
- It introduces students to Indian English Literature and its major movements and figures through the selected literary texts across genres.
- It enables the students to place these texts within the discourse of post-coloniality and understand Indian literary productions in English in relation to the hegemonic processes of colonialism, neo-colonialism, nationalism and globalization.
- It allows the students to situate this corpus within its various historical and ideological contexts and approach the study of Indian writing in English from the perspectives of multiple Indian subjectivities.

## PAPER 4 – British Poetry and Drama: 14th to 17th Century

- The course introduces students to the tradition of English Literature from the Medieval till the Renaissance.
- It explores the key writers and texts within their historical and intellectual contexts.
- It offers a perspective on the history of ideas including that of disability and its varied meanings within this period.
- The prose readings establish the European context for the Renaissance and offer readings crucial to understanding the sociocultural and religious aspects of the age.

## PAPER 5 – American Literature

- The course aims to acquaint students with the wide and varied literatures of America: literature written by writers of European, particularly English, descent reflecting the complex nature of the society that emerged after the whites settled in America in the 17th century.
- It includes Utopian narrative transcendentalism and the pre- and post- Civil War literature of the 19th century introduce students to the African American experience both ante-bellum and post-bellum reflected in the diversity of literary texts.
- It exposes students to the works of contemporary black woman writers familiarize students with native American literature which voices the angst of a people who were almost entirely wiped out by forced European settlements.
- It also includes modern and contemporary American literature of the 20th century.

## PAPER 6 – Popular Literature

- It enables students to trace the rise of print culture in England, and the emergence of genre fiction and bestsellers.
- It familiarises students with debates about culture, and the delineation of high and low culture.
- The course helps them engage with debates about the canonical and non-canonical, and hence investigate the category of literary and non-literary fiction.
- Students will also engage with issues concerning print culture, bestsellers, and popular literature in other media.

## PAPER 7 – British Poetry and Drama: 17th and 18th Century

- The course helps students explore poetry, drama and prose texts in a range of political, philosophical and cultural material from the end of the Renaissance through the English Civil War and Restoration in the seventeenth century.
- It examines the turmoil about succession and questions on monarchy as they lead up to the civil war, both in drama like Shakespeare and Behn as well as in the poetry of Milton and shows a new interweaving of the sacred and the secular subjects of poetry 17th C.
- It analyses Cartesian dualism that provides a basis for reading ideas of body and mind in the period and after.
- It explores Hobbes's views on materialism and the equality of men, as they are interestingly juxtaposed with his argument for a strong state and his view of man as selfish by nature.
- It shows how Winstanley's writing, on the other hand, brings together Christianity and communality in an argument for equality after the civil war.
- It explores the newness of this century in Cavendish's bold exploration of natural philosophy or science as a domain for women.

## PAPER 8 – British Literature: 18th Century

- The course shows, through a critical examination of Johnson and Gray's poems a continued association with classical poetry, the continuities and contrasts from the age of satire to age of sensibility.
- Study of Fielding's Joseph Andrews providing a brilliant example of the amalgamation of previous genres which made the new genre of the novel, and to look at his indebtedness to Richardson despite the overt satire on Pamela.
- Examine the eighteenth century as a great period for non-fictional forms of writing, drawing attention to the ways in which the periodical essay, for instance, sought to be like philosophy, just as Locke's treatise sought to be like a popular essay, thus pointing out the play with genre in these texts.
- Encourage an extended discussion on the meanings of disability in the early modern period through the Enlightenment, through William Hay's piece on deformity, a response to Bacon.

## PAPER 9 – British Romantic Literature

- The course introduces students to the Romantic period in English literature, a period of lasting importance, since it serves as a critical link between the Enlightenment and Modernist literature.
- It offers a selection of canonical poems and prose that constitute the core texts of the Romantic period.
- It introduces marginal voices that were historically excluded from the canon of British Romantic writers.
- It provides an introduction to important French and German philosophers who influence the British Romantic writers.

## PAPER 10 – British Literature: 19th Century

- This paper focuses on the Victorian period of English literature and covers a large historical span from 1814 to 1900.
- The course introduces students to the Victorian Age in English literature through a selection of novels and poems that exemplify some of the central formal and thematic concerns of the period.
- It focuses on three novels, a major genre of the nineteenth century, so as to show both the formal development of the genre as well as its diverse transactions with the major socio-historic developments of the period.
- It introduces the students, through the readings in Unit 5, to the main intellectual currents of the period.

## PAPER 11 – Women's Writing

This course aims to

- help students understand the social construction of woman by patriarchy;
- examine feminism's concerns of equality with men;
- highlight the structural oppression of women;
- foreground resistance by women;
- discuss women's writing as an act of resistance and of grasping agency;
- facilitate an understanding of the body of woman and its lived experience; and
- help students engage with the heterogeneity of the oppression of women in different places, historically and socially.

## PAPER 12 – British Literature: The Early 20th Century

This course aims to

- develop an understanding among students of the various forms of critique of modernity that evolved in England (and Europe) in the course of the 20th century;
- help students comprehend the path-breaking and avant-garde forms of literary expression and their departures from earlier forms of representations;
- facilitate an understanding of the impact of the two world wars on literary expression and the various political/ideological positions of the European intelligentsia vis-à-vis the phenomenon; and
- create an awareness of new disciplines/areas of inquiry that decisively influenced European art and literature in the 20th century.

## PAPER 13 – Modern European Drama

This course aims to

- provide students with an overview of how modernity was introduced in the twentieth century through drama;
- help students understand the dynamic relationship between actors and audience, and to observe the transition from passive spectatorship to a more active and vital participatory process visible in newer forms in the 1970s;
- examine Ibsen's A Doll's House as it focuses on issues related to women in patriarchal institutions such as marriage;

- look at ideas of alienation in epic theatre, through a study of Brecht's The Good Person of Szechuan, and to link those ideas to Brecht's prose works
- examine Ionesco's play Rhinoceros in the light of his prose writings, Present Past, Past Present.
- sensitise students about feminist interventions in the European theatrical tradition, through Rame's 'Rape' and Fo's Can't Pay, Won't Pay.

### PAPER 14 – Postcolonial Literatures

The paper aims to

- introduce the students to postcolonial theorisations and texts from hitherto colonized regions;
- demonstrate an awareness of the postcolonial situation through the reading of a wide variety of texts;
- familiarize students with of the variety of postcolonial literatures from Africa, Latin America and South Asia and to counter the stereotypes usually associated with assumptions regarding these literatures;
- inculcate adequate knowledge of the importance of gender, class, and caste issues in postcolonial literatures; and
- expose students to various genres of writing: the novel, drama, short stories, prose writings, critical essays and poetry.

## 5.2 Discipline Specific Elective Courses (same for B.A (Prog) English)

### PAPER D1 – Graphic Narratives

This course aims to

- examine major graphic narratives as providing commentary on contemporary culture history and mythology;
- explore visual art as extending translating and providing a new textual vocabulary to narrative including fictional and non-fictional narrative;
- provide exposure to major genres within the field such as that of the mass-circulation superhero the fictionalized autobiography/memoir revisionist narratives of mythological or historical or biographical texts and that of fiction; and
- provide tools for the exploration of form and genre that are sensitive to nuances of race, gender, caste, ethnicity, ableism and sexuality.

### PAPER D2 – Literary Criticism and Theory I

This course aims to

- expose students to the various theories of art and representation, and critical approaches that emerged in Europe throughout centuries;
- to examine the evolution of various theoretical and aesthetic concepts across space and time;
- pay close attention to the method of argument and establishment of concepts; and
- enable students to discern the connections between the theoretical formulations in this paper which are seminal to the understanding of literary texts.

## PAPER D3 – Literature and Caste

- The concept of Caste
- Dalit Literature
- The different genres that engage with caste
- How women experience caste
- How caste is theorised
- Dalit aesthetics

## PAPER D4 – Literature and Mediality

This course aims to

- examine different media and explore how each medium contains a set of possibilities and limits that shape and constitute that which can be communicated;
- introduce debates about the idea of mediation and how the literary gets articulated, both within and at the intersection of different media; and
- study how digital technology is altering the very nature of the literary object
- refashioning the methodologies and function of literary criticism.

## PAPER D5 – Literature for Children and Young Adults

This course aims to

- help students trace the emergence of the genre termed Children's Fiction
- link it to the emergence of other genres as print culture has grown;
- familiarize students with the idea of visual literacy, illustrations, etc., and their application and use in children's picture books; and
- facilitate an engagement with the concept of Young Adult Literature and issues associated with it.

## PAPER D6 – Literatures of Diaspora

This course aims to

- provide students with preliminary knowledge on the intrinsic connection between literature and diaspora;
- help them acquire a set of basic skills in literary communication, narration and explication of diasporic practises and processes;
- enable an appreciation of the global intersectionalities stemming out of increased migration and cross-cultural living, culminating into diasporic practices;
- inculcate in students the ability to read and understand various literary genres of diaspora;
- analyse the writings of diverse authors representing the world's major diasporic communities; and
- help students decipher the literary features and push and pull factors of Jewish, SouthAsian, American Chicano, Armenian, Fiji, British Canadian, Gulf, Malaysian, European, Philippino, and Chinese diasporic writings.

## PAPER D7 – Interrogating Queerness

This paper aims to

- enable students to examine several key themes including love, desire, identity, gender, masculinity, femininity, family/kinship, deviance, sexuality, power, normativities and resistance to these normatives;
- help students follow the concept of queerness as an interrogation of heteronormativity through its representation in diverse cultural historical and geographic landscapes, to examine how normative structures are constituted and subverted; and
- use materials from diverse creative traditions, including mainstream and non-marginal texts in mythology, fiction, and poetry to familiarise students with the idea that normative structures of desire are themselves heterogeneous social constructs that change over time.

## PAPER D8 – Modern Indian Writing in English Translation

This paper aims to

- give students a glimpse of the vast diversity of modern Indian writing in bhasha traditions;
- show students the polyphonic tumultuous richness of the 19th and 20th centuries, from peasant life in colonial India in Fakir Mohan Senapati's novel to the mythical reality of O.V. Vijayan's novel, from the reworking of a Mahabharata story in Girish Karnad's play to the myriad life-worlds of the poems and stories; and
- encourage, through the carefully selected poems, stories and prose selections, a deeper engagement with and
- nuanced discussion of issues of history, memory, caste, gender and resistance.

## PAPER D9 – 19th Century European Realism

This course aims to

- acquaint the student with realism as an historically and culturally specific mode of representation, obtainable from the study of novels in nineteenth-century Europe
- allow the student an opportunity to see critical connections between nineteenth-century European aesthetics, and
- epistemological and political debates around reality and historical change; and
- offer a wider comparatist perspective on the emergence of the novel as the dominant genre of literary expression in nineteenth-century Europe.

## PAPER D10 – Pre-Colonial Indian Literatures

This course aims to

- introduce students to the culturally and evocatively rich literatures of pre-colonial early modern India;
- explore concepts of devotional and secular love through Bhakti and Sufi poetry, indigenous forms of narratives and story-telling through Kathas and Dastans, and the gendered reworking of myths and histories through women's narratives;
- introduce a bridge between classical and modern Indian literatures; and

- engage with the continuities as well as breaks among different narrative and verse traditions of Indian literature.

## PAPER D11 – African Literatures

This course aims to

- introduce students to a detailed analysis of African literatures in different genres; and
- chart the distinctive position that African literatures have today in the postcolonial world.
- This course is for students who may wish to engage further with African literatures while studying the Core Postcolonial Literatures paper.
- These questions are answered by engaging with a variety of texts from the continent, some written originally in English while others available today in translations.

## PAPER D12 – Latin American Literature

This course aims to

- critically engage with innovation in form, voice, representation and various modes of storytelling that are specific to Latin American literature but are relevant to students of literary studies as it has impacted global literatures;
- examine how the experimentation in terms of form and perspective engages with questions of identity, dissidence, resistance and recuperation, and resonates with the colonial and postcolonial histories and literatures of developing worlds; and
- critically examine issues of race, class, gender, culture and identity, in order to understand the evolving character of Latin American society and
- trace its resonances with literatures of the global South, particularly with reference to India.

## PAPER D13 – Literary Criticism and Theory II

The course aims to

- expose students to the history of ideas in the twentieth century and the material and discursive conditions of intellectual production;
- encourage students to grapple with literary studies, from a privileging of form to an interdisciplinary engagement with the literary text;
  help students develop a critical wherewithal which would enable them to engage with a literary text from multiple pedagogical entry-points; and
- have students closely examine the methods of argument and rhetorical constructions through which important theoretical ideas and concepts have been established and made to impact the field of cultural production in the West.

## PAPER D14 – Literature and Cinema

- This course examines the close relationship between literature and cinema by studying the points of contact of literary and cinematic praxis.
- It equips students in a practical sense for understanding the cinematic medium.
- It examines cinema as an art employing different time frames, situations, literary cultures and other media/forms to compose itself as a text.

- It provides a theoretical framework to strengthen the awareness about intertextuality and the convergence between the modes of literature and cinema.

## PAPER D15 – Literature and Disability

- Help students approach literature through the lens of disability and enable them to develop a fresh critical perspective for reading literary representations.
- Enable them to explore various forms of literary representations of disability, in order to become aware of the different ways in which disability figures and operates in a literary narrative.
- Inculcate in them an approach to disability based on notions of intersectionality -- that is, to understand the experience of disablement in conjunction with other forms of marginalised identities.
- Introduce the undergraduate student to the fundamental tenets of literary and cultural disability studies, with the professed intention of bringing about a change in the way that we have been traditionally responding to disability and disabled people.

## PAPER D16 – Partition Literature

This paper aims to

- enable an understanding of the affective dimensions of the Partition in varied geopolitical spaces;
- aid the student in comprehending the country's postcolonial realities; and
- introduce students to the following topics through the study of literary texts: colonialism, nationalisms and the Partition of India in 1947, communalism, violence and the British Rule in India, homelessness, exile and migration, women and children in the Partition, refugees, rehabilitation and resettlement, borders and borderlands.
- The paper encompasses literatures from Punjab, Pakistan, West Bengal, the Northeast and Bangladesh, through varied genres: memoirs, short stories and the novel, along with theoretical background reading materials.

## PAPER D17 – Speculative Fiction and Detective Literature

This course aims to

- investigate the categories of literature termed, 'speculative fiction' and 'detective literature', and the social and philosophical issues associated with them;
- help students engage with questions about the idea of 'progress', and the role of science and technology in human life; and
- encourage students to explore the meaning of hitherto naturalized terms such as 'crime' and 'human/humanity'.
- Familiarize students with both genres and explore the changing nature of crime and detection as well as issues of citizenship and bioethics through the prescribed readings.

## PAPER D18 – Studies in Modern Indian Performance Traditions

This course aims to

- provide an overview of the varied performance traditions in modern India;
- enable students to understand the significant mediations made by theatre at crucial moments in history;
- show how each of the plays in this course functions as a historical marker, bringing in new insights into an understanding of theatre and life; and
- introduce the student to the dynamic structure of the street play.

### PAPER D19 – 20th Century European Fiction

This course aims to

- acquaint students with the main currents of fiction in twentieth-century Europe;
- help develop an understanding of Europe as a cultural idea represented, debated and questioned in the fictions of the twentieth century;
- compare a variety of literary responses to the socio-political forces of change, and ideologies that impinged on the lives of people in different regions of Europe in the twentieth century; and
- allow the student to reflect on the situation of the European writer as a cultural spokesperson, yet in a state of perpetual exile physically displaced and metaphorically distanced from the established centres of cultural power.

### PAPER D20 – Research Methodology

This course aims to

- familiarize students with the idea of research and the methodologies associated with it;
- train students to draft research proposals, and become familiar with various style manuals;
- help students practice and create annotated bibliographies and become aware of issues about plagiarism; and
- enable them to research and write a final research essay.

## 5.3 Generic Elective Courses (same for B.A (Prog) English)

### PAPER G1 – Academic Writing and Composition

- This course is designed to help undergraduate students develop and research composition, argument, and writing skills.
- It will enable them to improve their written abilities for higher studies and academic endeavours.
- It makes them understand concepts and express them through writing.
- It helps in demonstrating conceptual and textual understanding in tests and exams.

### PAPER G2 – Media and Communication Skills

- This is an introductory course in the role of media today – India and globally.
- It will equip students with the basic theories on various aspects of media and impart training in basic writing skills required in the profession.

- It makes them understand concepts and express them through writing.
- It helps in demonstrating conceptual and textual understanding in tests and exams.

### PAPER G3 – Text and Performance: Indian Performance, Theories and Practices

- This course on Text and Performance combines Indian theories of dramaturgy along with a practical understanding of the stage.
- These range from the classical theories of Rasa to the more modern ones that emerged in the twentieth century.
- It will acquaint the students with the rise of modern theatre in the pre- and post-independence period in India.
- It also familiarises them with folk theatrical traditions.

### PAPER G4 – Language and Linguistics

- The course introduces students to, and familiarises them with, the basic concepts of language and linguistic theories.
- They are also exposed to language and communication, language varieties, standard and non-standard language.
- It includes Structuralism, Phonology and Morphology.
- It also covers Syntax and semantics: categories and constituents phrase structure maxims of conversation.

### PAPER G5 – Readings on Indian Diversities and Literary Movements

- This course seeks to equip students with an overview of the development of literatures in India.
- It also exposes students to India's wide linguistic diversity.
- Students will study authors and movements from different regions and time periods.
- It includes language politics and various literary cultures.

### PAPER G6 – Contemporary India: Women and Empowerment

The course will help students

- read, understand and examine closely narratives that seek to represent women, femininities and, by extension, gendering itself;
- understand how gender norms intersect with other norms, such as those of caste, race, religion and community to create further specific forms of privilege and oppression;
- identify how gendered practices influence and shape knowledge production and circulation of such knowledges, including legal, sociological, and scientific discourses;
- participate in challenging gendered practices that reinforce discrimination; and
- Create a portfolio of analytical work (interpretations and readings of literary and social-sciences texts) and analyses of fictional and non-fictional narratives that students encounter in their lived worlds.

## PAPER G7 – Language, Literature and Culture

- This course is designed to introduce the students to the basic concepts of language, its characteristics, its structure and how it functions.
- The course further aims to familiarise the students with how language is influenced by the socio-political-economic-cultural realities of society.
- It also acquaints students with the relation between language and literature.
- Students will demonstrate conceptual and textual understanding in tests and exams.

## PAPER G8 – Comic Books and Graphic Novels

This course aims to

- introduce graphic narrative to students of non-literary studies backgrounds;
- provide a toolkit for them to acquire visual literacy and thus to equip them to better understand popular public cultures;
- examine how major graphic narratives comment on contemporary culture history and mythology;
- provide visual literacy tools through examining visual arts, as extending translating and providing a new textual vocabulary to narrative, including fictional and nonfictional narrative;
- provide exposure to major genres within the field, such as that of the mass-circulation 'comic' book, the fictionalized autobiography/memoir biographical texts, and that of fiction;
- provide tools for the exploration of form and genre that are sensitive to nuances of race, gender, caste, ethnicity, ableism and sexuality; and
- enable students from backgrounds in subjects other than English literary studies to broaden their skill-sets in textual interpretation, reading, and writing about texts.

## PAPER G9 – Cinematic Adaptations of Literary Texts

- Students will engage with the relationship between text and film and examine the contexts of film production in global film industries, including Hollywood and Bollywood.
- As an elective English studies paper, the core focus is textual study and interpretative work, wherein the student gains skills in studying Shakespeare as much as in the language of film via appreciation of its specific features as a medium.
- The paper will focus on reception and critical work and history through the comparative framework, to examine the different contexts of production of the play and the films.
- This paper will equip students from non-English studies backgrounds to explore the language of cinema, through their study of a canonical literary text.

## PAPER G10 – Indian English Literatures

This course aims to

- introduce students to Indian English literature and its oeuvre through the selected literary texts across genres;

- enable the students to place these texts within the discourse of post coloniality and understand Indian literary productions in English in relation to the hegemonic processes of colonialism, neo-colonialism, nationalism and globalization; and
- allow the students to situate this corpus within its various historical and ideological contexts and approach the study of Indian writing in English from the perspectives of multiple Indian subjectivities.
- A close analysis of some of the major works of Indian writing in English is crucial in any exploration of modern Indian subjectivities, histories and politics.

## PAPER G11 – Bestsellers and Genre Fiction

The paper aims to

- promote an understanding of popular literature as a socially relevant and pleasurable form of writing, which engages with contemporary issues;
- encourage students to question the categories of 'high' and 'low' literature and issues concerning 'popular culture'; and
- explore the social and cultural relevance of popular texts and bestsellers, as products of their time and age, mirroring the aspirations and anxieties of the society and class of their readership.
- Various genres, such as writing for children and young adults, detective fiction, and modern mythology, which are considered popular, are included here.

## PAPER G12 – Culture and Theory

- This course presents key theories seminal to the development of culture in the twentieth century.
- It combines a theoretical base with its practical application to literature.
- It focuses on the construction of culture in society and its application to the simplest aspects of life.
- The literary texts have been selected carefully to comprehend the connections between culture, literature and life.

## PAPER G13 – Marginalities in Indian Writing

This paper intends to

- make undergraduate students approach literature through the lens of varied identity positions and evolve in them a fresh critical perspective for reading literary representations;
- enable them to explore various forms of literary representations of marginalisation as well as writing from outside what is the generally familiar terrain of Indian writing in schools;
- make them aware of the different ways in which literary narratives are shaped, especially since some of the texts draw on traditions of the oral mythic folk and the form of life-narrative as stylistics;
- make them understand how literature is used also to negotiate and interrogate this hegemony; and
- evolve an alternative conception of corporeal and subjective difference.

### PAPER G14 – The Individual and Society

- This anthology introduces students to the various issues that face society today – caste, class, race, gender violence, and globalization.
- It serves as an effective entry point to an understanding of these areas that students will encounter in their higher studies and daily lives.
- It aims to provide them with a holistic understanding of these issues and their complexities.
- It demonstrates conceptual and textual understanding in tests and exams.

### PAPER G15 – Text and Performance: Western Performance Theories and Practice

- This course combines modern Western theatrical concepts along with the praxis of performance.
- It will familiarise students with the seminal Western theories of performance in the twentieth century and their visualisation on stage. The course will focus on a historical understanding of the different types of theatrical spaces along with their bearing on performance.
- A practice-based course, it will focus on techniques such as voice modulation and body movement.
- A designated unit towards production will help students understand the different aspects involved in theatrical production.

### PAPER G16 – Literature and the Contemporary World

- This course seeks to introduce students to various genres of contemporary literature, through works that are familiar and have established themselves in the popular parlance.
- These texts will be studied from various prisms – class, gender, race, etc.
- It will equip students with an understanding of the linkages between literature history and society in our times.
- It demonstrates conceptual and textual understanding in tests and exams.

## 5.4 Skill Enhancement Courses (same for B.A (Prog) English)

### PAPER S1 – Analytical Reading and Writing

At the end of this course, we expect the students to

- consider the act of writing as a goal-oriented task, oriented towards the goal of persuasion;
- identify the writer's central purpose or thesis;
- identify their own historical social and personal contexts to understand their own biases and ideologies;
- gather information and to notionally organize material required to address that topic or to answer that question;
- finally produce a paper that follows the guidelines of their own theses and outlines; and

- use the appeals of ethos, logos and pathos throughout the paper as multiple persuasive strategies.

## PAPER S2 – Literature in Social Spaces

- Students will be familiarised with the link between the Humanities and, 'soft skills'
- They will be encouraged to focus on the value of literature as an empathy-building experience.
- They will learn to apply critical thinking and problem-solving skills developed by the study of literature to personal social and professional situations.
- Students will be encouraged to enhance their teamwork skills by working in groups and to understand the processes of leadership and mentoring.
- Students will work on their presentation skills and build on the idea of, 'narratives', to better communicate with target audiences.

## PAPER S3 – Literature in Cross-Cultural Encounters

This course aims to help students

- develop skills of textual and cultural analysis;
- develop insights into and interpretations of complex cultural positions and identities; and
- pay specific attention to the use of language and choice of form/genre that affects the production and reception of meaning between writers and readers.
- engage with experiences of people from varying cultures and backgrounds, particularly relevant in contemporary times as these issues continue to be negotiated in the workplace as well as larger society.

## PAPER S4 – Oral Aural and Visual Rhetoric

In this course, students will

- develop their oral/aural/visual senses to appreciate a cultural text, while at the same time using a theoretical framework and position to read a text; and
- identify and engage with the themes of argumentation and persuasion.
- identify and engage in Language and writing.
- identify and engage with Intention and motivation of the author/orator/painter/musician.
- Identify and engage with emotive element in speech and music and performative language.

## PAPER S5 – Introduction to Creative Writing for Media

This course aims to

- introduce students to the idea that creativity is a complex and varied phenomenon that has an important relationship with social change;
- familiarize students with ideas about language varieties and the nuances of language usage;

- introduce students to the language and types of media writing across forms and genres; and
- encourage students to revise their work critically and inculcate the skills of proofreading

## PAPER S6 – Translation Studies

The student will develop the ability to

- sensitively translate literary and non-literary texts including official and technical documents from one language to another; and interpret from one language to another;
- examine what is translated and why;
- discern the difference in language systems through the practice of translation; and understand the processes involved in translation in mass media, especially news reporting, advertising and films;
- engage with the demands of subtitling and dubbing; and compare translations;
- evaluate and assess translated texts; and edit translated texts.

## PAPER S7 – Introduction to Theatre and Performance

Through this course, students will be able to

- understand the different theories of drama in Europe and India, both from the point of view of theory and performance;
- make connections between socio-economic processes at work
- emerge a certain kind of dynamic within theatre; and
- put up a performance at the end of the course, making use of the different kinds of aesthetics they have studied (since this is a Skill Enhancement Course)

## PAPER S8 – Modes of Creative Writing – Poetry, Fiction and Drama

Through this course, students will

- be introduced to a variety of tropes and figures of speech, and sensitised to the texture of literary language;
- understand the importance of reading with a view to unlocking the writers' craft;
- be introduced to various forms of poetry, fiction and drama and the wide range of possible genres within them;
- be made aware of the range of career opportunities that exist within the field of creative writing as well as within the realm of theatre and performance; and
- be encouraged to revise their work critically and inculcate the skills of editing and preparing their work for publication.

## PAPER S9 – English Language Teaching

The course intends to enable students to

- recognize the role of affect in language learning, and account for individual differences among learners in regard to motivation and attitude, personality factors, and cognitive styles;

- identify and adapt to the needs and expectations of the learner; and be aware of the significant and current approaches in the fields of cognition and language pedagogy;
- understand the importance of teaching materials (in relation to the teaching-learning context and their teaching purposes);
- recognise the importance of planning in ELT and develop lessons in the framework of a planned strategy adapted to learners' levels;
- strengthen concepts of the fundamentals of the English language; and understand the need for assessment and devise techniques for an evaluation plan that is integrated into the learning process.

### PAPER S10 – Film Studies

This course will enable students to

- examine those specific features of composition that help create films: camera, sound, script, and editing will be studied, so that students learn the elements of putting a film together
- study cinema as a form with history and context, tracing genres and geographies, examining legacies, and exploring potential renewals;
- take up work in the medium, to write and review films so as to generate a repertoire of analyses and interpretations;
- engage in projects and/or practical work; and
- build up a portfolio of work through practice of the discipline.

### PAPER S11 – Applied Gender Studies: Media Literacies

This course will enable students to

- identify, read closely, and rewrite narratives of gendered privilege in contemporary Indian popular representation;
- examine the intersections of gender with other categories like caste, race, etc., to understand how different forms of privilege/oppression; and resistance/subversion interact in heterogeneous and variable formations; and
- focused on practical application, creating, over the duration of the course, a portfolio of interpretative work that analyses fictional and non-fictional mass medium narratives and
- that can serve as foundations/sourcebooks for intervention to reduce gender discrimination through media literacy.

## 6. B.A (H) HINDUSTANI MUSIC

### 6.1 Core Courses

### COURSE 101 – General Theory

- The student will come to know what the basic terminologies of Indian music which will help him in the proper understanding of not just Hindustani music, but also Indian music as a whole. Having understood the basic concepts like Laya (tempo),

Tala (rhythmic cycle), Raga, Alap (tonal elaborations), the student will be on course to becoming a performing artiste in Hindustani music.

- The student will develop the ability to read and write the notations of compositions according to a well-defined notion system, which in turn, will help him in learning new compositions by various composers of Hindustani music.
- They will grasp the various theoretical aspects of the prescribed ragas, like how it arises, what are the general grammatical rules that govern the ragas in this course, etc.
- They come to understand the concept of Tala and the use of various talas in Hindustani music, especially ragas.

### COURSE 101 – Practical: Stage Performance and Viva

- The student will become well-versed with the techniques of singing or playing, as the case may be.
- The student will be able to achieve dexterity of the voice (singing) and hand (playing), through regular practice of the tonal exercises at home.
  The students will know how to tune their respective instruments – Tanpura for vocal students, and Sitar, Sarod etc. for instrumental students.
- Having learnt the Notation system in the Theory, the student will able to read and learn new compositions in the prescribed ragas.
- He will grasp the various grammatical aspects of the prescribed ragas, like how they arise, what are the respective rules that govern these ragas, how do the notes move in the ragas, what are the performing times of the ragas etc.
- He will learn the art of singing or playing, especially with regard to having the Tabla as an accompanying instrument.
- He will possess a fairly good idea of how a raga is to be performed after learning the basic ragas.

### COURSE 201 – Theory of Indian Music

- The student will come to know how ragas were performed in ancient times.
- He will learn the principles governing the Time Theory of Ragas, in that every raga is to be performed according to a designated time. This will enhance his understanding of the raga and their associated moods.
- The student will appreciate the pioneering work done by the aforementioned legends of Hindustani music, and how the state of modern music is a direct result of their tireless efforts in reviving the dying art.
- The student will be able to read compositions written in Western notation system and will also be able to make a comparative analysis with the notation system of Hindustani music.

### COURSE 202 – Practical: Stage Performance and Viva

- The basics of the student will get further strengthened.
- The student will start to gain self-belief, and make attempts to improvise while performing a raga.
  The student will begin to gain some command over increasingly complex talas.
- With other basic ragas, the student will understand how to use the flat and sharp notes in ragas with varied tonal phrases.

- He will gain confidence with the Tabla accompanying him in performances of larger time-duration.

### COURSE 301 – Historical Study of Indian Music

- The student will come to know about the origin of many current musical forms of singing in Hindustani music, such as Dhrupad, Dhamar and Khayal. This knowledge is useful for further study of musicology as well as for purposes of research.
- He will understand how various musical instruments of India are made, and are categorized on the basis of solids, animal skin, wind and metallic strings. This will enhance his knowledge, and will be beneficial in future research on musical instruments.
- He will gain valuable knowledge on the various musical forms, as they existed in ancient India, and how they gave rise to some of the musical forms that are sung today, such as Dhrupad, Dhamar and Khayal.
- The student will gain parallel knowledge about the musical forms of Karnatak music, which will be useful not only while hearing a Karnatak concert, but also for the purpose of comparative research.

### COURSE 302 – Practical: Stage Performance

- The student will develop the confidence to perform a raga for a long duration of time.
- The student will be able to sing new compositions in new talas.
- It will focus more on the Stage Performance of the student.
- It will encourage the student to attempt to improvise while singing/playing.

### COURSE 303 – Practical: Viva-voce

- The student will be able to explain the grammatical rules of a raga in detail.
  He will develop the confidence to differentiate between similar ragas.
- The student will be able to sing new compositions in new talas.
- The student will learn new compositions based on various talas.

### COURSE 401 – Life and Contribution of Musicians

- The student will come to know about the works of the Karnatak music composers, popularly known as Trinity.
- He will be able to comprehend the magnitude of the many works and compositions of the famous Western composers like Beethoven and Mozart.
- The student will know about the life and contribution of legends like Amir Khusrau and Tansen.
- They will learn how their works have shaped the present Hindustani music.

### COURSE 402 – Practical: Stage Performance

- The student will develop the confidence to perform a raga for a long duration of time.
- The student will be able to demonstrate the finer nuances of raga in a detailed performance.

- The student will have the opportunity to showcase his skill in semi-classical and folk genres of music.
- They will focus on his learning of newer talas.

### COURSE 403 – Practical: Viva-voce

- The student will be able to explain the grammatical rules of a raga in detail.
- He will develop the confidence to differentiate between similar ragas.
- The student will be able to sing new compositions in new talas.
- They will learn new compositions based on various talas.

### COURSE 501 – Theory – History of Indian Music

- The student will come to know about Indian music during the Vedic times. He will thus understand its progress and development from then to now.
- It will enhance his knowledge in the field of musicology, and also help him in the field of research in ancient Indian music.
- He will understand how music was sung and played during the times of Ramayana and Mahabharata.
- He will gain knowledge about the works of medieval authors, and understand how the svara systems and ragas have evolved to their modern-day avatars.

### COURSE 502 – Practical: Stage Performance and Viva

- The student will gain self-belief in performing a raga, after practising its finer details.
- He will also be able to demonstrate how to separate similar sounding ragas.
- He will be able to sing Dhrupad and Dhamar with an in-depth knowledge of its style of performance.
- It will encourage the students to think and perform like an artiste, with thoughtful and aesthetic improvisations.

### COURSE 601 – Theory – Applied Theory

- The student will come to know about the salient features of the Gharana system, as also the specialities of prominent gharanas like Gwalior, Agra, Delhi gharanas etc.
- The student will gain knowledge about the various styles of playing instrumental music, that will help him to enjoy the concerts, and will also encourage him to carry out research on the styles of various musical instruments of Hindustani music.
- The student will come to know about the various musical forms of vocal music, such as Khayal, Tarana and Thumri. This knowledge will help him to become a better stage performer of Hindustani music.
- He will finish his education in graduation with a complete knowledge of twenty-six ragas, spanning all the six semesters.

### COURSE 602 – Practical – Stage Performance and Viva

- He will have the knowledge of twenty-six ragas that he has learnt in all the six semesters combined.
- He will be able to perform complex ragas with self-confidence.

- He will be able to differentiate between similar sounding ragas of all the semesters.
- The student will have thorough knowledge of all the talas that he has learnt in the last five semesters.

## 6.2 Discipline Specific Elective Courses (For B.A (H) Karnatak Music also)

### COURSE HV503 – Theory – Theory of Indian Music

- The students understand the basic ideas of ragas through Sargam, Sargam geet, Alap, Tana and various musical forms.
- The students enhance the ability to demonstrate the concept of Teen taal and Ek taal through different speed or Layakari.
- This helps the students of other disciplines to obtain theoretical and practical skills and idea to maintain a holistic approach in Music.
- This enhances the student skill to face the challenges at their workplace too.

### COURSE HV504 – Practical: Stage Performance and Viva

- The students gain knowledge of the Time theory in Hindustani music and its importance in the musical rendition.
- The students learn to demonstrate elementary concepts of raga classification and also a brief about notation system in Hindustani music.
- The students understand the characteristics of selected Raga of the unit.
- This helps the students of other disciplines to obtain theoretical as well as practical skills and idea to maintain a holistic approach in Music.

### COURSE ST505 – Theory – Theory of Indian Music

- Gain knowledge of the time theory in Hindustani music and its importance in the musical rendition
- Ability to demonstrate elementary concepts of raga classification and also a brief about notation system in Hindustani music
- The student understands the characteristics of selected Raga of the unit.
- The course provides better understanding about notation system and prescribed Ragas.

### COURSE ST506 – Practical: Stage Performance and Viva

- Ability to demonstrate basic Alankars of Hindustani music and playing techniques.
- The student understands the basic ideas of ragas through two Razakhani gats, prescribed in the elective I
- Ability to demonstrate the concept of Teental and Ektal through different degrees of speed.
- Smooth movements of both the hands is the primary objective of the course.

## COURSE TB507 – Theory: Tala System

- The students of this course get to know the Structure, Tuning, Syllables and playing techniques of Tabla/Pakhawaj.
- The students get the knowledge of the following technical terms- Laya, Taal, Matra, Theka, Tali, Khali, Vibhag, Sam, Avartan, ,Thah, Dugun, Tigun, Chaugun, Peshkaar, Uthaan, Kayada, Rela, Palta, Mukhda, Tukda, Paran, Tihai.
- The students learn about different talas like Teentala, Ektala, Choutala, Dhamar.
- Students get to learn the notation system given by Pt. V.N. Bhatkhande.
- Students develop the ability to write notations of Theka and composition in prescribed talas with Dugun, Tigun and Chaugun.

## COURSE TB508 - Practical: Stage Performance and Viva

- The students of this course get to know the various syllables and playing techniques of Tabla/Pakhawaj.
- The students are taught to keep in mind the aesthetics of both the tala, playing style, clarity of bols and the overall performance in the mind at all times.
- The students learn the different Varnas (Bol) of Tabla & Pakhawaj.
- Students develop the ability to play,'TeTe', 'Tirakit'/ 'Dhumkit' compositions of Tabla/Pakhawaj along with 'Tukdas' and 'Parans' of Tabla/Pakhawaj.

## COURSE KV509 – Theory – An Appreciation of Karnatak Music

- Students will gain knowledge of the basic terminologies of Karnatak music and its importance in the musical rendition.
- Ability to demonstrate elementary concepts of mela and raga classification.
- The student will understand the characteristics of selected Raga of the unit and to notate musical form geetam.
- They will learn basic concepts of Karnatak music notation.

## COURSE KV510 - Practical: Stage Performance and Viva

- Students will able to to demonstrate the preliminary lessons of Karnatak Music.
- The student will understand the simple talas through Alankaras and geetams.
- Ability to give a brief shade of ragas through musical forms- swarajati and varnam.
- They will learn the basic concepts of the tala of Karnatak Music and musical forms.

## COURSE VV511 – Basic Theory of Karnatak Music

- Gain knowledge of the basic terminologies of Karnatak music as well as tuning and structure of respective musical instrument.
- Ability to demonstrate elementary concepts of mela and raga classification.
- The student understands the characteristics of selected Raga of the unit.
- Gain basic knowledge of musical forms – Geetam, Varnam and kriti

## COURSE VV512 - Practical: Stage Performance and Viva

- Ability to demonstrate basic playing techniques of the respective instrument.
- Gain knowledge to demonstrate the preliminary lessons on Karnatak Music.

- The student understands the simple talas through Alankaras and geetams of different degree of speed.
- They will learn the basic concepts of the tala of Karnatak Music and musical forms.

### COURSE HV603 - Practical: Stage Performance and Viva

- The students enhance the ability to describe advanced alankars in prescribed ragas in the unit.
- The students become capable of demonstrating characteristics of ragas, its elaboration and structures through prescribed ragas in the Elective III.
- The students learn to demonstrate the concept of Jhap taal and Rupak taal through different degrees of speed.
- This enhances the student skill to face the challenges at their workplace too.

### COURSE HV604 – Project Work

- It helps to understand the basic concepts of Research methodologies.
- The students understand the importance of reading skills as well as writing skills to develop his/her rational approach towards research activities.
- The students gain knowledge about the life and contribution of various musicians and musicologists etc. through specific project work.
- It helps the students of other disciplines to obtain theoretical and practical skills and idea to maintain a holistic approach in Music.

### COURSE ST605 - Practical: Stage Performance and Viva

- Ability to describe advanced alankars in prescribed ragas in the unit.
- Capability to demonstrate characteristics of ragas, its elaboration and structures through prescribed Gats in the elective III.
- Ability to demonstrate the concept of Jhap tal and Rupak tal through different degrees of speed.
- This helps the students of other disciplines to acquire theoretical and practical skills and idea about the chronological sequence of Sitar Playing, thus giving them a holistic approach in Music.

### COURSE ST606 – Project Work

- Gain knowledge about the life and contribution of various musicians and musicologists through specific project work.
- It helps to understand the basics of research methodology.
- The student understands the importance of reading skills as well as writing skills to develop his/her rational approach towards research activities.
- This contributes to the writing skills of the students for their future research projects.

### COURSE TB607 - Practical: Stage Performance and Viva

- The students of this course get the knowledge of playing the Theka of Jhaptala/Sultala.

- Students learn about 'Te Te', 'Tirakit'/'Dhumkit' compositions with variations, SadharanTukda, Paran and Tihai in Jhaptala/Sultala.
- The students develop the ability to play Theka with Thah, Dugun, Tigun and Chougun in Rupak Tala/Tevra Tala.
- The students learn about the accompaniment with Chhota Khayal/Dhrupad and Bhajan.

## COURSE TB608 – Project Work

- The students learn to carry out research on the life and contribution of various musicians and musicologists and present the collected data and material in the form of a well-prepared report/brief dissertation.
- The students get to know the approach and process of research, beneficial in M.Phil. and Ph.D. programmes later.
- The main focus of the project work is to groom and improve student's level in writings as well as reading skills.
- The project work helps gaining in-depth study on the chosen topic and to help students understands the basic research methodologies.

## COURSE KV609 - Practical: Stage Performance and Viva

- Ability to demonstrate the seven basic talas through Alankaras and geetams.
- Gain knowledge of ragas and structures of musical forms through kriti and varnam.
- The main focus is to study the simple musical forms and Talas.
- To study the concept of rendering /bowing musical exercises in various speed.

## COURSE KV610 – Project Work

- Ability to demonstrate basic of research methodologies.
- The student understands the importance of reading skills as well as writing skills.
- The main focus of the project work is to groom and improve student's level in writings as well as reading skills.
- The project work helps gaining in-depth study on the chosen topic and to help students understands the basic research methodologies.

## COURSE VV611 - Practical: Stage Performance and Viva

- Ability to demonstrate the seven basic talas through Alankaras and geetams.
- Gain knowledge of ragas and structures of musical forms through kriti and varnam.
- The main focus is to study the simple musical forms and Talas.
- To study the concept of rendering musical exercises in various speed.

## COURSE VV612 – Project Work

- Ability to demonstrate basic of research methodologies.
- The student understands the importance of reading skills as well as writing skills.
- The main focus of the project work is to groom and improve student's level in writings as well as reading skills.

- The project work helps gaining in-depth study on the chosen topic and to help students understands the basic research methodologies.

## 6.3 Skill Enhancement Courses (For B.A (H) Karnatak Music also)

### COURSE TD304 – Theory of Thumri-Dadra

- Students learn and understand the various styles of thumries.
- Students learn and able to write the notation of Thumri and Dadra.
- Students learn the description of prescribed Ragas.
- Writing of Talas with various layakaries in Notation.
- Students learn about the tuning of Tanpura.

### COURSE TD305 - Practical: Stage Performance and Viva

- Students learn the introduction of two styles of Thumri singing.
- Students know and are able to demonstrate the prescribed Ragas.
- Students learn and are able to demonstrate one Thumri & one Dadra in Prescribed Ragas.
- Students learn to demonstrate the various talas and their layakaries.
- Students learn the skill to tune the Tanpura.
- Students are able to demonstrate Thumri & Dadra for not less than 20 minutes.

### COURSE HA306 – Theory: Origin, Development and Utility of Harmonium in Indian Music

- Students get to know the history of harmonium and its development in Indian music.
- Students learn to write alankaras with respective finger techniques.
- Students learn the definition of various basic terms used in harmonium.
- Students learn to write the notation of composition.
- Students get to know the description of prescribed Ragas.
- Students learn to write the notation of Talas with layakaries.

### COURSE HA307 - Practical: Stage Performance and Viva

- Structural details of the harmonium & its various parts.
- Various finger techniques in Harmonium playing.
- Students develop the ability to demonstrate alankaras practically.
- Various Ragas & Talas.
- Gradually, the students develop the ability to play fast compositions in various ragas with elaborations.

### COURSE TB308 – Theory: Tala System

- Knowledge of the brief history of Tabla / Pakhawaj.
- Knowledge of the Varnas (Bol) of Tabla / Pakhawaj.
- Ability to write in notation the Theka of Teentaal/Chautaal with layakari.
- Ability to write in notation of various compositions in Teentaal/Chautaal.
- Knowledge about the accompaniment of Vocal and Instrumental Music.

- Knowledge about Ektaal/Chautala.

### COURSE TB309 - Practical: Stage Performance and Viva

- Knowledge about playing techniques of basic Bols, Varna , Nikas of Tabla/Pakhawaj.
- Knowledge about the Thekas of talas with Thah, Dugun and Chaugun layakaries.
- Ability to demonstrate various Kayda/Rela compositions in Teentaal/Chautaal.
- Knowledge of Keherwa and Dadra or Tivra and Sooltaal Talas.
- Basic knowledge about accompaniment with Vocal & Instrumental music in different Taalas.
- Knowledge about tuning of Tabla/Pakhawaj.

### COURSE MD310 – Theory: Technical Terminologies and Concepts of Tala and Laya

- Gain knowledge of technical terminology of the instrument opted for.
- Understand the concept of Tala, Laya, different parts of the instruments and basic notations.
- Gain knowledge of technical terminology of the instrument opted for.
- Understand the concept of Tala, Laya, different parts of the instruments and basic notations.

### COURSE MD311 - Practical: Stage Performance and Viva

- Gain skills in the fingering techniques and sitting posture and holding the instrument.
- Able to play the various Talas and different tempos applicable in different exercises.
- To become skillful player by learning advanced technical terminologies used in practicals.
- To develop the knowledge of unique contributions of Mridangam stalwarts.

### COURSE VV312 – Theory: Technical Terminology and Raga Lakshanas

- Gain the knowledge of technical terminologies of the instrument opted for.
- Understand the characteristic features of ragas prescribed.
- Knowledge of basic notations and different parts of the instrument.
- Develop the knowledge for tuning for the opted instrument.

### COURSE VV313 - Practical: Stage Performance and Viva

- Students will able to hold opted instrument and its functions.
- Students will demonstrate the different speeds through playing instrument.
- Study elementary technical term.
- Learn how to play different speeds.

### COURSE TD404 – Theory: Theory of Thumri-Dadra

- Students learn the brief history of harmonium, Sarangi & Tabla.
- Students learn to write the notation of Thumri-Dadra.
- Students learn to description of prescribed Ragas.

- Students learn to write notation of various talas with layakaris.
- Students learn the basic tuning of Tabla and Sarangi.

### COURSE TD405 - Practical: Stage Performance and Viva

- Students are introduced to various instruments which are used to accompanying the Thumri & Dadra recital.
- Students get to know and are being able to demonstrate the silent features of Thumri & Dadra singing.
- Student learn the description of various prescribed Ragas.
- Student learn and are able to demonstrate one Thumri and one Dadra in two different Ragas.
- Students are taught and are able to demonstrate the prescribed talas by hand-beats.
- Students learn to tune the Tanpura.
- Students demonstrate in exam in not less than 20 minutes.

### COURSE HA406 – Theory: General Theory of Harmonium and Indian Music

- Students learn to write alankaras with respective finger techniques.
- Students learn to write the notation of composition.
- Students get to know the description of prescribed Ragas.
- Students learn to write the notation of Talas with different layakaries.
- Students learn about the life and contribution of renowned harmonium players of the country.

### COURSE HA407 - Practical: Stage Performance and Viva

- Various finger techniques in Harmonium playing.
- Students develop the ability to demonstrate various alankaras practically using finger techniques.
- Students learn different Ragas & Talas.
- Gradually, the students develop the ability to play fast compositions in various ragas with elaborations.
- Students learn to play Dhuns in prescribed ragas.

### COURSE TB408 – Theory: Notation Writing Skill

- Knowledge of structural details of Tabla and its various parts.
- Students get the ability to write notation of the Theka of various tala.
- Ability to write notation of advance composition in Teentaal and Chautala.
- Students get the ability to write notation of different layakaries of Dadra and Keherwa talas.
- Knowledge about Rupak/TevraTaal.

### COURSE TB409 - Practical: Stage Performance and Viva

- Ability to play the Theka of Jhaptaal/ Dhamar with different layakaries.
- Ability to demonstrate the advance compositions in Teentaal/ Chautaal.

- Ability to play Ektaal/Chautal and Roopak/Tevra talas.
- Ability to play a simple Kayada/Rela in Jhaptaal/Dhamar talas.
- Students get to learn variations in Keherwa and Dadra Tala practically.

### COURSE MD410 – Theory: Contributions of Popular Mridangam Stalwarts and Notation System

- The course will develop the ability to define the technical terminology used in practical lesson such as Chappu , Meetu, Toppi, Varu and Choru.
- Understand the practical lessons like Mohra, Pharan and Korvai.
- Gain skills in tuning the instrument mridangam and understand the basic notations
- Understand the contributions of prominent mridangam stalwarts towards the instrument playing.

### COURSE MD411 - Practical: Stage Performance and Viva

- The course will develop the ability to practical lesson such as Chappu , Meetu, Toppi, Varu and Choru.
- Understand the practical lessons like Mohra, Pharan and Korvai.
- Gain skills in tuning the instrument mridangam and understand the basic notations.
- Understand the contributions of prominent mridangam stalwarts towards the instrument playing.

### COURSE VV412 – Theory: Musical Forms and Biographies

- Ability to know the fingering/bowing techniques of the instrument.
- Able to play various speeds.
- Gain skills about the tuning of Veena/Violin.
- Study various speeds and tuning techniques.

### COURSE VV413 - Practical: Stage Performance and Viva

- Able to play the compositions of various composers‟ in different talas.
- Gain skills about tuning the instrument Veena/Violin and understand the basic notation system.
- Know the important contributions of Veena and Violin composers.
- Able to develop the knowledge for tuning for the opted instrument.

## 7. B.A (H) KARNATAK MUSIC

### 7.1 Core Courses

### COURSE 101 - Theory: General Musicology

- Develop the ability to define some musical concepts, describe the characteristic features of ragas.

- Gain knowledge about the rudiments of Western Classical Music and contributions of prominent composers of Karnatak music.
- Understanding of the classification of musical instruments, constructions and its playing techniques.
- The holistic approach in tutoring makes them motivated and proficient in both practice as well as theory of Karnatak Music.

### COURSE 102 - Practical: Stage Performance and Viva

- Students will develop the ability to perform simple varnams in two degrees of speed
- They will learn compositions of Prominent composers in the prescribed ragas.
- They will be focused on the principles of performance.
- The main focus of the course is to develop an aptitude towards the classical subject opted and inculcate the abilities to maintain the classicism in the art along with well approved principles.

### COURSE 201 – Theory: Theory of Indian Music

- Ability to define the terms like embellishments, scales, talas etc and explain other musical concepts.
- Understanding of Western Music Terminologies and biographies of selected prominent Pre and Post Trinity composers.
- Ability to write notation of musical form -Varnam in two degrees of speed.
- The main focus of the unit is to imbibe the tangible concepts of Indian and western classical music and technical aspects of music like scale system and rhythmic system along with the Indian notation system.

### COURSE 202 - Practical: Stage Performance and Viva

- Ability to demonstrate Varnam in two degrees of speed.
- Learn compositions of prominent composers in the prescribed ragas.
- The main focus of the course is to develop an aptitude towards the classical subject opted.
- It inculcates the abilities to maintain the classicism in the art along with well approved principles.

### COURSE 301 – Theory: Indian Musicology

- Gaining knowledge of Technical Terms of Ancient Indian Music, Classification of Ragas of different periods, Patronage of Music before the independent era.
- Accumulative knowledge of pre- post Trinity and modern composers.
- The main focus of this unit is to create an in depth knowledge about the everlasting history of Indian Music, its technical terms, old texts and biographies.
- It also deals with notation of the compositions and imbibe the basic concepts of Indian notation system.

### COURSE 302 - Practical: Stage Performance and Viva

- Ability to demonstrate various musical forms.

- Creative aspects of ragas from the prescribed syllabus.
- The main focus of this course is to develop an aptitude towards the practical ability in singing the compositions of the prominent composers of Karnatak Music.
- Develop an understanding about the concert pattern of it.

### COURSE 303 – Viva-Voce

- Ability to improvise and demonstrate characteristic features of ragas through various musical forms.
- This course aims at practically elaborate and illustrate the compositions.
- Orally demonstrate the creativity and know-how of the ragas.
- Learn the details about the compositions.

### COURSE 401 – Theory: Indian Music

- Knowledge of various concepts and terminologies prevalent in ancient Music of India.
- Awareness about the status and popularity of Karnatak Music in the society.
- Learning about the Life and Contributions of Great Composers of yester years and modern period.
- It also deals with notation of the compositions and imbibes the basic concepts of Indian notation system.

### COURSE 402 - Practical: Stage Performance and Viva

- Ability to demonstrate complex musical forms by prominent composers.
- Demonstrate the melodic and rhythmic expressions in the creative aspects of prescribed ragas.
- The main focus of this course is to develop an aptitude towards the practical ability in singing the compositions of the prominent composers of Karnatak Music.
- Develop an understanding about the concert pattern of it.

### COURSE 403 – Practical: Viva-Voce

- Ability to demonstrate the knowledge of ragas, through advanced musical forms and creative aspects.
- This course aims at practically elaborate and illustrate the compositions mentioned in the syllabus.
- Orally demonstrate the creativity and know-how of the ragas.
- Learn the details about the compositions.

### COURSE 501 – Theory: Indian Music

- Ability to apply the subject knowledge and build up the practical aspects.
- Gain knowledge of the characteristic features of prescribed ragas and
- Life and Contributions of composers of different streams of classical music.
- Develop the knowledge of construction and playing technique of Percussion Instruments.

### COURSE 502 - Practical: Stage Performance and Viva

- Ability to demonstrate the practical nuances inherent in compositions of prominent composers.
- Developing the competency at the performance level.
- The main focus of this course is to develop an aptitude towards the practical ability in singing the compositions of the prominent composers of Karnatak Music.
- Develop an understanding about the concert pattern of it.

### COURSE 601 – Theory: Study of Hindustani Music

- Understanding the important concepts, musical instruments.
- Learn from prominent composers of Hindustani music.
- The main focus of this unit is to create an in-depth knowledge about the basic principles of Hindustani music its technical terms, old texts and biographies.
- It also deals with notation of the compositions and imbibes the basic concepts of Indian notation system.

### COURSE 602 - Practical: Stage Performance and Viva

- Ability to demonstrate the practical nuances inherent in compositions of prominent composers.
- Developing the competency at the performance level.
- The main focus of this course is to develop an aptitude towards the practical ability in singing the compositions of the prominent composers of Karnatak Music.
- Develop an understanding about the concert pattern of it.

## 8. B.A (H) SANSKRIT

### 8.1 Compulsory Language

### MIL-A1 – Sanskrit Literature

- The students will learn the advance form of Sanskrit language as one of the modern Indian Language through the practice of simple Sanskrit writings.
- The stories and verses prescribed in the course will help the learners develop an understanding of the moral and ethical values that will be useful in their day-to-day life situations.
- They will be familiar with the rich history of Sanskrit Literature. This course will enhance their skills of chaste Sanskrit pronunciation as well as competence and performance of the language.
- This will help them translate and explain the prescribed Sanskrit texts in their native language.

### MIL-B1 – Upanishad and Bhagawad Gita

- Students will be able to peep into understand the spiritual depth of the intellectual wisdom of Indian seers.

- The Ishopanishad teaches the art of harmonising materialism and spiritualism.
- The subject matter of the Bhagawad Gita II comprising of the concepts of Niṣkām karmyoga, Self and Sthita Prajña (the ideal human being) will enable learners to attain a proper balance between intellectual and emotional faculties.
- After the completion of this paper the students will be aware of the solutions of many modern-day conflicts available in the upanishadic literature and Bhagavad Geeta.
- They will get to know the spiritual aspects of Indian traditions separated from the religious tradition.

### MIL-C1 – Niti Literature

- The students will learn the essence of the ways of life depicted and enjoined in the Niti Literature of Sanskrit language.
- They will also learn various aspects and forms of Sanskrit as one of the modern Indian Languages through the practice of easy and simple Sanskrit texts of Niti Literature.
- The storylines and the study and verses from the prescribed texts will instill in the students the moral and ethical values that will be an asset in the lived lives. They will be familiar with the general history of Sanskrit Literature and with the style and contents of the works of eminent literary figures like Bhasa, Kalidas, Bhavabhuti and Banabhatta etc.
- This course will enhance the skill of chaste Sanskrit pronunciation as well as competence and performance of language. This will help them translate, explain the prescribed Sanskrit texts in their native language.

## 8.2 Core Courses

### C-1 – Classical Sanskrit Literature (Poetry)

- This course will help the students develop a fair idea of the works of great Sanskrit poets.
- They will be able to appreciate the styles and thoughts of individual poets focusing on the poetical, artistic, cultural and historical aspects of their works.
- This course will enhance competence in chaste classical Sanskrit.
- It will give them skills in translation and interpretation of poetic works.

### C-2 – Critical Survey of Sanskrit Literature

- This course will help the students develop a fair idea of the works of great Sanskrit seers.
- They will be able to improve their knowledge about philosophy, socio-religious life, polity as depicted in the prescribed areas of study.
- This course will also introduce them to three important śāstras.
- This course aims to get students acquainted with the journey of the Ārsha literature from the Vedas to the Purāṇas.

### C-3 - Classical Sanskrit Literature (Prose)

- The course will enable students to familiarize themselves with some leading classical prose works and the individual literary styles of their authors.
- After the completion of this course the learner will be exposed to the socio-cultural conditions of the Indian society as reflected in the prescribed texts.
- They will acquire skills in advanced Sanskrit communication.
- The course also seeks to help students negotiate texts independently.

### C-4 – Self Management in the Gita

- This course will help students to learn to read the Gītā as a multipolar text which is open to several alternative interpretations.
- This course will equip them with the practical skills to negotiate conflicts and emotional disturbances and define and pursue their goals with clarity and dedication.
- The course will instill leadership qualities in learners.
- It will also help them to grow as balanced and successful human beings who can face the challenges of life successfully.

### C-5 - Classical Sanskrit Literature (Drama)

- After completion of this course the students will be aware about the beauty and richness of classical Sanskrit dramatic tradition.
- This course will enhance the ability for critical thinking on issues of culture, polity, morality, religion etc as reflected in the prescribed texts.
- The course will make the students aware of the formal structures of Sanskrit drama in the tradition of Bharata's natya Shastra.
- This course is intended to acquaint the students with three of the most famous dramatic works of Sanskrit literature which represent the three stages of the development of Sanskrit drama.

### C-6 – Poetics and Literary Criticism

- This course will make students aware of with the skills to assess the merits or demerits of works on poetry, prose and drama.
- They will be able recognize the various genres of poetry, appreciate the objectives of poetry.
- It analyses the structure of a work in terms of the essential ingredients of poetry as propounded.
- Students will be inspired and encouraged to compose.

### C-7 – Indian Social Institutions and Polity

- After the completion of this course students will be able to connect the theoretical model propounded by the prescribed texts in the forms of saptanga theory, shadguna theories and mandala theories with contemporary governance issues.
- The learners will be able to see Dharma as dynamic institution.
- This will free them from the traces of fundamentalism and they should become more open minded and liberal.

- Learning and developing a critical approach about the institution of caste and women's issues will make the participants sensitive to discriminating practices.

### C-8 – Indian Epigraphy, Paleography and Chronology

- This course will equip students with the necessary tools for the study of Indian inscriptions.
- They will learn ancient scripts and use their knowledge in studying more inscriptions later.
- Students will be able to read, collate and interpret inscriptions to reconstruct history.
- Thus, it will be useful for students who are interested in pursuing advance study in archaeology.

### C-9 – Modern Sanskrit Literature

- This course will enable the students to appreciate the Mahākāvya and Charitakāvya, Gadyakāvya , Rūpaka, GītiKāvya and Other genres and General Survey of Modern Sanskrit Literature.
- It will create an awareness of the modern historicity of the modern Sanskrit literature.
- The purpose of this course is to expose students to the rich & profoundly active tradition of modern creative writing in Sanskrit, enriched by new genres of writing.
- They will have the ability to develop a research project/assignment including formulation of a research problem, searching for sources and engaging in analytic discussion.

### C-10 – Sanskrit World Literature

- Scholars who pursue this course will learn about the cultural contacts between India on the one hand and Europe, West Asia and South East Asia on the other during different phases of history.
- They will also see how colonialism distorted India's achievements in knowledge production.
- They will become aware of Indo European linguistic and cultural affinities, spread of Indian fables, the Upanishads, the Gita and Kalidasa's works in the west.
- They will be able to appreciate the close relation between Upanishadic thought and Sufism.
- They will study how Sanskrit literature has impacted India's cultural ties with South East Asian countries.

### C-11 – Vedic Literature

- By reading these texts, students will have an impression of the depth of Vedic knowledge and will be able to realize that ideas of Vedic seers are based on philosophical, moral, and scientific principles.
- By understanding them, students will be able to know and achieve some higher attributes from Vedic heritage about our culture, morals, and thoughts. Thus, they may develop curiosity to know more about other Vedic texts and concepts as well.

- After completing this course students will surely be able to communicate about some important Vedic verses with their meaning and teaching, and thus fundamentals of religious life of India will be revealed to them in its true form.
- Students will understand the strength of Unity, power of mind, and will realize the importance of earth in their life. From the study of Upaniṣad they will know about philosophical and psychological insights of our ancestors and can develop this learning further for the benefit of themselves in particular and society in general.

### C-12 – Sanskrit Grammar

- After completion of this course students will understand the basic structural nuances of Panini's grammar.
- They will become familiar with fundamental samdhi and compounding patterns.
- They will also understand some most important primary and secondary suffixes of Sanskrit.
- The practice of the application of the rules learnt from the reading of the texts will further enhance their knowledge of the structural patterns of Sanskrit language.

### C-13 – Indian Ontology and Epistemology

- Students will become familiar with primary and one of the most important and influential school of Indian Philosophy i.e. Nyaya-Vaisesika through its basic text the Tarkasangraha.
- They will also be introduced to essential problems in philosophy - Causation, Ontology and Epistemology.
- This will enable them to engage with other texts in Indian philosophy with some ease.
- It also intends to give them an understanding of essential aspects of Indian Philosophy like Realism, Idealism, Monism, Dualism etc.

### C-14 – Sanskrit Composition and Communication

- This course will help the learners develop a critical, linguistic and scientific approach towards Sanskrit language.
- The practice of essay writing will make the students form ideas and express them in Sanskrit.
- This practice will also familiarise them with various shastric theories.
- Students will learn also learn the art of translation from Sanskrit into Hindi and vice versa.

## 8.3 Discipline Specific Elective Courses

### DSE-1 – Indian System of Logic and Debate

- This course will provide knowledge of the principles of debate according to the Nyaya School.
- It will develop logical faculty of their minds and help them to perceive the world in a more rational way.

- They will develop the skill to present their arguments in a more structured manner and to see through fallacious arguments given by others.
- This course aims to get the students acquainted with the Indian principles of debate and its applications, not just in philosophical dialogue, but in every sphere of knowledge.

### DSE-2 – Art of Balanced Living

- Graduates who read this course will acquire the necessary tools for a balanced life. They will know the true essence of listening (acquisition of information) manana (reflection) and nididhyasana (unflinching commitment). In this segment students can learn how to improve concentration.
- . They will be able to identify the causes for indecisiveness and confusion and will learn how emotional stability can lead to clearer thinking.
- This section will help students to understand the importance of Ashtang yoga and Kriyayoga for the purification of mind.
- Team work and social cohesion require inter personal skills. Here students will know how to improve their behaviour through jnana, dhyan, karma and bhakti yoga.
- Students will also understand how active engagement with action is most conducive to healthy and successful living.

### DSE-3 – Theatre and Dramaturgy in Sanskrit

- After going through this course students will be able to know about several theoretical aspects of theatrical performance and production.
- They will become aware of the many types of theatres, their design and construction and stage setting for various kinds of dramas in ancient India.
- Students will also become familiar with the main principle of theatre performance and appreciation.
- Students will also become familiar with the main principle of theatre performance and appreciation.

### DSE-4 – Sanskrit and Other Modern Indian Languages

- With this course, students will be able to analyse languages in their different aspects- phonetic, semantic, syntactic and morphological.
- On these structural levels they will be able to examine the interconnection of Sanskrit with other Indic languages and appreciate the linguistic unity of India and shed their linguistics chauvinism and see how all Indian languages are connected and related.
- They will become aware of the evolution of Indian languages from Sanskritic languages.
- They will also see Sanskrit literature as a source and instrument of enrichment of medieval and modern Indian literary traditions.
- It would also show the cultural and literary continuity of India.

### DSE-5 – Sanskrit Linguistics

- Students will develop a scientific approach to the study of languages.

- They will become aware of the linguistic structure of Sanskrit and see its close relation with the Avestan and Prakrits.
- This course aims to provide knowledge about the linguistic features of Sanskrit.
- It exposes them to close affinity with the Avestan and the Prakrits.

### DSE-6 – Computational Linguistics for Sanskrit

- Learn the basic concept of Theoretical Concepts of Computational Linguistics.
- Learn the basic concept various Applied Areas of Computational Linguistics e.g. Morphological Analyzer/Speech/Speaker Recognition, Speech Synthesis, Text to Speech, Language Analysis, Understanding, Generation, Natural Language Interface, Text Processing and Machine Translation etc.
- Learn the basic concept of databases for data Storage.
- Student also learn the Survey of Computational Linguistics.

### DSE-7 – Fundamentals of Ayurveda

- Graduates who read this course should be able to know the ancient tradition of Indian Medicine system, which has focused not only to the physical health but a healthy lifestyle.
- After reading this paper students will know the history of Āyurveda through original sources of ancient medicine system enshrined in Sanskrit texts.
- It will develop their understanding of Health and Disease as explained in Āyurveda, and the way of diagnosing the illness.
- By reading this portion of Upaniṣad, student would develop a more balanced approach towards life.

### DSE-8 – Environmental Awareness in Sanskrit Literature

- After completing this course, students will realize that they are a part of nature and nature belongs to all creatures.
- they should be more careful about the utilization and preservation of natural resources.
- This will make them better citizens of the world.
- The main objective of this course is to make the students acquainted with the basic concept of Indian Environmental Science and salient features of environmental awareness as reflected in Vedic and Classical Sanskrit literature.

## 8.4 Generic Elective Courses

### GE-1 – Basic Sanskrit

- Students will acquire basic knowledge of the Sanskrit language.
- They will be able to communicate in simple Sanskrit.
- They will develop an interest in Sanskrit and the Bhagwadgita.
- They will be motivated to study further.

## GE-2 – Indian Culture and Social Issues

- Basic understanding of culture and civilization at large dimensions, on the basis of which they will be able to evaluate Indian culture in modern terminologies.
- Evolution of Indian culture through different ages from ancient times to the modern age with the symbiosis of alien elements.
- Highlighting the undercurrent of Sanskrit-led culture in vernacular as well as urban shades of cultural life.
- inculcate among the students the capability of debating and ways of arousing valid questions within and to the tradition and find out the efficient answer to cope up with the modern problems.

## GE-3 – Tools and Techniques for Computing Sanskrit Language

- Learn the basic concept of Sanskrit Phonology, Sanskrit Morphology, Syntax, Semantics, Lexicon and Corpora.
- Learn the origin and Development of Language Computing.
- Basic Introduction of Computing Sanskrit Language.
- Various methodologies used on Language Technology.
- Various tools developed for Sanskrit Language.
- Survey of Language Computing
- Evaluation and Challenges in Machine Translation

## GE-4 – Basic Principles of Indian Medicine System

- Graduates who read this course should be able to know the ancient tradition of Indian Medicine system, which has focused not only to the physical health but a healthy lifestyle.
- Students will know the history of Āyurveda through original sources of ancient medicine system enshrined in Sanskrit text.
- Students will be able to understand seasonal regimen & social conduct and its effect on health.
- Students will get equipped with the knowledge of some extremely important plants which are available in their surroundings.

## G-5 – Indian Aesthetics

- This course will enable students to identify the real essence of Beauty propounded by Indian rhetoricians.
- After the completion of the course the learner will come across the Indian deliberation on aesthetic experience in the form of Rasa and its process.
- The participant will be able to appreciate the various artistic mods of expressions of Beauty in general and poetry in particular.
- The course will help the student peep into the historical evolution of the Indian science of aesthetics.

## GE-6 – Fundamentals of Indian Philosophy

- Indian Philosophy teaches critical thinking, close reading, clear writing, and logical analysis. It develops the tools of logic and reason to analyze the ways in which the individual experiences the Universe.
- It guides the student to understand the language we use to describe the world, and our place within it. Different areas of philosophy are distinguished by the questions they ask.
- The most important reason to study philosophy is that it is of enormous and enduring interest.
- Philosophy is important, but it is also enormously enjoyable in which students are provided with the tools and the opportunity to develop and express their own philosophical views.

## GE-7 – Ancient Indian Polity

- It should be a great opportunity for these students to understand the nature of ancient Indian polity from original Sanskrit sources from Vedic texts to Dharma shastra and Niti texts.
- Students will be able to learn how the state is an organic entity and how optimum functioning of each organ is necessary for the smooth functioning of the whole.
- Students are expected to appreciate the well-designed administrative structure of ancient India. They should be able compare ancient and contemporary models.
- Students will be able to understand various aspects of ancient law, justice, taxation and diplomacy.
- The shadguna and mandala theories provide a practical and pragmatic understanding of foreign relations and tell how international diplomacy is to be conducted.

## GE-8 - Indian Epigraphy and Paleography

- Contents of this course are related to formation of history of ancient India, so it is an interdisciplinary course within Sanskrit.
- Students of Sanskrit can understand how important role Sanskrit based inscriptions play in preparing history.
- Knowledge of the language can help historians to make a perfect history.
- Similarly, students of History will find themselves on the positive ground and direct in touch with material related to history of ancient India.

## GE-9 – Computer Applications for Sanskrit

- Learn the basic Interactive Sanskrit Teaching Learning Tools.
- Learn the Basics of Multimedia, Web based tools development.
- Working knowledge of HTML and web page development.
- Working with Unicode Typing in Devanagari Scripts.
- Learn the Various Typing Tools and Software for Devanagari Unicode.
- Learn the Text preservation techniques and web publishing.
- Student also learn the Optical Character Reader (OCR), Applications of OCR for Sanskrit and Indian Languages, Tool and Techniques, Survey of the OCR.

### GE-10 – Individual, Family and Community in Indian Social Thought

- Students will learn about important ethical and philosophical issues concerning relations between the individual and society.
- They will learn about the metaphysical background in which ethical solutions are offered.
- It will also expose them to controversial social issues and allow them to develop the sensitivity required to handle social tensions.
- This course will also help learners to develop a positive approach towards nature.

### GE-11 – Nationalism and Indian Literature

- After completing this course, students will realize about the importance of Nation in their upbringing.
- They will have admiration for their Nation and will like to know more and more about the National heritage.
- Socio-Religious Nationalist thoughts of our seers, freedom fighters, and modern thinkers will give them wider vision to understand Nationalism.
- The study of important and famous poems of Sanskrit, Hindi, and Urdu poets will create new interest and social harmony in students.

### GE-12 – Indian Architectural System

- This section deals with the fundamental principles of the science of Architecture (Vastushastra).
- The students will become aware of the synchronization of five elements (Mahabhutas) in constructions.
- It also intends to give an elementary understanding of Vastuvidya.
- It enables students to learn the town planning and construction of residential houses in Sanskrit texts on Vastu.

## 8.5 Skill Enhancement Courses

### AEEC-1 – Acting and Script Writing

- After studying this course, the students will be able to know about the performance aspect of the arts in Indian context.
- They will learn the skills of developing a story or an incident into writing of the script of the play.
- Students will also be inspired and encouraged to prepare the scripts as well as perform it on the stage.
- This paper deals with the rules of performance of play (acting) and dramatic composition (script writing) and aims at sharpening the dramatic talent of the students.

## AEEC-2 – Reading Skills in Brahmi Scripts

- This course is helpful for students to investigate how actually Brahmi script developed and transformed into a wide variety at a time when mode and means of transport and communication were extremely slow.
- After acquiring knowledge of its variation, it will certainly be helpful in ascertaining to understand period of an inscription whose date is uncertain.
- This course is highly helpful for the students willing to adopt archaeology as their occupation with a background of Sanskrit.
- Students will acquaint with earlier examples of variations in the Brahmi script which developed into modern Indian scripts.

## AEEC-3 – Machine Translation: Tools and Techniques

- Learn the origin and Development of Machine Translation.
- Basic Introduction of Machine Translation.
- Human vs Machine Translation.
- Concepts to ideal various methodologies used on Machine Translation System.
- Using guidelines of the Machine Translation system: Google and Bing.
- valuation and Challenges in Machine Translation.

## AEEC-4 – Evolution of Indian Scripts

- Students willing to engage in archaeology can be enlightened about the importance and background of written material and utilize it in future.
- Study of scripts are useful to evaluate and understand believes of prevailing contemporary multiple contents.
- After undergoing this course, students will be able utilize relevant information to develop capability to fix a date of an unknown writing, incidents, etc., with co-relating it to the available similar writing, and somewhat continuing incidents.
- Thus, it becomes helpful and useful for the students who are interested in pursuing advance study in archaeology.

## AEEC-5 – Sanskrit Meter and Music

- After studying this course, the students will be able to understand the origin and development of Indian Prosody and various conceptual elements of Sanskrit classical meters.
- They will be able to apply their knowledge in other Sanskrit courses like classical Sanskrit drama and poetry as well as identify the meters used by various poets in their poetry works.
- They will be able to appreciate their lyrics while reciting them and will be inspired to translate their emotions and feelings in to metrical Sanskrit writings.
- To inculcate capability enhancement in the students to co-relate with other texts in their course and to write meters of their own.

## 9. B.A (PROGRAMME) ENGLISH

### 9.1 Compulsory Language

#### A. English Language through Literature

- Develop in students the ability and confidence to process understand and examine different kinds of texts - verbal and written - that they encounter in everyday life.
- Encourage suitable research; to recognize sources; to distinguish fact from opinion/editorialization; produce objective versus subjective pieces.
- Teach skilled comprehension; listening/reading; skimming; summarising; précis writing; paraphrasing; note making.
- Help students identify and use the characteristic features of various writing forms: letters programmes reports/press-releases; newspaper hard news; feature articles; fiction and nonfiction.
- Inculcate confident expression: to enable students to articulate their own views confidently because their language skills sufficiently empower them to converse research and collate information from various textual sources be this verbal or written.

#### B. English Fluency

- Describe or express their opinions on topics of personal interest such as their experiences of events, their hopes and ambitions.
- Read and understand information on topical matters and explain the advantages and disadvantages of a situation.
- Write formal letters, personal notes, blogs, reports, and texts on familiar matters.
- Comprehend and analyse texts in English.
- Organise and write paragraphs and a short essay in a variety of rhetorical styles.

#### C. English Proficiency

- Enhance comprehension skills and enrich vocabulary through the reading of short and simple passages with suitable tasks built around these.
- Introduce simple syntactical structures and basic grammar to students through contextualized settings and ample practice exercises so that they can engage in short independent compositions.
- Introduce the sounds of the language and the essentials of English pronunciation to students in order to remove the inhibitions experienced by them while speaking English.
- Acquaint students with social formulae used to perform various everyday functions so that they can converse in English in simple situations.

#### AECC English

- Students will master the art of persuasive speech and writing.
- Students will master the art of listening, reading, and analysing.
- Students will spend the bulk of their time in class in practical exercises of reading and writing.
- Students will develop critical thinking skills.

- They will be introduced to established principles of academic reading and writing

## 9.2 Discipline Specific Core Courses

### DSC 1A – Selections from Individual and Society

- The course offers the BA Programme student an opportunity to study three years of English Discipline papers that enable them to go for further studies in English if they so desire.
- The course attributes to the students a working knowledge of how to read literary texts.
- The course introduces students to contemporary literary ideas and issues in an increasingly complex world.
- The course allows the student a familiarity with literary texts through different genres and time periods.

### DSC 1B – Selections from Modern Indian Literature

- The course attributes to the students a working knowledge of how to read literary texts.
- It enables them to use such knowledge to enhance and augment their professional job opportunities.
- They will be introduced to established principles of academic reading and writing.
- The course allows the student a familiarity with literary texts through different genres and time periods.

### DSC 1C – British Literature: Poetry and a Play

- Students will spend the bulk of their time in class in practical exercises of reading and writing.
- Students will develop critical thinking skills.
- The course introduces students to contemporary literary ideas and issues in an increasingly complex world.
- Students will master the art of persuasive speech and writing.

### DSC 1D – Literary Crosscurrents: Selections from Living Literatures

- Students will master the art of listening, reading, and analysing.
- The course allows the student a familiarity with literary texts through different genres and time periods.
- The course offers the BA Programme student an opportunity to study three years of English Discipline papers that enable them to go for further studies in English if they so desire.
- The course attributes to the students a working knowledge of how to read literary texts.

### DSC 1E – Detective Literature/Modern Day Drama

- Enable students to write in expository argumentative and descriptive modes
- Enable students to choose between expository argumentative descriptive and narrative writing styles to assemble their own writing

- Encourage suitable research; to recognize sources; to distinguish fact from opinion/editorialization; produce objective versus subjective pieces.
- Teach skilled comprehension; listening/reading; skimming; summarising; précis writing; paraphrasing; note making.

### DSC 1F – Children's Literature/World Literatures

- Identify key topics/arguments/ideas.
- Help students identify and use the characteristic features of various writing forms: letters programmes reports/press-releases; newspaper hard news; feature articles; fiction and nonfiction.
- Inculcate confident expression: to enable students to articulate their own views confidently because their language skills sufficiently empower them to converse research and collate information from various textual sources be this verbal or written.
- Students will develop critical thinking skills.

## 10. B.A (PROGRAMME) SANSKRIT

### 10.1 Compulsory Language

### MIL-A1 – Sanskrit Literature

- This course aims are to get the students acquainted with the outline of Sanskrit Prose and Niti literature.
- Origin and development of prose, important prose romances and Sanskrit fables are also included here for students to get acquainted with the beginnings of Sanskrit Prose Literature.
- The course also seeks to help students negotiate texts independently.
- After the completion of this course the learner will be exposed to the origin and development of the Sanskrit Prose and Niti Literature.

### MIL-B1 – Upanisad and Geeta

- Objective of this course is to get students to know about the principle thesis of the Upaniṣad and the Gītā.
- The course will enable students to familiarize themselves with Īśāvāsyopniṣad some portion of 2nd Chapter of Gita.
- They will also be introduced to Upaniṣad philosophy.
- After the completion of this course the learner will be exposed to the Philosophy of Gita and Upaniṣad.

### MIL-C1 – Niti Literature

- The students will learn the essence of the ways of life depicted and enjoined in the Niti Literature of Sanskrit language.

- They will also learn various aspects and forms of the storylines and the study and verses from the prescribed texts will in-still in the students the moral and ethical values that will be an asset in the lived lives.
- They will be familiar with the general history of Sanskrit Niti Literature.
- This course aims are to get the students acquainted with the outline of Sanskrit Nīti literature through texts Pañcatantram and Nītiśatakam with the General Introduction to Sanskrit Literature.

## 10.2 Discipline Specific Core Courses

### DSC-1 – Sanskrit Poetry

- This course will help the students develop a fair idea of the works of great Sanskrit poets.
- They will be able to appreciate the styles and thoughts of individual poets focusing on the poetical, artistic, cultural and historical aspects of their works.
- This course will enhance competence in chaste classical Sanskrit.
- It will give them skills in translation and interpretation of poetic works.

### DSC-2 – Sanskrit Prose

- The course will enable students to familiarize themselves with some leading classical prose works and the individual literary styles of their authors
- After the completion of this course the learner will be exposed to the socio-cultural conditions of the Indian society as reflected in the prescribed texts.
- They will acquire skills in advanced Sanskrit communication.
- The course also seeks to help students negotiate texts independently.

### DSC-3 – Sanskrit Drama

- After completion of this course the students will be aware about the beauty and richness of classical Sanskrit dramatic tradition.
- This course will enhance the ability for critical thinking on issues of culture, polity, morality, religion etc as reflected in the prescribed texts.
- The course will make the students aware of the formal structures of Sanskrit drama in the tradition of Bharata's natya Shastra.
- This course is intended to acquaint the students with three of the most famous dramatic works of Sanskrit literature which represent the three stages of the development of Sanskrit drama.

### DSC-4 – Sanskrit Grammar

- After completion of this course students will understand the basic structural nuances of Panini's grammar.
- They will become familiar with fundamental samdhi and compounding patterns.
- They will also understand some most important primary and secondary suffixes of Sanskrit.
- The practice of the application of the rules learnt from the reading of the texts will further enhance their knowledge of the structural patterns of Sanskrit language.

## 10.3 Discipline Specific Elective Courses

### DSE-1 – Philosophy, Religion and Culture in Sanskrit Tradition

- Objective of this course to introduce Philosophy, Religion and Culture in Sanskrit Tradition to the students.
- The students will learn the essence of the Philosophy, religion and cultural traditions of ancient India which depicted Sanskrit Literature.
- They will also learn various aspects of the Dharma and actions.
- They will also learn about the importance of Sanskara, theory of Purushartha from ancient texts.

### DSE-2 – Indian Perspectives in Personality Development

- Indian philosophical tradition advocates an integrated approach to human personality where material and psychological growth complement each other.
- This course seeks to introduce some theoretical concepts and practical techniques for development of the human person.
- The course will enable to students to know the concept of a person, personality and major for behaviour improvement based on Gita and Upanisad.
- The course will help the learner how to develop the personality on the whole as a human being in perfect manner.

### DSE-3 – Literary Criticism

- This course will enable the students to know basics of literary criticism.
- It aims at essential resources, definition and the principal types of poetry on the basis of Mammat's Kāvyaprakāśa.
- After the completion of this course the learner will be exposed to the power/function of word- Abhidha Lakshana.
- After the completion of this course the learner will be exposed to the power/function of meaning - yanjana.

### DSE-4 – Nationalism in Sanskrit Literature

- This course will enable the students to know about the concepts and besic features of Indian Nationalism i.e. Meaning, Definitions and Elements of Indian Nation 'Rāṣṭra', Indian nationality, National symbols etc. and make realize about the importance of Nation in their upbringing.
- They will have admiration for the nation and like to know more and more about the National Ethos.
- After the completion of this course, the learner will be exposed to the contribution of Sanskrit Literature to nationalistic thoughts in wider perspective.
- This course will make the student acquenting with the broad spectrum of indian nationalism trends as depicted in the ancient classical and modern Sanskrit literature.

### DSE-5 – Mathematical Tradition in Sanskrit

- The objective of this course is to introduce the Indian mathematical tradition to the students throughout ancient Sanskrit texts.
- This course will enable the students to appreciate the basic concepts of theories of ancient Indian mathematics.
- This course will make the learner capable to understand.
- Analysing the Līlavatī, Āryabhaṭṭīyam with the brief history of mathematics in Sanskrit.

## 10.4 Generic Elective Courses

### GE-1 – Political Thought in Sanskrit

- This course will enable the students to appreciate the fundamental concepts of indina political thoughts discussed in ancient Sanskrit texts such as Vedic Samhitas, Mahābhārata, Purāṇas, Kauṭilya's Arthaśāstra and other works known as Nītiśāstra.
- It is supposed to create an awareness of the various aspects of Indian political thoughts and institutions of polity.
- Make the people politically conscious from time to time.
- The aim of this course is to make the students acquainted with various aspects of Indian Political Thought and institutions of Polity.

### GE-2 – Sanskrit Media

- This course will enable the students to appreciate the Sanskrit media, including both electronic and print media.
- This course will make the learner capable of analysing the print media particularly magazines and newspapers based on various aspects i.e. article collection, editing and reporting.
- It also creates an awareness about Sanskrit and social media via internet, blogs writing and Sanskrit Wikipedia.
- Students will get the brief information regarding Sanskrit Media.

### GE-3 – Sanskrit Meter and Music

- This course will enable the students to appreciate the basic knowledge about Chandaśāstra.
- The course will make the learner capable of analysing classification and elements of Sanskrit meter including vedic and classical meter with their lyrical methods.
- It is supposed to create an awareness of the classical meter and their musical rendering.
- This develops capacity for creative writing and literary appreciation along with the Musical Rendering.

### GE-4 – Nationalistic Thought in Sanskrit Literature

- This course will enable the students to know about the concepts and basic features of Indian Nationalism i.e. Meaning, Definitions and Elements of Indian Nation ‘Rāṣṭra’,

Indian nationality, National symbols etc. and make realize about the importance of Nation in their upbringing.

- They will have admiration for the nation and like to know more and more about the National Ethos.
- After the completion of this course, the learner will be exposed to the contribution of Sanskrit Literature to nationalistic thoughts in wider perspective.
- This course will make the student acquainting with the broad spectrum of Indian nationalism trends as depicted in the ancient classical and modern Sanskrit literature.

### GE-5 – Ethical and Moral Issues in Sanskrit Literature

- This course will enable the students to appreciate the conflict and peace resolution.
- The course will make the students to understand and analysing the issues and their solutions depicted in Ramayana and Mahabharata in the context of Indian tradition.
- It is supposed to create an awareness about self-respect and freedom with the Idea of swadharma.
- This course aims to get the students familiar with the Ethical and Moral Values as depicted in Sanskrit Literature.

### GE-6 – Basics of Sanskrit Linguistics

- This course will enable the students to appreciate and develop a scientific approach to the study of languages and its structure i.e. Phonology and Phonetics, Morphology and syntax etc. in the context of Sanskrit linguistics.
- The course will make the learner capable of analysing the words and their meanings including semantic changes based on established linguistic theories.
- It is supposed to create an awareness about the pragmatics approach in the study of meaning in the context of the linguistic study.
- This course will introduce the basic fundamental of linguistics based on Sanskrit Language.

## 10.5 Skill Enhancement Courses

### AEEC-1 – Basic Elements of Jyotisa

- This course will enable the students to appreciate the general introduction of Jyotiṣa Shastra – the traditional Hindu system of astrology based on the text of Jyotiṣachandrikā.
- The course will make the learner capable of analysing the different astrological concepts and its utility in the contemporary life of a human being and to know the planetary influence.
- It is supposed to create an awareness about the preparation of a calendar (Panchanga system) to determine the date for auspicious rituals and make major decisions.
- The objective of this course to introduce basic elements of the Jyotiṣa to the students.

## AEEC-2 – Indian Architecture System

- This course deals with the fundamental principles of the science of Indian Architectural system (Vastushastra) starting from design, layout, measurement, ground preparation and space arrangement etc.
- The course will make the learner able to understand and aware of the use of five elements (Pancha Mahabhuta) in the construction process.
- The aims of this course to get the students to know about the basic principles of ancient Indian architecture system.
- It is also intendes to give an elementary understanding of vastuvidya and to enable the students to learn the town planning and construction of residential houses starting from design, layout, measurement, ground preparation and space arrangement etc. according to vastu.

## AEEC-3 – Basic Elements of Ayurveda

- This course will enable the students to appreciate the principles of traditional Indian medicine system which has focused not only to physical health but a healthy life style including food habits, diets, preventive medicine, medicinal plants available in their surroundings.
- The course will make the learner able to know the history of Ayurveda through original sources of ancient medicine in Sanskrit texts i.e. Charaksamhita, Sushruta-samhita and Ashtanghridaya.
- They also get basic knowledge of physiology, health care, the way of diagionising the illness and preventive medicine.
- The major objective is to understand the basic principles and concepts of preventative medicine and health maintenance, diet and nutrition, usage of commonly used spices and herbs and outline of Āyurvedic therapeutic procedures in Āyurveda.

## AEEC-4 – Computer Awareness for Sanskrit

- Learn the Basic Computer Awareness includes Design, Architecture: Operating System.
- Learn the MS Office Tools (Word, Power points, Excel etc.).
- Learn the Standard for Indian Languages (Unicode).
- Working knowledge of HTML and web page development.
- Working knowledge of CSS and JavaScripts.

## AEEC-5 – E-Learning Tools and Techniques for Sanskrit

- Learn the Various Typing Tools and Software for Devanagari Unicode.
- Learn the Text preservation techniques and web publishing.
- Learn the E-Content Creation for Sanskrit Text.
- Learn the Survey of E-learning tools and Techniques.
- Student also learn the Optical Character Reader (OCR), Applications of OCR for Sanskrit and Indian Languages, Tool and Techniques, Survey of the OCR.

## AEEC-6 – Yogasutra of Patanjali

- This course will enable the students to appreciate the Indian system of yoga.

- The course will make students capable of understanding Yogasutra of Patanjali and help to acquire the necessary tools for a balanced life.
- It is supposed to create an awareness about how to concentrate your body fit and fine and lead to a successful life.
- For this, selected Sutras of Patanjali's Yogasūrta has been prescribed for basic knowledge of yoga darshana.

### AEEC-7 – Indian Theatre

- After going through this course students will be able to know about several theoretical aspects of theatrical performance and production.
- They will become aware of the many types of theatres, their design and stage setting, acting, dress and makeup etc.
- Students also become familiar with the main principals of theatre performance and appreciation.
- The objectives of this curriculum are to help students are identify the richness of drama and to become aware of the classical aspects of Theatre.

## 11. B.A (PROGRAMME) HINDI

### 11.1 Compulsory Language Course

### BAPAECC01 – Hindi Bhasha Aur Sampreshan

- Introduction of the student to the forms and principles of linguistic communication.
- Information on various media, importance of effective communication prepares for employment.
- Undergraduate students will be exposed to an understanding of linguistic communication and various aspects of communication.
- Will be able to get acquainted with the correct pronunciation of the language, general writing, creative writing, and technical words.

### 11.2 Core Courses

### BAPHCC01 – Hindi Bhasha Aur Sahitya Ka Itihas

- Will get an introduction to the history of Hindi language and literature.
- Develop a critical understanding of the major trends of different periods of literary history.
- Hindi language and literary history can be presented in a balanced way through critical analytical knowledge towards history.
- To develop a poetic understanding through the study and analysis of specific poems.

### BAPMILHA01 – Hindi Bhasha Aur Sahitya

- Develop general knowledge of Hindi language and literature.
- Introducing the status of Hindi as the national language, official language and contact language.
- Will develop a clear understanding of Hindi literature and language development.

- According to modern requirements, information about national language, official language and contact language will be available.

BAPMILHB01 – Hindi Bhasha Aur Sahitya

- To develop general knowledge of Hindi language and literature.
- To develop a poetic understanding through the study and analysis of specific poems.
- Will develop a clear understanding of Hindi literature and language development.
- The study of specific poems will develop the understanding of literature.

BAPMILHC01 – Hindi Bhasha Aur Sahitya

- To develop general knowledge of Hindi language and literature.
- To develop a poetic understanding through the study and analysis of specific poems.
- Will develop a clear understanding of Hindi literature and language development.
- The study of specific poems will develop the understanding of literature.

BAPHCC02 – Hindi Kavita (Madhyakaal Aur Aadhunik Kal)

- To acquaint the students with the medieval and modern poets of Hindi.
- To give information about the literature of the time through the main poems.
- Learn the method of study analysis of poems.
- You will get information about the socio-political-cultural aspects of literature.

BAPMILHA01 – Hindi Bhasha Aur Sahitya

- Develop general knowledge of Hindi language and literature.
- Introducing the status of Hindi as the national language, official language and contact language.
- To develop a poetic understanding through the study and analysis of specific poems.
- Will develop a clear understanding of Hindi literature and language development.
- According to modern requirements, information about national language, official language and contact language will be available.

BAPMILHB01 – Hindi Bhasha Aur Sahitya

- To develop general knowledge of Hindi language and literature.
- To develop a poetic understanding through the study and analysis of specific poems.
- Will develop a clear understanding of Hindi literature and language development.
- The study of specific poems will develop the understanding of literature.

BAPMILHC01 – Hindi Bhasha Aur Sahitya

- To develop general knowledge of Hindi language and literature.
- To develop a poetic understanding through the study and analysis of specific poems.
- Will develop a clear understanding of Hindi literature and language development.
- The study of specific poems will develop the understanding of literature.

BAPHCC03 – Hindi Katha Sahitya

- Introduction to the origin and development of Hindi fiction.
- Prose literature analysis.

- Introduction to the Development of Fiction.
- Study of major novels and stories.

BAPMILHA02 – Hindi Gadya : Udbhav Aur Vikas

- Introducing different genres of Hindi prose.
- To develop an understanding of modern literature through various works.
- Will get an introduction to the development of Hindi prose literature.
- Study analysis of works will develop literary understanding.

BAPMILHB02 – Hindi Gadya : Udbhav Aur Vikas

- Introducing different genres of Hindi prose.
- To develop an understanding of modern literature through various works.
- Will get an introduction to the development of Hindi prose literature.
- Study analysis of works will develop literary understanding.

BAPMILHC02 – Hindi Gadya : Udbhav Aur Vikas

- Introducing different genres of Hindi prose.
- To develop an understanding of modern literature through various works.
- Will get an introduction to the development of Hindi prose literature.
- Study analysis of works will develop literary understanding.

BAPHCC04 – Anya Gadya Vidhayein

- Developing understanding of Hindi non-fiction prose.
- Introducing the methods of analysis of genres like essay, memoir, sketch, satire etc.
- Clear understanding of other prose genres will be developed.
- Critical understanding will develop.

BAPMILHA02 – Hindi Gadya : Udbhav Aur Vikas

- Introducing different genres of Hindi prose.
- To develop an understanding of modern literature through various works.
- Will get an introduction to the development of Hindi prose literature.
- Study analysis of works will develop literary understanding.

BAPMILHB02 – Hindi Gadya : Udbhav Aur Vikas

- Introducing different genres of Hindi prose.
- To develop an understanding of modern literature through various works.
- Will get an introduction to the development of Hindi prose literature.
- Study analysis of works will develop literary understanding.

BAPMILHC02 – Hindi Gadya : Udbhav Aur Vikas

- Introducing different genres of Hindi prose.
- To develop an understanding of modern literature through various works.
- Will get an introduction to the development of Hindi prose literature.
- Study analysis of works will develop literary understanding.

## 11.3 Discipline Specific Elective Courses

### BAPHDSE01 – Hindi Bhasha Ka Vyavharik Vyakaran

- Providing theoretical and practical knowledge of translation.
- Knowledge of the nature of translation in different fields.
- Theoretical and practical knowledge of translation.
- Analytical study of translation in different fields, experimental work.

### BAPHDSE02 – Hindi Ka Maukhik Sahitya Aur Uski Parampara

- Folk life and culture information.
- Attraction will develop in tourism and music-dance etc.
- Introduction to Oral Literature.
- Ability to analyse culture and folk-life and culture.

### BAPHDSE03 – Hindi Rangmanch

- Along with the development of theatre, you will get information about different genres.
- Will be able to get acquainted with the vision of prominent thinkers.
- Develop an understanding of traditional and modern theatre.
- Bharat Bodh will develop.

### BAPHDSE04 – Sahitya Chintan

- The study of organs, appendages, literary distinctions, strains, essential for the interpretation of literature.
- Building a critical conscience along with the mutual significance and importance of literature and society.
- Acquire knowledge of classical principles for the interpretation of literature.
- To develop an understanding of literature as well as other arts while enriching the level of theoretical thinking and understanding of the students.

### BAPHDSE05 – Kosh Vigyan : Sabdkosh Aur Vishvakosh

- Develop an understanding of cytology.
- To develop an interest in its practical application, manufacture and dissemination of technology understanding will develop.
- Will have information about various KOSH.
- Develop an understanding of creation, dissemination, and technology.

### BAPHDSE06 – Vishesh Adhyayan : Ek Pramukh Sahityakar : Kabir

- To try to find an understanding and thoughtful direction of various issues of life and society through the couplets and verses prescribed in the syllabus.
- Will be able to understand the political-socio-cultural religious conditions of Bhakti period.
- Social harmony will develop in the student through the social consciousness of Kabir-poetry.
- Human and moral values will be developed.

### BAPHDSE0601 – Vishesh Adhyayan : Ek Pramukh Sahityakar : Tulsidas

- Study analysis of literature of important poet of Bhakti period Tulsidas.
- A Critical Study of the Life and Literature of Tulsidas.
- Story, Introduction, Literature and Analysis of Tulsidas.
- Study analysis of various dimensions of Tulsidas's literature

### BAPHDSE0602 – Vishesh Adhyayan : Ek Pramukh Sahityakar : Premchand

- Introduction, Literature and Analysis of Emperor Munshi Premchand.
- Story of Munshi Premchand.
- Analyse his teachings from his writings.
- Study analysis of various dimensions of Premchand's literature.

### BAPHDSE0603 – Vishesh Adhyayan : Ek Pramukh Sahityakar : Nirala

- Biography and literary contribution of the great poet Nirala.
- To study his surroundings and the struggle of the poet.
- Study analysis of the literature of the great poet Nirala.
- Understanding of the poet's environment.

## 11.4 Generic Elective Courses

### BAPHGE01 – Anuvad : Vyavahar Aur Siddhant

- Develop an understanding of the practice and theory of translation.
- Build translation proficiency to suit the demands of different sectors.
- Will help in understanding the need of different areas of translation.
- Practical knowledge will be built along with theoretical knowledge.

### BAPHGE02 – Janpadiya Sahitya

- Linking district lifestyle and literature to the mainstream of study.
- To develop an understanding of folk culture.
- Information about tourism, literature and dialects will be available.
- Will get information about the study analysis of folk literature.

### BAPHGE03 – Asmitamulak Adhyayan Aur Hindi Sahitya

- Theoretical and practical knowledge of identities.
- Sensitive analysis through study of key works.
- Knowledge of identity discourse.
- Understanding the problems of different identities and their environment.

### BAPHGE04 – Hindi Cinema Aur Uska Adhyayan

- Develop a practical understanding of the making and consumption or criticism of cinema.
- Study of Development of Hindi Cinema and Develop a practical and critical understanding of cinema.
- Understanding the changes taking place in cinema through some of the major films.
- Through the development of cinema, you will be able to understand the changes coming in the entertainment world of India.

### 11.5 Skill Enhancement Courses

#### BAPHSEC01 – Rachnatmak Lekhan

- Developing creative skills in students.
- The development of creativity is helpful in getting employment in various fields like journalism, media, advertising, cinema, writing and arts etc.
- Will help you to learn to organize your ideas whether you are working on a short story, novel, play, or screenplay.
- Will help in improving your communication skills.

#### BAPHSEC02 – Bhasha Shikshan

- Students will be able to get acquainted with the concept and importance of language teaching.
- After acquiring various linguistic skills, students will be able to develop their talents in the fields of teaching.
- Student will develop in the fields of media, acting etc.
- Students will move towards researching new methods in the field of education and training.

#### BAPHSEC03 – Karyalayi Hindi

- Providing practical knowledge about official language.
- Identifying various office requirements.
- Learn different forms of various official correspondence
- Develop an understanding of noting, drafting and summarizing requirements.

#### BAPHSEC04 – Bhashayi Dakshata

- Development of fast reading and silent reading among students.
- Development of linguistic proficiency.
- Increase in the working efficiency of the students.
- Summarization of the subject and development of skill of Pallavan.

#### BAPHSEC05– Vigyapan Aur Hindi Bhasha

- Language proficiency in terms of ad writing.
- Understanding the whole process of ad creation.
- Familiarity with the reach and dissemination potential of various media in the advertising market.
- Making ready for copywriting tasks.

#### BAPHSEC06 – Computer Aur Hindi Bhasha

- Develop an understanding of the current state of computers.
- To develop practical knowledge of Hindi on computer.
- Emphasis on use of Hindi language on computer.
- Will develop theoretical and practical knowledge.

## 12. B.A (PROGRAMME) ECONOMICS

## 12.1 Discipline Specific Core Courses

### PD11 – Principles of Microeconomics I

- The students learn some basic principles of microeconomics.
- They learn about the interactions of supply and demand, characteristics of perfect competition, efficiency and welfare.
- This course intends to expose the students to the basic principles in Microeconomics and their applications.
- The course will illustrate how microeconomic concepts can be applied to analyse real-life economic situations.

### PD21 – Principles of Microeconomics II

- This course helps the students to understand different forms of market imperfections and market failures observed in real life situations.
- The students learn about the environment where the standard market mechanism fails to generate the desirable outcomes.
- They develop a sense of how the production is distributed among the different factors of production and the demand for inputs.
- Some preliminary concepts of international trade are also covered in this course.

### PD31 – Principles of Macroeconomics I

- This course is useful for understanding various real economic issues and evaluating policy outcomes.
- This course introduces students to the basic concepts in Macroeconomics. Macroeconomics deals with the aggregate economy.
- In this course the students are introduced to the definition, measurement of the macroeconomic variables like GDP, consumption, savings, investment and balance of payments.
- The course also discusses various theories of determining GDP in the short run.

### PD41 – Principles of Macroeconomics II

- This course provides students with an analytical framework to understand the basic functioning of the macroeconomy.
- It also allows them to critically examine and comment on effectiveness of various policies.
- This is a sequel to Principles of Macroeconomics I. It analyses various theories of determination of National Income in greater detail.
- It also introduces students to concept of inflation, its relationship with unemployment and some basic concepts in an open economy.

## 12.2 Discipline Specific Elective Courses

## PDE51 – Environmental Economics

- The module aims to introduce students to the main concepts in environmental economics, equip students with a thorough analytical grasp of environmental policy theory, starting with externalities, and familiarise students with the main issues in environmental valuation.
- At the end of the module the students should be able to demonstrate their understanding of the economic concepts of environmental policy.
- Use diagrammatic analysis to demonstrate and compare the economic welfare effects of various environmental policy options.
- Demonstrate their understanding of the usefulness and problems related to environmental valuation.

## PDE52 – Money and Banking

- It allows students to analyse financial market outcomes and evaluate policies.
- This course exposes students to the theory and functioning of the monetary and financial sectors of the economy.
- It highlights the organization, structure and role of financial markets and institutions.
- It also discusses interest rates, monetary management and instruments of monetary control.
- Financial and banking sector reforms and monetary policy with special reference to India are also covered.

## PDE53 – Economic Development and Policy in India I

- This course will help students understand the key issues related to the Indian economy.
- It will broaden their horizons and enable them to analyse current economic policy thus improving their chances of getting employed.
- It will be more effective, in positions of responsibility and decision making.
- This course reviews major trends in aggregate economic indicators in India and places these against the backdrop of major policy debates in India in the post-independence period.

## PDE61 – Public Finance

- The module aims to introduce students to the main concepts in public finance, equip students with a thorough analytical grasp of government taxes: direct and indirect taxes, and familiarise students with the main issues in government expenditure.
- At the end of the module the students should be able to demonstrate their understanding of the economic concepts of public finances.
- Use diagrammatic analysis to demonstrate and compare the economic welfare effects of various government policy options.
- Demonstrate their understanding of the usefulness and problems related to government revenues and expenditures.

## PDE62 – Economic Development and Policy in India II

- Students will have capability to understand government policies.

- It will enable informed participation in economic decision making, thus improving their employment prospects and career advancement.
- The course seeks to equip students with sector-specific knowledge and skills to analyse key economic issues and policy documents.
- It will also enable them to relate theoretical frameworks of macroeconomics and microeconomics to the Indian context.

### PDE63 – Economic History of India

- The course exposes students to the intricacies of India's economic, political and social developments both in the past and present times.
- It develops their analytical skills that will be useful in a variety of careers in academics, research, journalism, private sector and government.
- This course analyses key aspects of Indian economic development during the second half of British colonial rule.
- In doing so, it investigates the mechanisms that linked economic development in India to the compulsions of colonial rule.

## 12.3 Generic Elective Courses

### PGE51 – Principles of Microeconomics

- The students learn some basic principles of microeconomics.
- They will learn about the interactions of supply and demand, characteristics of perfect competition, efficiency and welfare.
- This course intends to expose the student to the basic principles in Microeconomics and their applications.
- The course will illustrate how microeconomic concepts can be applied to analyse real-life economic situations.

### PGE52 – Issues in Economic Development

- Students will develop a critical understanding of the contemporary issues in Indian economic development.
- Students will thus be better prepared to face the professional world.
- Use this knowledge base in a variety of jobs, including in the corporate, civil service and NGO sectors.
- This course exposes students to some of the key ideas and concepts in the areas of economic growth, human development and globalisation.

### PGE61 – Principles of Macroeconomics

- This course is useful for understanding various real economic issues and evaluating policy outcomes.
- This course introduces students to the basic concepts in Macroeconomics.
- In this course the students are introduced to the definition, measurement of the macroeconomic variables like GDP, consumption, savings, investment and balance of payments.

- The course also discusses various theories of determining GDP in the short run.

### PGE62 – The Indian Economy

- Students will develop a critical understanding of the contemporary issues in the Indian economy.
- Students will thus be better prepared to face the professional world.
- Use this knowledge base in a variety of jobs, including in the corporate, civil service, and NGO sectors.
- This course exposes students to some of the key ideas and concepts in the areas of growth and structural change, poverty, education, health, gender, industry, services and international trade.

## 12.4 Skill Enhancement Courses

### PS31 – Understanding Economic Survey and Economic Budget

- Students will have the capability to understand government policies and will be informed participants in economic decision-making.
- The course seeks to familiarise students with basic concepts related to the Economic Survey and Union Budget.
- It aims to equip students with sufficient knowledge.
- Students will learn the skills to analyse these documents.

### PS41 – Research Methodology

- The student will develop an understanding of how commonly available data is collected and analysed.
- This would help in the interpretation of secondary data and in the management of small primary surveys.
- This course is designed to provide students skills for collecting and analysing data to answer real world problems.
- It will cover modes of data collection, data cleaning and data representation.

### PS51 – Data Analysis

- The students will be instructed on the use of spreadsheet and statistical software to analyse data.
- Software used for the course will vary based on what is available.
- Open access software such as R will be encouraged.
- Students will learn to input, visually represent and analyse data.

# 13. B.A (PROGRAMME) PHILOSOPHY

## 13.1 Discipline Specific Course Courses

### MIL I – Introduction to Logic

- To learn identifying different types of arguments as well as their premises and conclusions.
  To be able to evaluate arguments and identify mistakes in reasoning.
  To learn how to prove the validity and invalidity of arguments using method of Rules and Fallacies and also by Truth Table method.
  To develop the overall reasoning skills of the students which are useful in various competitive exams.

### MIL II – Ethical Studies

- Awareness of ethical issues and basic ethical approaches.
- Improved writing skills and understanding of ethical conflict.
- To familiarise students with basic ethical theories.
- To create ethical awareness to help them in dealing with issues around them.

### MIL III – Introduction to Indian Philosophy

- Students will appreciate the Indian Metaphysics of various ancient Indian schools such as Charvaka, Buddhism, Jainaism, Samkhya, Mimamha and Vedanta.
- They will become aware of the Metaphysics of various schools which will help them to understand the society at large.
- Students will gain familiarity with the epistemology of Charvaka and Nyaya - Vaishesika system.
- Students will learn to develop scientific, logical and rational inquiry for understanding the systems.
- Students will able to do a comparative analysis of all systems which will further enhance their debating skills.
- Students will develop the ability to think critically and to read and analyse scientific literature.
- Students will develop strong oral and written communication skills through the effective presentation of Projects, Quiz as well as through Seminars.

### MIL IV – Introduction to Western Philosophy

- It will make students witness how philosophers who were either predecessors or contemporaries evaluated the theories of others.
- It will advise them in distinguishing good arguments from bad arguments.
- It will enable students to have a better understanding of how a man thinks and what goes on into the making of human thought.
- It will also make students aware that there is no place for superficial approach to the complex questions in life.

### DSC 1 – Logic

- Helps in sharpening the reasoning and argumentation skill of a learner and simultaneously helps in identifying the flaws.

- Enhances the analytical skills, so that one can resolve the difficult issues and finally arrives at a reasonable solution.
- Helps in good scoring for a better rank in form of result.
- It trains the student to construct good and sound arguments rejecting the vague and unsound ones at any point of time and situation.

### DSC 2 – Ethics

- This curriculum should enable students to develop ability for moral reasoning and act with ethical deliberations.
- After studying ethics, one is equipped with the ethical sensitivity and moral understanding required to solve complex ethical dilemmas.
- The course is designed to grasp the traditional ethical (Western and Indian) theories as well as to help students apply it on the practical front.
- It is a curriculum which enables students to develop ability for moral reasoning and act with ethical deliberations.

### DSC 3 – Indian Philosophy

- At a macro level, the Indian contribution to global philosophy is still not recognised in the same manner as Western Philosophy.
- It should also be the endeavour to promote the Indian way of life encapsulating Indian values, ethos and cultural context.
- As future citizens, students should go out of the university fully aware of Indian philosophical tradition and should be indeed part of it.
- Unless they feel part and parcel of this thought processes, they would not be able to contribute any value addition to their job profile.

### DSC 4 – Modern Western Philosophy

- This course will enable students to think outside the box of the prevalent philosophical orthodoxies.
- The history of philosophy trains the mind to think differently and alternatively about the fundamental problems of philosophy.
- Understand the core philosophical ideas of Western traditions and the problems that led to the empiricist and rationalist uprising in philosophy.
- Learning about various positions on metaphysical monism, dualism and pluralism.
- Knowledge of the Copernican Revolution brought forth by Kant, in the examination of the conditions which makes knowledge possible.

## 13.2 Discipline Specific Elective Courses

### DSE I – Vedic Value System

- The student must fully understand the reverence of the Vedic Values in the contemporary world.
- This course will help develop an understanding about the importance of the Nature (Cosmos) and help student pursuit a holistic existence.

- To critically evaluates the importance of Vedic values, ethos and Indian value system in life. It brings personal and social growth.
- They should be able to contribute value addition for the betterment of society and themselves.

### DSE II – Buddhism

- At the end of the course, a student should be able to demonstrate a clear understanding of the background to the origin of Buddhism in India.
- Students have acquired a good understanding of the key doctrines of Buddhism.
- They have the sound understanding of Buddhist epistemology, metaphysics, ethics and shall be able to go for further studies in the subject.
- Comprehensive understanding of the philosophy of Indian Buddhism.

### DSE III – Greek Philosophy

- This course will provide students with a seminal awareness of the Western Classical Philosophical tradition.
- It gives them clarity on classics.
- The course is intended for giving a comprehensive account of Greco-Roman Philosophy to undergrad students pursuing a BA Programme course with Philosophy as one of their disciplines.
- It also exposes them to Socrates and the Sophists.

### DSE IV – Social and Political Philosophy: Indian and Western

- to make students better citizens by understanding the notion of democracy.
- to know rights of Individuals and communities.
- to learn to live in cohesive manner in a multicultural setup.
- to study different thinkers who have given their theories in understanding the society and principles of the governance.

### DSE V – Applied Ethics

- The course shall give a vision that merges the social with ethical understanding of choices.
- The issues in human lives that touch each one of us must be synergised for all and this course makes that outcome a good possibility.
- The objective is to make students aware of Ethical tools that must be used to resolve moral and ethical issues around us.
- Improving analytical and writing skills.

### DSE VI – Jainism

- At the end of the course, a student should be able to demonstrate a clear understanding of the background to the historical relevance of Jain philosophy.
- Students will acquire a good understanding of the key doctrines/concepts of Jain tradition.

- They will have the sound understanding of Jain epistemology, metaphysics, ethics, its practical relevance in today's contemporary scenario and shall be able to go for further studies in the subject.
- This course aims at providing student's with a comprehensive understanding of Jain Philosophy comprising: historical relevance of Jain Trithankaras, Jain epistemology, Jain metaphysics, Jain ethics and its practical relevance in today's contemporary scenario.

## DSE VII – Philosophy of Religion

- Philosophy of religion develops a critical approach in the students.
- They are able to form an informed opinion regarding various issues concerning religion.
- The objective is to acquaint students with the basics of religion.
- The students are then introduced to a systemic and comprehensive study of various approaches to concepts that are common across religions.

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## DSE VIII – Feminism

- Study of Feminism arms the student with analytical skills to develop valid arguments to counter gender discrimination, sexism and patriarchal dominance.
- Feminist theory has a social agenda i.e. to initiate transformation in social structures, customs and practices.
- Thus, the study of Feminism is not only an empowering tool against gender oppression but also against other systems of oppression such as race, class and colour.
- It seeks to create gender sensitisation and develops a wholistic approach towards education.

## DSE IX – Aesthetics

- The course with its inter-disciplinary content, and with the curriculum that offers an insight into art and culture.
- It will ensure students with a foundational basis to find a career in the fields of art and media.
- This course is for the undergraduate students pursuing a BA (P) course with Philosophy as one of the two main disciplines.
- The course is focused upon a comprehension of the Philosophy of art in relation to creativity, communication, culture and aesthetic experience.

## DSE X – Analytic Philosophy

- The method and methodology of Analytic Philosophy allows it to register a presence in diverse domains of thought including epistemology, phenomenology, metaphysics, ethics, political philosophy and feminist discourse.
- The course, "Issues in Analytic Philosophy" seeks to help students understand its terminology and method via its workings in certain interconnected sub traditions such as metaphysics and epistemology, philosophy of mind and philosophy of language.
- As a philosophical tradition it is characterized by an emphasis on, scientific rigor, argumentative precision and logical clarity in the development of thought and concept.

- Its familiar tools are formal logic, conceptual analysis, and, mathematics.

## 13.3 Generic Elective Courses

### GE 1 – Fundamentals of Indian Philosophy

- Students will appreciate the Indian Metaphysics of various ancient Indian schools such as Charvaka, Buddhism, Jainaism, Samkhya,Mimamha and Vedanta. They will become aware of the Metaphysics of various schools which will help them to understand the society at large.
- Students will gain familiarity with the epistemology of Charvaka and Nyaya - Vaishesika system.
- Students will learn to develop scientific, logical and rational inquiry for understanding the systems.
- Students will able to do a comparative analysis of all systems which will further enhance their debating skills. Students will develop the ability to think critically and to read and analyse scientific literature.

### GE II A – Technology and Ethics

- Students' enhanced ability to analyse the impact of technology on social, political, economic and legal issues from an ethical point of view.
- They will responsibly function and lead the usage to technology so as to save society from its harmful effects.
- With an increased ethical sensitivity and an improved ethical judgment capacity, they will be expected to advocate for the best practices of technology with its ethical implications.
- They will understand the development of technology and the importance of its ethical usage so that they become ethical citizens in a digital world.

### GE IIB – Ethics

- This curriculum should enable students to develop ability for moral reasoning and act with ethical deliberations.
- After studying ethics, one is equipped with the ethical sensitivity and moral understanding required to solve complex ethical dilemmas.
- The course is designed to grasp the traditional ethical (Western and Indian) theories as well as to help students apply it on the practical front.
- It is a curriculum which enables students to develop ability for moral reasoning and act with ethical deliberations.

### GE III – Philosophical thoughts of Ambedkar

- Learn Ambedkar’s alternative reading of Indian philosophy by interrogating dominant philosophical systems and its texts.
- Critical engagement with social reality conditioned by the caste system.
- Learn the liberative and democratic potential of philosophy of Ambedkar in reconstructing Indian nation.

- To make good citizen by understudying the indigenous democratic philosophical thought.

### GE IVA – Inductive Logic

- This paper provides a sketch for evaluation on the basis of observation and experiment.
- It helps the student learn how to move forward or how to arrive at general conclusions on the basis of individual data.
- It provides a well formulated background for Scientific studies.
- It also enables the learner to know about analogy, experimental method and hypotheses.

### GE IVB – Logic

- Helps in sharpening the reasoning and argumentation skill of a learner and simultaneously helps in identifying the flaws.
- Enhances the analytical skills, so that one can resolve the difficult issues and finally arrives at a reasonable solution.
- Helps in good scoring for a better rank.
- It trains the student to construct good and sound arguments rejecting the vague and unsound ones at any point of time and situation.

## 13.4 Skill Enhancement Courses

### SEC I – Ethical decision Making

- This course would enable developing an ability to use theories of standard Ethics and reflective morality to resolve the real-life issues and concerns.
- In other words, this course would facilitate a skill in addressing issues that ensue moral dilemmas or the 'trolley problems".
- This course is primarily focused to develop a skill of resolving ethical dilemmas in personal and professional spaces.
- The paper offers us insight into the process, nature and ethics involved in the larger realm of decision making.

### SEC II – Yoga Philosophy

- Highlight the positive contribution of this paper and in what way some of the thought processes are better than its Western counterpart.
- It should also be the endeavour to promote the Indian way of life encapsulating Indian values, ethos and cultural context.
- As future citizens, students should go out of the university fully aware of Indian philosophical tradition and should be indeed part of it.
- As Indian Philosophy projects another type of aspect of life which has not been explored by the student before.
- It brings personal growth and unless they feel part and parcel of this thought processes, they would not be able to contribute any value addition to their job profile.

### SEC III – Art and Film Appreciation

- It is a skill to develop and enhance philosophical analysis and contextualizing in terms of Rasa, empathy and disinterestedness.
- The objective of the course is to enable a student to become an active and engaging viewer of art and cinema.
- To discern the aesthetic experience as different from art experience.
- To enable a student to understand and appreciate films and other related art forms.

### SEC IV – Critical Thinking and Decision Making

- Helps in generating productive/creative ideas for further use in difficult situation.
- Creates enthusiasm for taking a risk of dealing with difficult issues and finding a way out for solution.
- Provides valuable intellectual traits like how to critically read, listen and write and develop faith in reason and encourage a flair for fairness and justice.
- As a result, a learner learns step by step how to arrive at an ideal solution keeping in mind all situational factors.
- Provides clarity in thinking as well as proper understanding of an issue to make it precise for further analysis.
- Helps to use the skills of observation, analysis and evaluation and also provides sound reason for doubting and questioning.
- Finally, the learner becomes self-directed, self-monitored and self-corrective through this process of reflective thinking, and can proceed for right choice.

## 14. B.A (PROGRAMME) POLITICAL SCIENCE

### 14.1 Discipline Specific Core Courses

### Paper I – Introduction to Political Theory

- Understand the nature and relevance of Political Theory.
- Understand different concepts like liberty, equality, justice and rights.
- Reflect upon some of the important debates in Political Theory.
- This course aims to introduce certain key aspects of conceptual analysis in political theory and the skills required to engage in debates surrounding the application of the concepts.

### Paper II – Indian Government and Politics

- Demonstrate an understanding of the different viewpoints on Indian politics and the nature of Indian state.
- Show knowledge of the text of the Indian Constitution and an awareness of constitutional and legal rights.
- Understand the structure of society in India and how social inequalities have an impact on political institutions and processes.
- Show awareness of the party system in India and the development policies adopted by various governments so far.

- Understand how social movements are formed and how they impact the political processes.

### Paper III – Comparative Government and Politics

- The paper will equip students with an in-depth understanding of nature, and scope of comparative politics.
- The course will enhance student's understanding of comparative analysis both in developed and developing countries.
- The course will enable students in understanding historical context of modern state, constitutional development and their political economy with specific references; such as capitalism as a case of reference to Britain, socialism with reference to China, colonialism and decolonization with reference to Brazil and Nigeria.
- The course will develop analytical skills of students to discuss the contemporary debates on the changing nature of state in the context of globalisation.

### Paper IV – Introduction to International Relations

- Students will learn about major theoretical approaches and the history of International Relations.
- The course will enhance students' understanding on the major political developments in international relations since 1945.
- The paper will develop in-depth knowledge on the emerging centres of power like European Union, China, Russia and Japan.
- Students will also learn about basic determinants of India's foreign policy and understand it in the context of India as an emerging power.

## 14.2 Discipline Specific Elective Courses

### DSE I – Themes in Comparative Political Theory

- Understand how political theory is shaped from western and Indian traditions.
- Appreciate the value and distinctiveness of comparative political theory.
- Explain the conceptual resources in political theory.
- It also covers Indian and Western thought.

### DSE II – Administration and Public Policy: Concepts and Theories

- How it is different from private administration.
- Students also learn about the evolution and changing contours of this discipline from classical to contemporary theories.
- Students receive an insight into development administration.
- They are exposed to perspectives on public policy.

### DSE IV – Democracy and Governance

- Demonstrate knowledge of the constitutional structure of democracy in India.

- Demonstrate knowledge of the working of the democratic institutions of governance such as Parliament, Courts, etc.
- Show awareness of policy making process within democratic institutions.
- Show awareness of institutional practices of regulation, lobbying, etc.

### DSE V – Understanding Globalization

- The students will learn about meaning and significance of globalization in contemporary times.
- The course will enhance students' understanding on economic, political, technological and cultural dimensions of globalization.
- Understanding the role of global actors in the process of globalization will enhance students' knowledge on world actors like United Nations, World Trade Organization and G-77.
- Students will also learn about contemporary pressing issues like global warming, poverty& inequality and international terrorism.

## 14.3 Generic Elective Courses

### GE-I – Understanding Gandhi

- Fundamental concept of Gandhi Philosophy.
- Understand concepts in a critical and analytical manner.
- Acquire skills to locate the texts in a broader and socio-historical context.
- Acquaint students with the social and political thought of Gandhi.

### GE-II – Human Rights, Gender and Environment

- The study of the course will equip the students with theoretical and conceptual understanding of caste, gender, ethnicity and class as distinct categories and their interconnections.
- The course will further analyse socio-economic and political problems of marginalised groups in society such as women, Dalits, minorities and adivasis and repercussions of globalisation on the m.
- The paper will enhance understanding on the meaning of human rights, universalization of human rights and human rights institutions in India.
- The course will equip students with a conceptual understanding of gender and patriarchy, and issues of women's political participation and rights in India.
- The paper will enhance knowledge on the concept of sustainable development, and national and international programmes and policies on environment.

## 14.4 Skill Enhancement Courses

### AE1 – Legislative Support

- Demonstrate knowledge of the structure and the functions of legislating bodies in India.
- Demonstrate knowledge of the law-making procedure in India.

- Acquire skills related to a close reading of legislative documents.
- Understand the relationship between the people and their elected representatives.
- Develop basic skills to become a part of a support team engaged at different levels of the law-making functions.

### AE2 – Public Opinion and Survey Research

- Understand the importance of public opinion in a democracy and the role of survey research in comprehending the working of a democratic political system.
- Learn about the methods used for conducting surveys and interpreting survey data.
- Acquire basic skill sets related to understanding public opinion formation and conducting research through the use of sample date, framing a questionnaire, etc.
- Acquire basic skill sets related to measurement of public opinion such as data analysis using statistical methods.

### AE3 – Your Laws, Your Rights

- Demonstrate understanding of law as a right.
- Understanding of democratic values like: equality, justice etc.
- Develop skills related to using ordinary legal procedures.
- Show the structure and principles of Indian legal system.

### AE4 – Conflict and Peace Building

- The course will enhance students' understanding on the meaning, nature and significance of peace, conflict management, conflict resolution and conflict transformation.
- The students will also learn the importance of resource sharing in the conflict zones.
- The paper will develop students' knowledge on ideological and socio-cultural dimensions of conflict at local, sub-national and international levels.
- Students will also learn about negotiation and mediation skill for conflict resolution through active listening, different tracks of diplomacy and Gandhian methods.

## 15. B.A (PROGRAMME) HISTORY

### 15.1 Discipline Specific Core Courses

### History of India from the earliest times up to c. 300 CE

- Delineate changing perceptions on 'Ancient/early' India.
- Explain the importance of archaeological sources for study of proto-history and recognize the belated growth of literacy.
- Distinguish between civilization and culture, particularly in the context of first ever civilization in the Indian subcontinent.
- Outline the key features of the first ever empire under the Mauryas.
- Locate the shift of historical focus from Gangetic belt to newer areas.

- Discuss the processes of assimilations of people and ruling houses from outside the Indian subcontinent in to the mainstream.

### History of India, c.300 to 1200

- Identify the historical importance of the accelerated practice of land grants issued by ruling houses.
- Delineate changes in the realm of polity and culture; puranic religion; the growth of vernacular languages and newer forms of art and architecture.
- Contextualize the evolution and growth of regional styles of temple architecture.
- Evolving role of these temples as centres of socio-economic and political activities.

### History of India, c. 1700 to 1950

- Trace the British Colonial expansion in the political contexts of 18$^{th}$ century India.
- Identify the key historiographical debates around the colonial economic policies.
- Delineate and explain the ideological, institutional and political formations of the anti-colonial nationalist movement.
- Discuss the colonial context of the emergence of communal politics in India.

## 15.2 Discipline Specific Elective Courses

### DSE I – Europe from the Middles Ages to the Renaissance (7$^{th}$ to 16$^{th}$ century)

- Interpret the importance and implications of periodization.
- Explain the development of what are conventionally called modern sensibilities in politics and the arts.
- Discuss the development of important institutions such as the Church and political formations such as the city-states.
- Point out the category of the ‘Renaissance’.

### DSE II – Economy and Politics: History of Capitalism and Colonialism I

- Define what is meant by capitalism, colonialism and imperialism.
- Delineate the crucial linkages between Atlantic slavery and European capitalism.
- Explain the global interconnectedness of capital.
- Examine the process of colonial expansion via trade.
- Discuss the linking of the non-European economies with the capitalist-dominated world market via case studies of certain commodities.
- Describe the significance of the American Revolution

### DSE III – Issues in 20$^{th}$ century World History-I

- Define world history and explain the evolving polities.
- Categorise the economies and cultures of the twentieth century world.

- Define the making of the geopolitical order and 'North-South' distinctions.
- Delineate the complex character of modernity and its differences.
- Demonstrate critical skills to discuss and analyse diverse social movements and cultural trends.

### DSE IV – History of Europe 1500-1848

- Define the role of Europe in the world.
- Define Reformation.
- Explain the scientific 'discoveries.
- Outline the contemporary state and politics.

### DSE V – Economy and Politics: History of Capitalism and Colonialism II

- Demonstrate implications of capitalist developments.
- Socio-economic impact of the developments.
- Discuss the nature of imperialist expansion and exploitation of weaker nations.
- Discuss the impact of imperialism on various colonies.

### DSE VI – Issues in 20th century World History-II

- Define world history.
- Discuss and explain the evolving politics, economies and cultures of the 20th century world.
- Analyse the interconnectedness in world history.
- Demonstrate critical skills to discuss diverse social movements and cultural trends.

## 15.3 Generic Elective Courses

### GE-I – Women in Indian History

- Provide an elementary outline of gender as a concept and patriarchy as a historically constituted system of power.
- Explore women's experiences within specific contexts at specific historical moments.
- Appreciate the contradictions that marked the 'rise' of powerful and 'exceptional' women like Razia, Nur Jahan or Mirabai.
- To discuss the material basis of women's experiences with reference to specific issues like ownership of property.

### GE-II – Gender in the Modern World

- Discuss the issues related to gender in world history in a comparative frame.
- Analyse gender realities in larger international context.
- Describe the main facets of Suffrage movement in Britain or in the USA.
- Delineate the role of women in anti-apartheid movement in South Africa.
- race the role of women in the Russian revolutions.
- Critically discuss the women's participation in Chinese revolution.

### GE-III – Culture and Everyday Life in India

- Identify the complex nature of relationship between the everyday life and society in urban India.
- Discuss human response to specific historical circumstance.
- Describe the role of Tea, Coffee and betel leave chewing in everyday cultural life and interactions.
- Delineate human interactions with each other in a shrine complex or on the streets.
- Analyse the importance of new avenues of interaction such as Metros, malls or pilgrim centres.
- Discuss the leisurely activities of social groups and resultant spread of ideas.

### GE-IV – Nature in Human History

- Critique an understanding of environmental concerns.
- Discuss environmental issues within a social-political framework.
- Examine complexities of resource distribution and inequalities of resource use.
- Locate solutions to environmental problems.

### GE-V – Investigating Inequalities

- Critique the prevalent dominant understanding of Caste, Gender and Tribe.
- Discuss the complex relations between differences and inequalities.
- Examine the inherent politics in creation of inequalities.
- Critically engage to prohibit caste-gender atrocities and upliftment of deprived sections of society.

### GE-VI – Delhi through the Ages

- Discuss the ecology of Delhi.
- Describe the archaeological structures that flourished in and around Delhi.
- Discuss various aspects of Revolt of 1857.
- Analyse the impact of Partition on the structure and settlement pattern of Delhi.

## 15.4 Skill Enhancement Courses

### SEC III – History and Archaeology

- Describe various stages of development of archaeology.
- Discuss the methods of excavation.
- Explain various dating methods employed by archaeologists.
- Interpret aspects of past societies.

### SEC IV – Archives and Museum

- Demonstrate the way in which museums are organized and managed.
- Contextualise how the heritage is preserved.
- Examine these two repositories of history from close quarters.
- Projects will involve visits to the museums and archives.

### SEC V – Popular Culture

- Engage with a range of theoretical perspectives in an attempt to define popular culture.
- Describe the methodological issues involved in a historical study of popular culture.
- Identify the relevant archives necessary for undertaking a study of popular culture, while pointing out the problems with conventional archives and the need to move beyond it.
- Interpret the above theoretical concerns to actual historical studies, through a case study.

### SEC VI – Language, Literature and Region in Early Modern Times

- Describe the chronology of the emergence and literalization of major languages in India.
- Analyse and articulate the various ways in which scholars have attempted to examine the histories and politics of languages, especially vis-à-vis the formation of regional, communal and national pride and identities.
- Identify and analyse the larger socio-political implications of the choice of a language, or a particular register of a given language, especially in literature and cinema.
- Justify that language function at multiple levels and in multiple facets of life.
- Examine the differences and why and how these are created has will be identified.

### SEC VII – Understanding Texts, Rituals and Orality in Indian History

- Organize archival or field work relating to historical research.
- Contextualise sources in a meaningful and critical manner.
- Point out ethnography of ritual practices and performances.
- Demonstrate a variety of vocational areas like: administration, development, culture, art etc.

### SEC VIII – Radio and Cinema in India: A social history

- Understanding the historical context for beginning of cinema.
- Analyse state's attempt to control and deploy radio.
- Explain how cinema reflected and engaged with the larger ideological and material tensions of society.
- Explain how Indian Cinema engaged with social and ideological issues of its time.

## 16. B.A (H) SOCIOLOGY

### 16.1 Core courses

#### Introduction To Sociology I:

- The students are introduced to the relationship between theory and perspectives.
- The students are introduced to the sociological theories which they learn in greater details during their later semesters.
- This paper also provides a foundation for sociological theories that are a part of papers in the subsequent semesters.
- The students learn critical thinking. They learn how to read, interpret and critique original work of various thinkers.

#### Sociology of India I

- The course lays the foundation of viewing images and ideas of India through a sociological lens. It further investigates sociological concepts and institutions in the Indian context.
- Through informed interrogation of images, ideas, concepts and institutions of India, the course contributes to the development of critical and analytical thinking.
- The course, supported by an interdisciplinary approach, facilitates learning and reflecting about the multiple – and contextual – socio-cultural registers of Indian society.
- Given the high standard/quality of the syllabus and use of innovative teaching-learning methods, the course prepares students to successfully compete in global academia.

#### Introduction to Sociology II

- The students are introduced to the relationship between theory and perspectives.
- The students are introduced to sociological theories which they learn in greater detail during the later semesters.
- This paper also provides a foundation for sociological theories that are a part of papers in the subsequent semesters.
- The students learn critical thinking skills. They learn how to read, interpret and critique original works of various thinkers.

#### Sociology of India II

- The course adds to the sociological interpretation of Indian history and society. The India-specific themes of the course – discourse/knowledge-making, mobilization, transformation, ideology, identity and politics, for example – are treated, moreover, by drawing from sociological concepts and theories. The course connects the practical and conceptual in terms of both substance and relevance.
- By focusing on the nuanced character of historical and social ideas and processes, the course sharpens the faculties of critical and analytical thinking and doing.
- The adoption of an interdisciplinary framework, without losing sight of the sociological, makes the course wider in scope and scale. It broadens viewpoints and encourages students to reflect deeply on the multicultural reality which is the defining feature of India.

- The course, in terms of both high quality syllabus-content and innovative teaching learning techniques, matches global standards. Consequently, it adequately trains students to compete in global academia.

## Political Sociology

- An ability to comprehend the embeddedness of political and the social in each other.
- Familiarity with different theoretical and conceptual issues in political sociology and a capacity to use them to grasp political phenomena in a cross-cultural and comparative perspective.
- Be able to understand and appreciate the diversity of ways in which politics operates historically and spatially to generate a more expansive notion of the realm of the political.
- Be able to understand the relationship between state and society in shaping politics in India both historically and analytically.

## Sociology Of Religion

- Students will be acquainted with representative texts that symbolize the development of knowledge in the field of Sociology of Religion.
- They will be able to identify different theories, approaches and concepts that make up the study of religion, distinguish between them and also use terms specific to the field in specific context.
- Students will be able to make a link between texts and paraphrase their arguments and use these to communicate their ideas in research papers, projects and presentations.
- By encompassing contemporary developments, the course enables students to think about linkages between religion and society at various levels.

## Sociology of Gender

- An understanding of concepts such as sex and gender by problematising common-sensical notions of gender.
- Raising key issues of power and subordination within the purview of gender and the need for and solutions resorted to as measures to initiate change through gender-based movements.
- Understanding issues relating to gender both at a national and global level.
- Places gender in juxtaposition with other forms of stratification and identity such as caste, class, family and work.

## Economic Sociology:

- Develops familiarity with different theoretical and conceptual aspects of economic sociology as a specialized branch of knowledge.
- Develops background knowledge about the diverse ways in which economy is interlinked with other aspects of society and culture.
- Acquire capacities to understand and analyse the transformations of economy and its key processes in a historical and comparative perspective.
- Develops abilities to generate research questions and arguments about the intersections of economy and society.

## Sociology of Kinship

- Grasp the historical evolution of kinship theories from a biological deterministic approach to culture of relatedness.
- Develop an analytical perspective on concepts relevant for understanding kinship.
- Comprehend the coexistence of multiple perspectives in the study of family, marriage and kinship.
- Acknowledge the significance of the emergence of new reproductive technologies on recasting kinship.

## Social Stratification:

- Students will learn about the socio-historical context of stratification theoretical concerns and problems and contemporary issues related to inequalities s and its forms.
- Inculcate in them a truly interdisciplinary approach in the study of society especially stratification in all its manifestations.
- Understanding of stratification and theories would sensitize students to its various sociological aspects, providing ample scope for applied learning and application.
- Examining forms of stratification, understanding the relevance of caste, race and ethnic identities in contemporary world.

## Sociological Thinkers –I

- Understanding the grand foundational themes of sociology.
- Application of theories and concepts from classical sociological theories.
- evelop intellectual openness and curiosity.
- Appreciation of the classical concepts and theories to develop awareness of the limits of current knowledge.

## Sociological Research Methods-I

- Students are introduced to sociological research both from a theoretical and methodological perspective. They understand the importance of research in social science.
- Students develop the ability to evaluate the methodological validity of the claims made by theory.
- The course enables students to evaluate a piece of research and move towards designing a simple research project.
- Identify the difference between quantitative and qualitative methods.
- Students will learn to identify ethical and practical issues in research. They also engage with the ideals of objectivity and reflexivity.
- Students learn that research methods are universal and not bound by cultural location.

## Sociological Thinkers –II

- Understanding the characteristics and dynamics of the social world.
- How post-classical sociologists attempt to understand the social world.
- Appreciating the relevance and limits of the contemporary theories or theoretical approaches to make sense of social reality.
- Understanding the basic methodological approaches of the thinkers, through some original texts and their role in building sociological knowledge.

### Sociological Research Methods-II

- Students are introduced to the concept of conducting research, which is inclusive of formulating research designs, methods and analysis of data. Some knowledge of elementary statistics is also provided to the students to acquaint them with quantification of data.
- The thrust of the course is on empirical reasoning, understanding and analysis of social reality, which is integral to the concepts of quantitative research. Students learn to differentiate between qualitative and quantitative aspects of research in terms of collection and subsequent analysis of data.
- Through the competing theoretical perspectives and methodologies, students are able to understand that social reality is multi-faceted, heterogeneous and dynamic in nature.
- By imparting the knowledge of theory and praxis of research, students are prepared to arrive at a critical understanding of the course. It also equips them with necessary skills for employment in any social research organization.

## 16.2 Discipline Specific Elective Course

### Urban Sociology:

- To appreciate the significance of the city and the process of urbanization and its consequences across the globe, through cross disciplinary texts and ethnographic studies.
- To understand the urban in the historical as well as modern contexts - the idea of urbanism and urban space and the intersections in these of institutions, processes and identities. This is to be achieved by exposing students to critical theoretical debates which help them to gain a deeper understanding of city life and urban environment which can also help them understand their own social environment better.
- To learn about key urban processes such as migration, displacement and urban slums, as well as critical contemporary issues such as resettlement and rehabilitation and also engage in issues of public policy, urban transformation and change. Knowledge of such themes will help students pursue further studies in academic areas such as development and also engage in research on public policy, urban transformation and change.
- To develop critical thinking and a reflective perspective through exposure to multicultural thought; to enhance disciplinary knowledge, research-related skills and develop a problem-solving competence.

### Agrarian Sociology:

- An empathy for and ability to engage agrarian communities as living societies and understand grasp they condition as human condition.
- An appreciation of agrarian world and familiarity with the trajectory of theoretical conversation on agrarian issues and their social, political and policy implications.
- An understating of emerging as well as enduring issues of concern in Indian agrarian scene.
- To be ready for a range of academic and professional roles that may require a knowledge of agrarian societies.

## Environmental Sociology:

- An understanding of dynamic between natural and social worlds from a sociological perspective.
- A grasp of fundamental principles and core theoretical debates of the discipline.
- An ability to contribute from a sociological stand point to any research endeavours or public policy conversations that assess causes, effects and possible solutions of environmental issues and problems.
- To be alive to the questions of ecology and inequity and sensitive to the questions of environmental justice and ethics.

## Sociology of Work:

- Understanding work in its social aspects such as gendered work and unpaid work, as different from its better-known economic dimension.
- Understanding work in its global dimensions, including the mutual relation between work in underdeveloped societies and that in developed ones, thus bringing out the importance of the comparative perspective in the study of work.
- Learning about the complexities, disparities and inequalities in the area of work.
- Learning about the socio-historical context of work, theoretical concerns and problems, and contemporary issues in the area of work and industry.

## Sociology of Health and Medicine:

- To be able to use the key concepts developed in sociology and anthropology to understand biomedical practices of health and illness.
- To critique biomedicine and have an understanding of medicine as a plurality.
- To analyse the everyday experiences of health and illness as produced through social, economic, political and cultural forces.
- To gain insights on issues of public health in India and arrive at independent analysis.

## Indian Sociological Traditions:

- Ensure that students have conceptual clarity and can articulate the main debates and arguments with regard to sociology in India.
- Acquaint the students to the continuities and contradictions in Indian society.
- To ensure that students have understood the formation of the discipline in India and the challenges that it has faced.
- To help students understand the history of ideas related to the analysis of Indian society

## Visual Culture:

- Developing the techniques to understand and appreciate visuals; working with visuals as potential representations of matters of sociological interest.
- Understanding ‘visuality’/’visualization’ as a technique of asserting power and dominance in society.
- Simultaneously locating the subversive potential of alternative or ‘counter-visualities.
- Discovering the strength of ‘visuals’ in an age dominated by techniques of mass production and dissemination of images.

### Reading Ethnographies

- At the end of the course students should be able to identify the expanse of social scientific knowledge and be proficient with the technique and have the patience to read, understand and critically analyse full-length texts that are often about another, unfamiliar culture.
- The course aims to encourage interdisciplinary thinking between sociology, anthropology directly but also with philosophy and literature, through reading of ethnographies. It also seeks to bring the student to a global standard of familiarity with different types of classics within the combined disciplines of sociology, anthropology and ethnology.
- The Course will enable students to not only come to terms with the making of human knowledge but also identifying limits of enquiry by learning and engaging in critical thinking about the research presented in the ethnographies. They are also expected to be able to work with ethnographic description as a unit of knowledge at par with numbers in quantitative studies.
- Doing this Course will help the student discover the strength of small details and to identify what matters to people. They would also be able to engage with the community and understand the significant role of subjective and objective knowledge systems through the exercises in participant observation.

## 16.3 Generic Elective Courses

### GE 01 Indian Society: Images and Realities

- A familiarity with ideas of India in their social and historical context.
- An acquaintance with key institutions and processes of Indian society.
- An ability to understand social institutions with sociological imagination with a critical and comparative spirit. A preliminary understanding of sociological discourse on Indian society.
- A capacity to situate contemporary public issues pertaining to Indian society in the context of these enduring institutions, processes and contentions.

### GE 02 Family and Intimacy

- An ability to examine the institution of family and reality of intimate experiences from a sociological perspective.
- Knowledge of diverse forms of the family within their appropriate historical contexts and comparative appreciation of their features.
- Ability and disposition to constitute quotidian space of family and intimacy as an arena of democracy, gender justice and empowerment.
- Awareness of symbiotic relationship between conceptual, ethnographic and critical literatures in social sciences and demonstrate how they work in close tandem. To alert next generation policy makers to take the questions of the intimate sphere of the family with appropriate seriousness and make them integral to public reason and conversation.

### GE 03 Rethinking Development

- Understand different ideas of, and approaches to, development.
- Explain the dynamics between developmental institutions, actors, policies, theories, approaches, and ideas and the implementation, consequences, and experiences of development.

- Critically analyse the key features of developmental processes in postcolonial India.
- Undertake a sociological examination of developmental practices in different locations, moments, and fields, and to interpret different outcomes and experiences of development

### GE 04 Gender and Violence

- Analyse how the social construction of gender across cultures is fundamental to several experiences of violence.
- Engage with different theoretical perspectives and their critiques in the comprehending- individual, social, cultural, political, or economic experiences of violence.
- Critique the dominant western white feminist theories and articulations of liberation, freedom, emancipation and justice through critically informed ideas and responses from non-western contexts.
- Re-think and re-formulate ideas on various structures of struggles and strategies to counter gendered violence.

### GE 05 Sociology of Social Movements

- At the end of the course, students should be able to distinguish the central principles of different theoretical perspectives in the sociology of social movements and relate them to specific historical and empirical contexts.
- Learn to use sociological theories on social movements to identify a phenomenon as one. Further, students should be able to distinguish a phenomenon as social movement from other cognate political phenomena.
- Understand the dynamics and motivations of individuals and groups participating in social movements and identify reasons for success (or failure) of social movements.
- Discuss and ask questions about social movement theories and methodologies with insight and precision.

### GE 05 The Sociology of Education

- An understanding of the social dimensions of education and its dialectical relationship to the production and reproduction of various social structures, categories and identities. (This includes exposure to the ideas and practices of education which have been critical in the development of modern ideas of childhood, individuality, citizenship and work).
- An exposure to the historical trajectories of educational practices and cultures at various levels in India.
- The ability to make connections between the political economy of global educational regimes and the consequent transformation of institutional structures and practices.
- An appreciation of the importance of cross cultural and historical comparisons as well as micro and macro perspectives in apprehending any aspect of education.
- The course enables students to reflect on their own educational trajectories and analyse its intersections with larger socio-cultural developments.

### GE 07 Sociology of Media

- An appreciation of mediatized character of social existence and its history.
- An acquaintance with history, concepts and various theoretical strands in sociology of media.

- An understanding of social, political, economic that underpin the operations of our mediatized ecosystem and their effects.
- An understanding of cultural processes that underpin the media.

### GE 08 Population and Society

- Demonstrate a knowledge of key concepts in and different approaches to population studies.
- Recognise the relations between population and social groups and processes by linking population size, composition, and growth with fertility, reproduction, and mortality.
- Explain the dynamics between population, gender, and migration in terms of the role of institutions, policies and programmes, and social relations and groups.
- Undertake a sociological analysis of international and national population dynamics and population policies.

## 16.4 Skill Enhancement Courses

### Reading, Writing and Reasoning for Sociology

- At the end of the course, students will be equipped to move from reading rudimentarily to advanced reading of texts extensively.
- Read academic texts and identify the central argument(s) and grasp the content of the texts.
- Read texts to identify the organization of ideas, structure of the arguments, style and tone of the author and author biases.
- Identify general conclusions from specific details in texts.
- Identify standard elements of writing and different genres of writing from personal essay to academic writing.
- Be equipped to express in different genres of writing such as summaries, critical reviews and essays.
- Students should be able to approach writing as a form of reasoning, with specific organization of ideas, style and perspective.
- Be able to develop scientific reasoning by reading texts for consistency and logic.
- By reading texts from cross-cultural contexts, students will be able to approach a creative synthesis in the classroom and grasp the various ways of sociological reasoning.

### Techniques of ethnographic filmmaking

- The SEC on techniques of ethnographic filmmaking starts by laying groundwork for orienting students to the techniques and methods of using the method of visuals in sociology. As students engage with the course along with other important programmes as part of their B.A (H) in sociology, they also begin to understand the intersection of classroom-based knowledge and practical realm. At this point, the course aims to prepare them for challenges of doing sociological fieldwork and observing real-world spheres through the mode of filmmaking. It enables them to build on the graduate attributes of disciplinary knowledge, critical thinking, research-related skills, scientific reasoning, reflective thinking and multicultural competence.
- Film screenings, assignments and projects in this course are aimed at broadening the spectrum of engagement through sociology. Through ethnographic filmmaking, students move beyond the textual reading and writing mode. Centered on the means

of visual, oral and aural, the programme helps them build on the use of diverse media (and tools) to represent cultures and narratives.

- A key learning outcome of the course is to introduce students to the skills and sensitivity needed to engage with the social world. Through ethnographic fieldwork and filmmaking, as they grasp the knowledge of technology, the meaning-making of society remains crucial in the SEC programme. An understanding of diversity of gender, culture, class, caste, sexuality, and religion is fundamentally reflected as they produce films on multiple issues.
- An important aspect of the programme is working in teams/groups for the final filmmaking projects. Through teamwork and extensive discussions, students encounter and learn the importance of decision-making, ethics, communication skills, and planning. These are core competencies that the SEC orients them about.
- The experience of producing visual anthropological content as part of the SEC helps students gear up for the specific electives and courses they take up in the later semesters, particular the research methods course. The brush with social research skills, techniques of sociological fieldwork and thematic issues of representation helps in enriching their engagement with the theoretical framework in the final year of BA (H) Sociology.

## 17. B. Sc (H) PHYSICS

### 17.1 Core Courses

#### CC-I: Mathematical Physics-I

- Revise the knowledge of calculus, vectors, vector calculus, probability and probability distributions. These basic mathematical structures are essential in solving problems in various branches of Physics as well as in engineering.
- Draw and interpret graphs of various functions. Solve first order differential equations and apply it to physics problems solve linear second order homogeneous and non-homogeneous differential equations with constant coefficients.
- Calculate partial derivatives of function of several variables Understand the concept of gradient of scalar field and divergence and curl of vector fields.
- Perform line, surface and volume integration and apply Green's, Stokes' and Gauss's Theorems to compute these integrals.
- Apply curvilinear coordinates to problems with spherical and cylindrical symmetries.
- Understand elementary probability theory and the properties of discrete and continuous distribution functions.
- In the laboratory course, learn the fundamentals of the C and C++ programming languages. Also, understanding Monte Carlo techniques, fitting a given data to linear function using method of least squares, approximation of a function by Maclaurin and Taylor’s series, finding roots of a given equation and their applications in solving simple physical problems.

#### CC-II: Mechanics

- Understand laws of motion and their application to various dynamical situations.
- Learn the concept of Inertial reference frames and Galilean transformations. Also, the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.

- Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analysing rolling with slipping.
- Understand variable mass system and dynamics of a system of particles. Able to write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions.
- Understand the phenomena of collisions and ideas about centre of mass and laboratory frames and their correlation.
- Understand conservative and non-conservative forces and also Potential Energy diagrams.
- Understand angular momentum of a system of particles. Apply Kepler's law to describe the motion of planets and satellites in circular orbit, through the study of the law of Gravitation.
- Understand concept of Geosynchronous orbits Explain the phenomenon of simple harmonic motion. Also, quality factor of forced oscillations.
- Understand the concept of Centrifugal force and Coriolis forces.
- Understand special theory of relativity - special relativistic effects and their effects on the mass and energy of a moving object. In the laboratory course, the student shall perform experiments related to mechanics (compound pendulum), rotational dynamics (Flywheel), elastic properties (Young Modulus and Modulus of Rigidity), fluid dynamics, estimation of random errors in the observations etc.

### CC-III: Electricity and Magnetism

- Demonstrate the application of Coulomb's law for the electric field, and also apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- Demonstrate an understanding of the relation between electric field and potential, exploit the potential to solve a variety of problems, and relate it to the potential energy of a charge distribution.
- Exploit alternative coordinate systems (cylindrical and spherical coordinates) to solve problems.
- Apply Gauss's law of electrostatics to solve a variety of problems.
- Demonstrate an understanding of electric dipoles and the role of molecular dipoles in the electrostatic response of dielectrics.
- Demonstrate an understanding of the behaviour of electric conductors.
- Demonstrate a working understanding of capacitors.
- Calculate the magnetic forces that act on moving charges and the magnetic fields due to currents (Biot- Savart and Ampere laws).
- Understand the concepts of induction and self-induction, to solve problems using Faraday's and Lenz's laws.
- Apply Kirchhoff's rules to analyse AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.
- Deal with electromagnetic oscillations, AC currents and oscillation circuits and analyse and solve LCR circuits.
- Understand the basics of electrical circuits and analyse circuits using Network Theorems such as Superposition, Thevenin, Norton, Reciprocity, Maximum Power Transfer, etc.
- In the laboratory course the student will get an opportunity to verify network theorems and study different circuits such as RC circuit, LCR circuit. Different methods to measure low and high resistance, capacitance, self-inductance, mutual inductance and also strength of a magnetic field and its variation (dB/dX)

## CC-IV: Waves and Optics

- Understand Simple harmonic oscillation and superposition principle.
- Understand superposition of a range of collinear and mutually perpendicular simple harmonic motions and their applications.
- Understand the importance of classical wave equation in transverse and longitudinal waves and solving a range of physical systems on its basis.
- Understand different types of waves and their velocities: Plane, Spherical, Transverse, Longitudinal.
- Understand Concept of normal modes in transverse and longitudinal waves: their frequencies and configurations.
- Understand the concept of temporal and spatial coherence.
- Understand Interference as superposition of waves from coherent sources derived from same parent source.
- Demonstrate understanding of Interference experiments: Young's Double Slit, Fresnel's biprism, Llyod's Mirror, Newton's Rings, Michelson Interferometer and Fabry-Perot Interferometer.
- Demonstrate basic concepts of Diffraction: Superposition of wavelets diffracted from Apertures.
- Understand Fraunhofer Diffraction from apertures: Rectangular, Slit, Double Slit, Grating, Circular apertures.
- Demonstrate fundamental understanding of Fresnel Diffraction: Half period zones, Zone Plate, Fresnel's Integrals, Cornu's Spiral and its applications.
- In the laboratory course, students will gain hands-on experience of using various optical instruments and making finer measurements of wavelength of light using Newton Rings experiment, Fresnel Biprism etc. Resolving power of optical equipment can be learnt first-hand.
- The motion of coupled oscillators, study of Lissajous figures and behaviour of transverse, longitudinal waves can be learnt in this laboratory course.

## CC-V: Mathematical Physics-II

- Represent a periodic function by a sum of harmonics using Fourier series and their applications in physical problems such as vibrating strings etc.
- Expand an odd or even function as half range sine and cosine Fourier series.
- Obtain power series solution of differential equation of second order with variable coefficient using Frobenius method.
  Understand properties and applications of special functions like Legendre polynomials, Bessel functions and their differential equations and their applications in various physical problems such as in quantum mechanics.

## CC-VI: Thermal Physics

- Comprehend the basic concepts of thermodynamics, the first and the second law of thermodynamics.
- Understand the concept of entropy and the associated theorems, the thermodynamic potentials and their physical interpretations.
- Know about reversible and Irreversible processes.
- Learn about Maxwell's relations and use them for solving many problems in Thermodynamics.
- Understand the concept and behavior of ideal and real gases.

## CC-VII: Digital Systems and Applications

- Course learning begins with the basic understanding of active and passive components.
- It then builds Concept of Integrated Chips (IC): its classification and uses.
- Differentiating with the Analog and Digital circuits, the concepts of number systems like Binary.
- BCD, Octal and hexadecimal are developed to elaborate and focus on the digital systems.
- Explains the concepts of logic states and logic gates AND, OR, NOT, NAND, NOR, XOR and XNOR as fundamental, universal and derived gates with its utility.

## CC-VIII: Mathematical Physics III

- Determine continuity, differentiability and analyticity of a complex function and find the derivative of a function.
- Understand properties of elementary complex functions (polynomials, reciprocals, exponential, trigonometric, hyperbolic, etc) of a single complex variable.
- Work with multi-valued functions (logarithmic, complex power, inverse trigonometric function) and determine branches of these functions.
- Evaluate a contour integral using parameterization, fundamental theorem of calculus and Cauchy's integral formula.
- Find the Taylor series of a function and determine its radius of convergence;

## CC-IX: Elements of Modern Physics

- Quantum measurements and the theory of wave packets and uncertainty principle.
- The central concepts of quantum mechanics: wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases, probability density and the normalisation techniques, skill development on problem solving e.g. one dimensional rigid box, tunnelling through potential barrier, step potential, rectangular barrier.
- The properties of nuclei like density, size, binding energy, nuclear forces and structure of atomic nucleus, liquid drop model and nuclear shell model and mass formula.
- Decay rates and lifetime of radioactive decays like alpha, beta, gamma decay. Neutrino, its properties and its role in the theory of beta decay.
- Fission and fusion as well as nuclear processes to produce nuclear energy in nuclear reactor and stellar energy in stars.

## CC-X: Analog Systems and Applications

- To have knowledge about characteristics of semiconductor materials in terms of band structure, movement of charge carriers and to explain properties of n and p type semiconductors.
- To know the basic concepts of PN junction diode, its fabrication, conduction mechanism and determine its barrier potential and width.
- To learn structure and operation of simple PN junction devices such as LED, photo diodes, Solar cells, Zener diodes etc.
- To apply the basics of diodes to describe working of rectifier circuits and quantitatively explain effect of capacitance filter, line and load regulation.
- NPN and PNP transistors and basic configurations namely common base, common emitter and common collector, and also about current and voltage gain.

## CC-XI: Quantum Mechanics Applications

- Familiarisation with quantum mechanics formulation.
- After an exposition of inadequacies of classical mechanics in explaining microscopic phenomena, quantum theory formulation is introduced through the Schrodinger equation.
- The interpretation of wave function of a quantum particle and probabilistic nature of its location and subtler points of quantum phenomena are exposed to the student.
- Methods to solve time-dependent and time-independent Schrodinger equation.
- Through understanding the behaviour of quantum particles encountering a barrier potential, the student gets exposed to solving non-relativistic hydrogen atoms, for its spectrum and eigenfunctions.

## CC-XII: Solid State Physics

- Elucidate the concept of lattice, crystals and symmetry operations.
- Explain the concepts such as the reciprocal lattice and the Brillouin zone and the dynamics of atoms and electrons in solids.
- Explain diffraction of X-rays by solids to determine the crystal structure.
- Understand the elementary lattice dynamics and its influence on the properties of materials.
- Understand lattice vibrations, phonons and in depth Einstein and Debye theory of specific heat of solids.
- Describe the main features of the physics of electrons in solids.

## CC-XIII: Electromagnetic Theory

- Concept of Maxwell Equations, role of displacement current, gauge transformations, scalar and vector potentials, Coulomb and Lorentz gauge, boundary conditions at the interface between different media.
- Apply Maxwell's equations to deduce wave equation, electromagnetic field energy, momentum and angular momentum density.
- Understanding of Poynting Theorem and pointing vector.
- Electromagnetic wave propagation in unbounded media: Vacuum, dielectric medium, conducting medium, plasma.
  Electromagnetic wave propagation in bounded media.

## CC-XIV: Statistical Mechanics

- Understand the concepts of microstate, macrostate, ensemble, phase space, thermodynamic probability and partition function.
- Understand the use of Thermodynamic probability and Partition function for calculation of thermodynamic variables. Difference between the classical and quantum statistics.
- Understand the combinatorial studies of particles with their distinguishably or indistinguishably nature and conditions which lead to the three different distribution laws e.g. Maxwell-Boltzmann distribution, Bose-Einstein distribution and Fermi-Dirac distribution laws of particles and their derivation.

- Comprehend and articulate the connection as well as dichotomy between classical statistical mechanics and quantum statistical mechanics.
- Learn to apply the classical statistical mechanics to derive the law of equipartition of energy and specific heat.

## 17.2 Discipline Specific Elective Courses

### Experimental Techniques

- Learn the measurement systems, errors in measurements and statistical treatment of data.
- About Noise and signal, signal to noise ratio, different types of noises and their identification.
- Concept of electromagnetic interference and necessity of grounding.
- Understand principle of working and industrial applications of various transducers like Electrical, Thermal and Mechanical systems commonly used to measure Temperature and Position in industry.
- Develop an understanding of construction and working of different measuring instruments.
- Develop an understanding of construction, working and use of different AC and DC bridges and its applications.

### Advanced Mathematical Physics - I

- Demonstration of Algebraic Structures in n-dimension. Application of Vector Spaces & Matrices in the quantum world.
- Learn the basic properties of the linear vector space such as linear dependence and independence of vectors, change of basis, isomorphism and homomorphism, linear transformations and their representation by matrices.
- Learn the basic properties of matrices, different types of matrices viz Hermitian, skew Hermitian, orthogonal and unitary matrices and their correspondence to physical quantities, e . g , operators in quantum mechanics. They should also learn how to find the eigenvalues and eigenvectors of matrices.
- Learn some basic properties tensors, their symmetric and antisymmetric nature, the Cartesian tensors, the general tensors, contravariant, covariant and mixed tensors and their transformation properties under coordinate transformations, physical examples of tensors such as moment of inertia tensor, energy momentum tensor, stress tensor, strain tensor etc.

### Nuclear and Particle Physics

- To be able to understand the basic properties of nuclei as well as knowledge of experimental determination of the same, the concept of binding energy, its various dependent parameters, N-Z curves and their significance.
- To appreciate the formulations and contrasts between different nuclear models such as Liquid drop model, Fermi gas model and Shell Model and evidence in support.
- Knowledge of radioactivity and decay laws. A detailed analysis, comparison and energy kinematics of alpha, beta and gamma decays.

- Familiarisation with different types of nuclear reactions, Q- values, compound and direct reactions.
- To know about energy losses due to ionising radiations, energy losses of electrons, gamma ray interactions through matter and neutron interaction with matter. Through the section on accelerators students will acquire knowledge about Accelerator facilities in India along with a comparative study of a range of detectors and accelerators which are building blocks of modern-day science.

### Physics of Devices and Communication

- Students will develop the basic knowledge of semiconductor device physics and electronic circuits along with the practical technological considerations and applications.
- They will be able to understand the operation of devices such as UJT, JFET, MOS, various bias circuits of MOSFET, Charge coupled Devices and Tunnel Diode.
- Students will learn to analyse MOSFET circuits and develop an understanding of MOSFET I-V characteristics and the allowed frequency limits.
- Another objective of this paper is to introduce students with the IC fabrication technology involving the process of diffusion, implantation, oxidation and etching with an emphasis on photolithography and electron-lithography.

### Astronomy and Astrophysics

- Significance of astronomical scales, basic concepts of positional astronomy like astronomical coordinate systems, transformations between different astronomical coordinate systems.
- Basic parameters of stars like brightness, radiant flux, luminosity, magnitude, spectral classification. H-R diagram.
- About various types of telescopes and telescope mountings.
- Understand the physics of the Sun, including solar MHD, Alfven's theorem, chromosphere, corona, and solar activity.
- Understand the physics of stars, hydrostatic equilibrium, temperature gradient, stellar energy sources

### Atmospheric Physics

- Good knowledge of Earth's atmosphere, its composition, effective temperature, Greenhouse effect. Hydrostatic equation and atmospheric thermodynamics. Local winds, clouds, fog, monsoon, cyclones, sea breeze and land breeze and thunderstorms etc.
- Essential knowledge of the instruments of meteorological observation, meteorological processes and systems.
- Understanding atmospheric dynamics, fundamental forces, conservation laws, rotating coordinate system and equations of motion. Circulation, vorticity, various types of circulations, atmospheric oscillations: biannual, annual and semi-annual oscillations.
- Understanding atmospheric waves. Surface water waves, acoustic waves, buoyancy waves, atmospheric gravity waves (AGW) and its propagation in non-homogeneous medium, Lamb and Rossy waves and their propagation in 3-dimension. Wave absorption and non linear effects.

## Biological Physics

- Know basic facts about biological systems, including single cells, multicellular organisms and ecosystems from a quantitative perspective.
- Gain familiarity with various biological processes at different length and time scales, including molecular processes, organism level processes and evolution.
- Be able to apply the principles of physics from areas such as mechanics, electricity and magnetism, thermodynamics, statistical mechanics, and dynamical systems to understand certain living processes.
- Gain a systems level perspective on organisms and appreciate how networks of interactions of many components give rise to complex behaviour.
- Perform mathematical and computational modelling of certain aspects of living Systems.

## Embedded systems - Introduction to Microcontroller

- Knowledge of the major components that constitute an embedded system.
- Understand what is a microcontroller, microcomputer embedded system.
- Description of the architecture of a 8051 microcontroller.
- Write simple programs for 8051 microcontrollers in C language.
- Understand key concepts of 8051 microcontroller systems like I/O operations, interrupts, programming of timers and counters. Interfacing of 8051 microcontroller with peripherals.
- Understand and explain concepts and architecture of embedded systems

## Linear Algebra and Tensor Analysis

- Demonstration of Algebraic Structures in n-dimension. Application of Vector Spaces & Matrices in the quantum world.
- Learn the basic properties of the linear vector space such as linear dependence and independence of vectors, change of basis, isomorphism and homomorphism, linear transformations and their representation by matrices.
- Learn the basic properties of matrices, different types of matrices viz Hermitian, skew Hermitian, orthogonal and unitary matrices and their correspondence to physical quantities, e.g , operators in quantum mechanics. They should also learn how to find the eigenvalues and eigenvectors of matrices.
- Learn some basic properties tensors, their symmetric and antisymmetric nature, the Cartesian tensors, the general tensors, contravariant, covariant and mixed tensors and transformation properties under coordinate transformations, physical examples of tensors such as moment of inertia tensor, energy momentum tensor, stress tensor, strain tensor etc.

## Nano Materials and Applications

- Explain the difference between nanomaterials and bulk materials and their properties.
- Explain various methods for the synthesis/growth of nanomaterials including top down and bottom-up approaches.
- Explain the role of confinement on the density of state function and so on the various properties exhibited by nanomaterials compared to bulk materials.
- Explain the various characterization tools required to study the structural, optical and electrical properties of nanomaterials.

- Analyse the data obtained from the various characterization techniques: X-ray diffraction, electron microscopy, Atomic Force Microscopy and Scanning Tunnelling Microscopy.
- Explain the concept of Quasi-particles such as excitons and how they influence the optical properties.

### Communication System

- This paper aims to describe the concepts of electronics in communication. In this course, students will receive an introduction to the principle, performance and applications of communication systems.
- Students will learn the various means and modes of communication. They will gain an understanding of the fundamentals of the electronic communication system and electromagnetic communication spectrum with an idea of frequency allocation for radio communication systems in India.
- They will gain an insight on the use of different modulation and demodulation techniques used in analog communication.
- Students will be able to analyse different parameters of analog communication techniques.
- They will learn the need of sampling and different sampling techniques where they can sample analog signals

### Medical Physics.

- Focus on the application of Physics to clinical medicine.
- Gain a broad and fundamental understanding of Physics while developing particular expertise in medical applications.
- Learn about the human body, its anatomy, physiology and BioPhysics, exploring its performance as a physical machine.
- Learn diagnostic and therapeutic applications like the ECG, Radiation Physics, X- ray technology, ultrasound and magnetic resonance imaging.
- Gain knowledge with reference to working of various diagnostic tools, medical imaging techniques

### Applied Dynamics

- Demonstrate understanding of the concepts that underlay the study of dynamical systems. Use the analytical and computational methods covered in this course to analyse dynamical systems models.
- Understand fractals as self-similar structures by giving examples from nature and developing mathematical models for simple fractal structures.
- Understand various forms of dynamics and different routes to chaos. Analyse the behaviour of dynamical systems (e.g. find periodic orbits and assess their stability, draw phase portraits, etc.).
- Understand basic Physics of fluids and its dynamics theoretically and experimentally and by computational simulations: Basic properties of fluids including viscosity, thermal conductivity, mass diffusivity, equation of state. Also, Physics of different types of fluid flow phenomena as well as fluid flow visualisations like streamlines, path lines and streak line flows.

## Digital Signal Processing

- The student will be in a position to understand the use of different transforms and analyse the discrete time signals and systems. They will learn to analyse a digital system using z- transforms and discrete time Fourier transforms, regions of convergence concepts, their properties and perform simple transform calculations.
- The student will realise the use of LTI filters for filtering different real world signals.
- The concept of transfer Function and difference-Equation System will be introduced. Also, they will learn to solve Difference Equations.
- Students will develop an ability to analyse DSP systems like linear-phase, FIR, IIR, All-pass, averaging and notch Filter etc
- Students will be able to understand the discrete Fourier transform (DFT) and realise its implementation using FFT techniques.
- Students will be able to learn the realisation of digital filters, their structures, along with their advantages and disadvantages. They will be able to design and understand different types of digital filters such as finite & infinite impulse response filters for various applications.

## Physics of Earth

- At the end of this course students will be able to Have an overview of the structure of the earth as well as various dynamical processes occurring on it.
- Develop an understanding of the evolution of the earth.
- Apply physical principles of elasticity and elastic wave propagation to understand modern global seismology as a probe of the Earth's internal structure.
- Understand the origin of magnetic field, Geodynamics of earthquakes and the description of seismic sources; a simple but fundamental theory of thermal convection; the distinctive rheological behaviour of the upper mantle and its top.
- Explore various roles played by water cycle, carbon cycle, nitrogen cycles in maintaining steady state of earth leading to better understanding of the contemporary dilemmas (climate change, biodiversity loss, population growth, etc.) disturbing the Earth

## Advanced Mathematical Physics-II

- Understand variational principle and apply it to calculate: (i) Geodesics in two and three dimensions (ii) Euler Lagrange Equation and apply it simple problems in one and two dimensions.
- Acquire basic concept of Hamiltonian, Hamilton’s principle and Hamiltonian equation of motion, Poisson and Lagrange brackets.
- Learn elementary group theory, i.e., definition and properties of groups, subgroups, Homomorphism, isomorphism, normal and conjugate groups, representation of groups, Reducible and Irreducible groups.
- Learn the theory of probability, Random variables and probability distributions, Expectation values and variance. Various examples of probability distributions used in physics. The principle of least squares.

## Classical Dynamics

- Understand the physical principle behind the derivation of Lagrange and Hamilton equations, and the advantages of these formulations.
- Translate physical problems into appropriate mathematical language and apply appropriate mathematical tools – particularly, calculus, differential equations, linear algebra, and the calculus of variations – to analyse and solve the resulting equations.

- Apply Lagrangian & Hamiltonian methods to complex motion problems.
- One will be able to relate symmetries to conservation laws in physical systems, and apply these concepts to practical situations.
- Understand the intricacies of motion of particles in the central force field. Critical thinking and problem-solving skills.
- Review the retarded potentials, potentials due to a moving charge, Lienard Wiechert potentials, electric and magnetic fields due to a moving charge, power radiated, Larmor's formula and its relativistic generalization.

### Dissertation

- Exposure to research methodology.
- Picking up skills relevant to a dissertation project, such as experimental skills in the subject, computational skills, etc.
- Development of creative ability and intellectual initiative.
- Developing the ability for scientific writing.
- Becoming conversant with ethical practices in acknowledging other sources, avoiding plagiarism, etc.

### Verilog and FPGA based system design

- Understand the steps and processes for design of logic circuits and systems.
- Be able to differentiate between combinational and sequential circuits.
- Be able to design various types of state machines.
- Be able to partition a complex logic system into elements of data-path and control path.
- Understand various types of programmable logic building blocks such as CPLDs and FPGAs and their trade-offs.
- Be able to write synthesizable Verilog code.
- Be able to write a Verilog test bench to test various Verilog code modules.
- Be able to design, program and test logic systems on a programmable logic device (CPLD or FPGA) using Verilog.

### Advanced Quantum Mechanics

- The world is marching towards attainment of quantum computers, which in turn is likely to revolutionize the field of Artificial Intelligence (AI).
- After learning this course properly, our students would be adequately prepared to participate and innovate in the coming AI revolution.
- As this course starts with an introduction to linear vector spaces and inner product of two vectors that results in a complex number, aided by problem solving exercises, students will imbibe a critical understanding of the general mathematical structures of complex analysis, vector spaces, basis and orthogonality, which form the underlying principles of diverse topics like Fourier transform, matrices and their diagonalisation, Laurent series and calculus of residues, etc. which in turn constitute the bedrock of signal processing, Wiener-Khinchin theorem, Match filtering, etc. that are extremely useful in communication, radar techniques, detection of weak signals, gravitational wave data analysis, operation research, etc.
- Intense problem-solving sessions will enable the students to develop analytical and mathematical imagination that are necessary to be creative in physical sciences as well as engineering research areas.

## 17.3 Generic Elective Courses

### Electricity and Magnetism

- Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.
- Apply Gauss's law of electrostatics to solve a variety of problems.
- Articulate knowledge of electric current, resistance and capacitance in terms of electric field and electric potential.

### Mathematical Physics

- Learn to plot and interpret graph of the functions using the concepts of calculus.
- Be able to solve first order differential equations and apply it to physical problems.
- Have ability to solve linear second order homogeneous and non-homogeneous differential equations with constant coefficient
- Understand Vector Algebra: scalar and vector product, scalar triple product and their physical significance.

### Digital, Analog and Instrumentation

- To differentiate between Analog and Digital circuits, acquire knowledge of the concepts of binary numbers, their addition, subtraction and conversion into decimal Numbers.
- To explain the concepts of logic states and logic gates AND, OR, NOT, NAND, NOR, XOR and XNOR as fundamental, universal and derived gates with its utility.
- To learn how to write logical Boolean statements using the truth table, its simplification using Boolean Algebra, De-Morgan's Theorem and Karnaugh Maps, especially the Sum of Products method and realise the corresponding logic circuit.
- To realise addition and subtraction of binary numbers using electronic circuits.

### Applied Dynamics

- Demonstrate understanding of the concepts that underlay the study of dynamical systems. Use the analytical and computational methods covered in this course to analyse dynamical systems models.
- Understand fractals as self-similar structures by giving examples from nature and develop mathematical models for simple fractal structures.
- Understand various forms of dynamics and different routes to chaos.
- Analyse the behaviour of dynamical systems (e.g. find periodic orbits and assess their stability, draw phase portraits, etc.).

### Medical Physics

- Focus on the application of Physics to clinical medicine.
- Gain a broad and fundamental understanding of Physics while developing particular expertise in medical applications.
- Learn about the human body, its anatomy, physiology and BioPhysics, exploring its performance as a physical machine.

- Learn diagnostic and therapeutic applications like the ECG, Radiation Physics, X-ray technology, ultrasound and magnetic resonance imaging.

## Mechanics

- Understand the role of vectors and coordinate systems in Physics.
- Learn to solve Ordinary Differential Equations: First order, Second order Differential Equations with constant coefficients.
- Understand laws of motion and their application to various dynamical situations.
- Learn the concept of Inertial reference frames and Galilean transformations. Also, the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.

## Elements of Modern Physics

- Main aspects of the inadequacies of classical mechanics and understand historical development of quantum mechanics and ability to discuss and interpret experiments that reveal the dual nature of matter.
- The theory of quantum measurements, wave packets and uncertainty principle.
- The central concepts of quantum mechanics: wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases, probability density and the normalization techniques, skill development on problem solving e.g. one dimensional rigid box, tunnelling through potential barrier, step potential, rectangular barrier.
- The properties of nuclei like density, size, binding energy, nuclear forces and structureof atomic nucleus, liquid drop model and nuclear shell model and mass formula.

## Solid State Physics

- Elucidate the concept of lattice, crystals and symmetry operations.
- Explain the concepts such as the reciprocal lattice and the Brillouin zone and the dynamics of atoms and electrons in solids.
- Explain diffraction of X-rays by solids to determine the crystal structure.
- Understand the elementary lattice dynamics and its influence on the properties of materials.

## Embedded System: Introduction to Microcontroller

- Knowledge of the major components that constitute an embedded system.
  Understand what is a microcontroller, microcomputer embedded system.
  Description of the architecture of a 8051 microcontroller.
  Write simple programs for 8051 microcontrollers in C language.

## Biological Physics

- Know basic facts about biological systems, including single cells, multicellular organisms and ecosystems from a quantitative perspective.
- Gain familiarity with various biological processes at different length and time scales, including molecular processes, organism level processes and evolution.

- Be able to apply the principles of physics from areas such as mechanics, electricity and magnetism, thermodynamics, statistical mechanics, and dynamical systems to understand certain living processes.
- Gain a systems level perspective on organisms and appreciate how networks of interactions of many components give rise to complex behavior.

### Waves and Optics

- Understand Simple harmonic oscillation and superposition principle.
- Understand superposition of a range of collinear and mutually perpendicular simple harmonic motions and their applications.
- Understand the importance of classical wave equation in transverse and longitudinal waves and solving a range of physical systems on its basis.
- Understand different types of waves and their velocities: Plane, Spherical, Transverse, Longitudinal.

### Quantum Mechanics

- Familiarization with quantum mechanics formulation.
- After an exposition of inadequacies of classical mechanics in explaining microscopic phenomena, quantum theory formulation is introduced through Schrodinger equation.
- The interpretation of wave function of quantum particle and probabilistic nature of its location and subtler points of quantum phenomena are exposed to the student.
- Methods to solve time-dependent and time-independent Schrodinger equation

### Communication System

- This paper aims to describe the concepts of electronics in communication. In this course, students will receive an introduction to the principle, performance and applications of communication systems.
- Students will learn the various means and modes of communication. They will gain an understanding of fundamentals of the electronic communication system and electromagnetic communication spectrum with an idea of frequency allocation for radio communication system in India.
- They will gain an insight on the use of different modulation and demodulation techniques used in analog communication
- Students will be able to analyse different parameters of analog communication techniques.

### Verilog and FPGA based system design

- Understand the steps and processes for design of logic circuits and systems.
- Be able to differentiate between combinational and sequential circuits.
- Be able to design various types of state machines.
- Be able to partition a complex logic system into elements of data-path and control path.

### Nano Materials and Applications

- Explain the difference between nanomaterials and bulk materials and their properties.
- Explain various methods for the synthesis/growth of nanomaterials.
- Explain the role of confinement on the density of state function and so on the various properties exhibited by nanomaterials compared to bulk materials.

Explain the various characterization tools required to study the structural, optical and electrical properties of nanomaterials.

## Thermal Physics and Statistical Mechanics

- Learn the basic concepts of thermodynamics, the first and the second law of thermodynamics, the concept of entropy and the associated theorems, the thermodynamic potentials and their physical interpretations. They are also expected to learn Maxwell's thermodynamic relations.
- Know the fundamentals of the kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions, viscosity, thermal conductivity, diffusion and Brownian motion.
- Learn about the black body radiations, Stefan- Boltzmann's law, Rayleigh-Jeans law and Planck's law and their significances.
- Learn the quantum statistical distributions, viz., the Bose-Einstein statistics and the Fermi-Dirac statistics.

## Digital Signal Processing

- Students will learn basic discrete-time signal and system types, convolution sum, impulse and frequency response concepts for linear time-invariant (LTI) systems.
- The student will be in position to understand use of different transforms and analyse the discrete time signals and systems. They will learn to analyze a digital system using z-transforms and discrete time Fourier transforms, region of convergence concepts, their properties and perform simple transform calculations.
- The student will realize the use of LTI filters for filtering different real-world signals. The concept of transfer function and difference-Equation System will be introduced. Also, they will learn to solve Difference Equations.
  Students will develop an ability to analyse DSP systems like linear-phase, FIR, IIR, All-pass, averaging and notch Filter etc.

## Nuclear and Particle Physics

- The acquire knowledge can be applied in the areas of nuclear, medical, archaeology, geology and other interdisciplinary fields of Physics and Chemistry. It will enhance the special skills required for these fields.
  Learn the ground state properties of a nucleus – the constituents and their properties, mass number and atomic number, relation between the mass number and the radius and the mass number, average density, range of force, saturation property, stability curve, the concepts of packing fraction and binding energy, binding energy per nucleon vs. mass number graph, explanation of fusion and fission from the nature of the binding energy graph.
- To be able to understand the basic properties of nuclei as well as knowledge of experimental assessments, the concept of binding energy and n-z curves and their significance.
- Know about the nuclear models and their roles in explaining the ground state properties of the nucleus –(i) the liquid drop model, its justification so far as the nuclear properties are concerned, the semi-empirical mass formula, (ii) the shell model, evidence of shell structure, magic numbers, predictions of ground state spin and parity, theoretical deduction of the shell structure, consistency of the s hell structure with the Pauli exclusion principles.

### Astronomy and Astrophysics

- An understanding of different types of telescopes, diurnal and yearly motion of astronomical objects, and astronomical coordinate systems and their transformations.
- Brightness scale for stars, types of stars, their structure and evolution on HR diagram.
- Components of Solar System and its evolution.
- The large-scale structure of the Universe and its history

### Atmospheric Physics

- Good knowledge of Earth's atmosphere, its composition, effective temperature, Greenhouse effect. Hydrostatic equation and atmospheric thermodynamics. Local winds, clouds, fog, monsoon, cyclones, sea breeze and land breeze and thunderstorms etc.
- Essential knowledge of the instruments of meteorological observation, meteorological processes and systems.
- Understanding atmospheric dynamics, fundamental forces, conservation laws, rotating coordinate system and equations of motion. Circulation, vorticity, various types of circulations, atmospheric oscillations: biannual, annual and semi-annual oscillations.
- Understanding atmospheric waves. Surface water waves, accoustic waves, buoyancy waves, atmospheric gravity waves (AGW) and its propagation in non-homogeneous medium, Lamb and Rossy waves and their propagation in 3-dimension. Wave absorption and nonlinear effects.

### Physics of Earth

- Have an overview of the structure of the earth as well as various dynamical processes occurring on it.
- Develop an understanding of the evolution of the earth.
- Apply physical principles of elasticity and elastic wave propagation to understand modern global seismology as a probe of the Earth's internal structure.
- Understand the origin of magnetic field, Geodynamics of earthquakes and the description of seismic sources; a simple but fundamental theory of thermal convection; the distinctive rheological behaviour of the upper mantle and its top.

## 17.4 Skill-Enhancement Elective Courses

### Physics Workshop Skills

- Learning measuring devices like Vernier callipers, Screw gauge, travelling microscope and Sextant for measuring various length scales.
- Acquire skills in the usage of multi-meters, soldering iron, oscilloscopes, power supplies and relays.
- Developing mechanical skill such as casting, foundry, machining, forming and welding and will become familiar with common machine tools like lathe, shaper, drilling, milling, surface machines and Cutting tools.
- Getting acquaintance with prime movers: Mechanism, gear system, wheel, Fixing of gears with motor axle. Lever mechanism. Lifting heavy weights using a lever. Braking systems, pulleys.

## Computational Physics Skills

- Learn the importance of computers in solving problems in Physics.
- Learn to write the algorithm for solving a problem by drawing the flowchart of simple problems like roots of quadratic equations etc.
- Have a working knowledge about the Linux system: the necessary commands.
- Learn to write and execute FORTRAN programs in the Linux system. They should attempt the simple numerical exercises: product of matrices, sum of finite series and area under a curve, plotting trajectory of a projectile, find roots of a quadratic equation, numerical solution of equation of motion of simple harmonic oscillator and plot the outputs for visualization etc.
- Learn to use GUI windows, Linux commands, familiarity with DOS commands and working in an editor to write sources codes in FORTRAN.
- The students should also learn "Scientific Word Processing", particularly, how to use the LaTeX software in writing articles and papers which include Mathematica equations and diagrams.
- The students should learn the basics of Gnuplot. He should be able to create an input Gnuplot file for plotting data and saving the output for seeing on the screen, saving it as an eps file and as a pdf file etc.

## Electrical circuits and Network Skills

- They would be able to demonstrate good comprehension of basic principles of electricity including ideas about voltage, current and resistance.
- They would also be proficient in identifying different combinations of circuit elements besides having sound knowledge about varying types of voltage & current - alternating and direct.
- Their familiarisation with basic tenets of electrical circuits like measurement of resistance, current and voltages in different circuits would be complete.
- They would be able to analyse complicated AC and DC electrical circuits.

## Basic Instrumentation Skills

- The student is expected to have the necessary working knowledge on accuracy, precision, resolution, range and errors/uncertainty in measurements.
- Course learning begins with the basic understanding of the measurement and errors in measurement. It then familiarises each and every specification of a multi-meter, multi-meters, multivibrators, rectifiers, amplifiers, oscillators and high voltage probes and their significance with hands on mode.
- Explanation of the Specifications of CRO and their significance. Complete explanation of CRT.
- Students learn the use of CRO for the measurement of voltage (dc and ac), frequency and time period. Covers the Digital storage Oscilloscope and its principle of working.

## Renewable Energy and Energy harvesting

- Significance of renewable energy and details concerning various sources of energy will be imparted to the students. The students are expected to learn not only the theories of the renewable sources of energy, but also to have hands-on experiences on them wherever possible.\
- Some of the renewable sources of energy which should be studied here are: (i) off-shore wind energy, (ii) tidal energy, (iii) solar energy, (iv) biogas energy and (v) hydroelectricity.

- Knowledge of various sources of energy for harvesting will be given.
- Understand the need of energy conversion and the various methods of energy storage.

### Engineering Design and Prototyping/Technical

- Understanding the concept of a sectional view – visualising a space after being cut by a plane. How The student will be able to draw and learn proper techniques for drawing an aligned section.
- Understanding the use of spatial visualisation by constructing an orthographic multi-view drawing.
- Drawing simple curves like ellipse, cycloid and spiral, Orthographic projections of points, lines and of solids like cylinders, cones, prisms and pyramids etc.
- Exposure to Computer Aided Design (CAD) and Auto CAD techniques and hence will make the student technologically savvy.

### Radiation Safety

- Awareness and understanding the hazards of radiation and the safety measures to guard against these hazards.
- Learning the basic aspects of the atomic and nuclear Physics, especially the radiations that originate from the atom and the nucleus.
- Having comprehensive knowledge about the nature of interaction of matter with radiations like gamma, beta, alpha rays, neutrons etc. and radiation shielding by appropriate materials.
- Knowing about the units of radiations and their safety limits, the devices to detect and measure radiation, such as the Geiger-Muller counter and scintillation counter.

### Applied Optics

- Understand basic lasing mechanism qualitatively, types of Lasers, characteristics of Laser Light, types of Lasers, and its applications in developing LED, Holography.
- Learn concept of Fourier optics and fourier transform spectroscopy.
- Understanding of basic principle and theory of Holography.
- Concept of total internal reflection.

### Weather Forecasting

- Acquire basic knowledge of the elements of the atmosphere, its composition at various heights, variation of pressure and temperature with height.
- To learn basic techniques to measure temperature and its relation with cyclones and anti-cyclones.
- Knowledge of simple techniques to measure wind speed and its directions, humidity and rainfall.
- Absorption, emission and scattering of radiations in atmosphere. Radiation laws.

### Introduction to Physical

- Understand the evolution of the CPU from microprocessor to microcontroller and embedded computers from a historical perspective.
- Understand the operation of basic electronic components and analog electronics and digital electronics building blocks including power supply and batteries.
- Be able to use CAD software to create schematic diagrams and printed circuit board layout.

- Understand how to use basic laboratory measurement equipment and instrumentation.

### Numerical Analysis

- The emphasis of course is to equip students with the mathematical tools required in solving problem of interest to physicists.
- To expose students to fundamental computational physics skills and hence enable them to solve a wide range of physics problems.
- To help students develop critical skills and knowledge that will prepare them not only for doing fundamental and applied research.
- It also prepares them for a wide variety of careers.

## 18. B. Sc (H) ZOOLOGY

### 18.1 Core Courses

### ZH Core-I: Non-Chordates I: Protists to Pseudocoelomates

- Learn about the importance of systematics, taxonomy and structural organization of animals.
- Appreciate the diversity of non-chordates living in varied habit and habitats.
- Understand evolutionary history and relationships of different non-chordates through functional and structural affinities.
- Critically analyse the organization, complexity and characteristic features of non-chordates making them familiarise with the morphology and anatomy of representatives of various animal phyla.

### ZH Core-II: Principles of Ecology

- Demonstrate an understanding of key concepts in ecology with emphasis on historical perspective, role of physical factors and concept of limiting factors.
- Comprehend the population characteristics, dynamics, growth models and interactions.
- Understand the community characteristics, ecosystem development and climax theories.
- Know about the types of ecosystems, food chains, food webs, energy models, and ecological efficiencies.

### ZH Core-III: Non-Chordates II: Coelomates

- Learn about the importance of systematics, taxonomy and structural organization of animals.
- Appreciate the diversity of non-chordates living in diverse habit and habitats.
- Understand evolutionary history and relationships of different non-chordates through functional and structural affinities.
- Critically think about the organization, complexity and characteristic features of non-chordates.

### ZH Core IV: Cell Biology

- Understand fundamental principles of cell biology.
- Explain structure and functions of cell organelles involved in diverse cellular processes.
- Appreciate how cells grow, divide, survive, die and regulate these important processes.
- Comprehend the process of cell signalling and its role in cellular functions.

### ZH Core V: Diversity of Chordates

- Understand different classes of chordates, level of organization and evolutionary relationship between different subphyla and classes, within and outside the phylum.
- Study about diversity in animals making students understand about their distinguishing features.
- Appreciate similarities and differences in life functions among various groups of animals in Phylum Chordata.
- Comprehend the circulatory, nervous and skeletal system of chordates.

### ZH Core -VI: Physiology: Controlling and Coordinating Systems

- Know the basic fundamentals and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue advanced degree courses.
- Comprehend and analyse problem-based questions.
- Recognize and explain how all physiological systems work in unison to maintain homeostasis in the body and use of feedback loops to control the same.
- Learn an integrative approach to understand the interactions of various organ systems resulting in the complex overall functioning of the body. Synthesize ideas to make connection between knowledge of physiology and real world situations, including healthy life style decisions and homeostatic imbalances

### ZH Core-VII: Fundamentals of Biochemistry

- Gain knowledge and skill in the fundamentals of biochemical sciences, interactions and interdependence of physiological and biochemical processes.
- Get exposed to various processes used in industries and gain skills in techniques of chromatography and spectroscopy.
- Demonstrate foundation knowledge in biochemistry; synthesis of proteins, lipids, nucleic acids, and carbohydrates; and their role in metabolic pathways along with their regulation.
- Know about classical laboratory techniques, use modern instrumentation, design and conduct scientific experiments, and analyse the resulting data.

### ZH Core-VIII: Comparative Anatomy of Vertebrates

- Explain comparative account of the different vertebrate systems.
- Understand the pattern of vertebrate evolution, organisation and functions of various systems.
- Learn the comparative account of integument, skeletal components, their functions and modifications in different vertebrates.

- Understand the evolution of heart, modification in aortic arches, structure of respiratory organs used in aquatic, terrestrial and aerial vertebrates; and digestive system and its anatomical specializations with respect to different diets and feeding habits.

### ZH Core IX: Physiology: Life Sustaining Systems

- Have a clear knowledge of basic fundamentals and understanding of advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue advanced degree courses.
- Comprehend and analyse problem-based questions on physiological aspects.
- Recognize and explain how all physiological systems work in unison to maintain homeostasis in the body; and use of feedback loops to control the same.
- Learn an integrative approach to understand the interactions of various organ systems resulting in the complex overall functioning of the body.

### ZH Core-X: Biochemistry of Metabolic Processes

- Gain knowledge and skill in the interactions and interdependence of physiological and biomolecules.
- Understand essentials of the metabolic pathways along with their regulation.
- Know the principles, instrumentation and applications of bioanalytical techniques.
- Get exposure to various processes used in industries.

### ZH Core-XI: Molecular Biology

- Describe the basic structure and chemistry of nucleic acids, DNA and RNA.
- Compare and contrast DNA replication machinery and mechanisms in prokaryotes and eukaryotes.
- Elucidate the molecular machinery and mechanism of information transfer processes– transcription and translation-in prokaryotes and eukaryotes.
- Explain post-transcriptional modification mechanisms for the processing of eukaryotic RNAs.

### ZH Core Course XII: Principles of Genetics

- Have a deeper understanding of the varied branches of the biological sciences like microbiology, evolutionary biology, genomics and metagenomics.
- Gain knowledge of the basic principles of inheritance.
- Analyse pedigree leading to development of analytical skills and critical thinking enabling the students to present the conclusion of their findings in a scientific manner.
- Know the mechanisms of mutations, the causative agents and the harmful impact of various chemicals and drugs being used in day to day life.

### ZH Core Course-XIII: Developmental Biology

- Understand the events that lead to formation of a multicellular organism from a single fertilized egg, the zygote.

- Acquire basic knowledge of the cellular processes of development and the molecular mechanisms underlying these.
- Describe the general patterns and sequential developmental stages during embryogenesis; and understand how the developmental processes lead to establishment of body plan of multicellular organisms.
- Discuss the general mechanisms involved in morphogenesis and to explain how different cells and tissues interact in a coordinated way to form various tissues and organs.

### ZH Core Course XIV: Evolutionary Biology

- Acquire problem solving and high order analytical skills by attempting numerical problems as well as performing simulation studies of various evolutionary forces in action.
- Apply knowledge gained, on populations in real time, while studying speciation, behaviour and susceptibility to diseases.
- Gain knowledge about the relationship of the evolution of various species and the environment they live in.
- Get motivated to work towards mitigating climate change so that well adapted species do not face extinction as a result of sudden drastic changes in environment.

## 18.2 Discipline Specific Elective Courses

### ZH DSE Course-I: Animal Behaviour and Chronobiology

- Understand types of animal behaviour and their importance to the organisms.
- Enhance their observation, analysis, interpretation and documentation skills by taking short projects pertaining to Animal behaviour and chronobiology.
- Relate animal behaviour with other subjects such as Animal biodiversity, Evolutionary biology, Ecology, Conservation biology and Genetic basis of the behaviour.
- Understand various process of chronobiology in their daily life such as jet lag.

### ZH DSE Course-II: Animal Biotechnology

- Use or demonstrate the basic techniques of biotechnology like DNA isolation, PCR, transformation, restriction digestion etc.
- Make a strategy to manipulate genetic structure of an organism for the improvement in any trait or its well-being based on the techniques learned during this course.
- Understand better the ethical and social issues regarding GMOs.
- Use the knowledge for designing a project for research and execute it.

### ZH DSE Course-II: Basics of Neuroscience

- Understand major advances in neuroscience, neural basis of emotions, behaviour, learning and memory, and how brain and behaviour can be trained/modified by experience.
- Discuss how the hypothalamus controls various behavioural patterns by releasing neurohormones/ neuropeptides in brain and periphery in response to various signals.

- Construct neural mechanisms of learning and memory (spatial and episodic memory etc.) and how specific circuits contribute to learning and memory.
- Develop an understanding about cognition, mechanism of our reaction to various situations and impact of neurological diseases on cognition.

### ZH DSE Course-IV Biology of Insecta

- Appreciate the diversity of insects.
- Understand the physiology of Insects which has made them the most successful animals in terms of numbers.
- Get a glimpse of the highly organized social life of insects.
- Know the variety of species of inspects.

### ZH DSE Course-V: Computational Biology

- Explain the basic concepts of Bioinformatics and Biostatistics and its various applications in different fields of biological sciences.
- Describe theoretically sources of biological data, and list various biological databases –nucleic acids, protein sequence, metabolic pathways and small molecule.
- Identify various file formats of sequence data and tools for submission of data in databases as well as retrieval of gene and protein data from databases .
- Annotate gene sequence and protein structure prediction

### ZH DSE Course-VI: Endocrinology

- Understand endocrine system and the basic properties of hormones.
- Appreciate the importance of endocrine system and the crucial role it plays along with the nervous system in maintenance of homeostasis.
- Gain insight into the molecular mechanism of hormone action and its regulation.
- Know the regulation of physiological process by the endocrine system and its implication in diseases.

### ZH DSE Course-VII: Fish and Fisheries

- Acquire knowledge of physiology, reproduction of fishes.
- Analyse different kinds of water and identify/differentiate different kinds of fishes.
- Procure pure fish seed by artificial procedures such as artificial and induced breeding which can learn by visiting any fish farm or demonstrated in research labs in college/Departments.
- Become aware and gain knowledge of In-land and marine Fisheries in India and how it contributes to Indian economy.

### ZH DSE Course-VIII: Immunology

- Describe the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity.
- Define the cellular/molecular pathways of humoral/cell-mediated adaptive responses including the role of Major Histocompatibility Complex.

- Explain the cellular and molecular aspects of lymphocyte activation, homeostasis, differentiation, and memory.
- Understand the molecular basis of complex, humoral (Cytokines and Complement) and cellular processes involved in inflammation and immunity, in states of health and disease.

### ZH DSE Course-IX: Parasitology

- Understand the variation amongst parasites, parasitic invasion in both plants and animals. applicable to medical and agriculture aspects.
- Help to know the stages of the life cycles of the parasites and the respective infective stages.
- Develop ecological model, know population dynamics of parasite, establishment of parasite population in host body, adaptive radiations and methods adopted by parasite to combat with the host immune system.
- Develop skills and realize significance of diagnosis of parasitic attack and treatment of patient or host.

### ZH DSE Course-X: Reproductive Biology

- Get in-depth understanding of morphology, anatomy and histology of male and female reproductive organs.
- Know different processes in reproduction starting from germ cell formation to fertilization and consequent pregnancy, parturition and lactation.
- Compare estrous and menstrual cycles and their hormonal regulation.
- Comprehend the interplay of various hormones in the functioning and regulation of the male and female reproductive systems.

### ZH DSE Course-XI: Wildlife Conservation and Management

- Become aware about the importance of wildlife in general, and its conservation and management in particular.
- Comprehend the application of the principles of ecology and animal behaviour to formulate strategies for the management of wildlife populations and their habitats.
- Understand the management practices required to achieve a healthy ecosystem for wildlife population along with emphasis on conservation and restoration.
- Know the key factors for loss of wildlife and important strategies for their in situ and ex situ conservation.

## 18.3 Generic Elective Courses

### ZH GE-I: Animal Cell Biotechnology

- Get a clear concept of the basic principles and applications of biotechnology.
- Know the basic techniques used in genetic manipulation helping them continue with higher studies in this field.
- Acquire knowledge of the basic principles, preparations and handling required for animal cell culture.

- Understand principles underlying the design of fermenter and fermentation process and its immense use in the industry.

### ZH GE-II: Animal Diversity

- Distinguish between major phyla of animals through a demonstrated understanding of their taxonomic classification and diversity.
- Describe the distinguishing characteristics of all major phyla.
- Understand the fundamental differences among animal body plans and relate them to function, taxonomic classification, and evolutionary relationships among phyla.
- Illustrate lifecycles, structure, function and reasons for importance of few representative organisms from different groups of animals.

### ZH GE-III: Aquatic Biology

- Know the physico-chemical environment, and its role in aquatic ecosystem.
- Learn about adaptations exhibited by organisms to survive in these typical conditions.
- Realize how human activities influence the physicochemical environment of water bodies, and devastating impact it has on aquatic organisms.
- Learn about the laws governing the use of freshwater systems, as well as the local, state, federal, and international agencies that enforce these laws to protect endangered and vulnerable species.

### ZH GE IV: Environment and Public Health

- Get familiarized with various aspects of environmental risks and hazards.
- Recognize the climate change due to human activities.
- Be aware about the various impacts of environmental degradation on human health through case studies and how it can be prevented.
- Learn about the nuclear and chemical disasters and their after effects through cases studies.

### ZH GE V: Exploring the Brain: Structure and Function

- Define the cellular- and anatomical-level organisation of the brain.
- Understand the properties of neuronal and non-neuronal cells that make up the brain including the propagation of electrical signals used for cellular communication.
- Comprehend how the interaction of cells and neural circuits leads to various higher-level activities like cognition and behaviour.
- Identify principles /mechanism underlying various neurological disorders.

### ZH GE-VI Food, Nutrition and Health

- Have a better understanding of the association of food and nutrition in promoting healthy living.
- Think more holistically about the relationship between nutrition science, social and health issues.

- Move on to do post-graduation studies and can apply for jobs as food safety officers, food analysts, food inspectors, food safety commissioners or controllers for jobs inorganizations like FSSAI.
- Specialize in various fields of nutrition.

### ZH GE-VII: Human Physiology

- Know the principles of normal biological function in human body.
- Outline basic human physiology and correlate with histological structures.
- Understand how animals maintain an internal homeostatic state in response to changes in their external environment.
- Learn about the physiology of the human body.

### ZH GE-VIII Insect Vector and Disease

- Identify different insects and classify them based on their morphology and behaviour.
- Describe the host-pathogen relationships and the role of the host reservoir on transmission of parasite.
- Explain various modes of transmission of parasite by insect vectors.
- Recognize various possible modern tools and methodologies for laboratory diagnosis, surveillance and treatment of diseases

## 18.4 Skill-Enhancement Elective Courses

### ZH SEC-I Apiculture

- Learn about the various species of honey bees in India, their social organization and importance.
- Be aware about the opportunities and employment in apiculture- in public, private and government sector.
- Gain thorough knowledge about the techniques involved in bee keeping and honey production.
- Know about various products obtained from beekeeping sector and their importance.

### ZH SEC -II Aquarium Fish Keeping

- Acquire knowledge about different kinds of fish their compatibility in aquarium.
- Become aware of Aquarium as commercial, decorative and of scientific studies.
- Develop personal skills on maintenance of aquarium.
- Know about the basic needs to set up an aquarium, i.e., dechlorinated water, reflector, filters, scavenger, aquatic plants etc. and the ways to make it cost-effective.

## ZH SEC-III Medical Diagnostics

- Understand the use of histology and biochemistry of clinical diagnostics and learn about the molecular diagnostic tools and their relation to precision medicine.
- Develop their skills in various types of tests and staining procedure involved in haematology, clinical biochemistry and will know the basics of instrument handling.
- Learn scientific approaches/techniques used in the clinical laboratories to investigate various diseases and will be skilled to work in research laboratories.
- Gain knowledge about common imaging technologies and their utility in the clinic to diagnose a specific disease.

## ZH SEC-IV: Research Methodology

- Describe basic concepts of research and its methodologies.
- Identify appropriate research topics and set up hypothesis.
- Perform literature review using library (print) and internet (online) resources.
- Design experiments/surveys, collect data and represent data in tables/figures

## ZH SEC-V Sericulture

- Learn about the history of sericulture and silk route.
- Recognize various species of silk moths in India, and exotic and indigenous races.
- Be aware about the opportunities and employment in sericulture industry- in public, private and government sector.
- Gain thorough knowledge about the techniques involved in silkworm rearing and silk reeling

## ZH SEC-VI Genetic Counselling

- Get acquainted with the diseases caused by genetic abnormalities.
- Develop the basic understanding of counselling the individuals based on the deductive methods.
- Deal with the various social and ethical aspects in relation to genetic diseases inheritance and its predictability in a responsible manner.
- Collect data about the history of a disease in a family and arrange it into a pedigree.

## ZH SEC-VII Environmental Audit

- To provide understanding by the students of general chronology of audit, audit strategy, audit program and audit procedures.
- To provide comprehensive idea to the students on the ethical principles of audit profession
- To develop an appropriate documentation for an environmental impact statement and to
- introduce the types of audit reports.
- To understand how the environmental commitments by industry can be monitored and audited

## 19. B.A (H) POLITICAL SCIENCE

### 19.1 Core Courses

#### Paper I- Understanding Political Theory

- Understand the various traditions and approaches of political theory .
- Appreciate how they get reflected in organizing social living.
- Understand multiple frames by which the idea of political community is debated.
- Understand the significance of theorizing and of applying theory into practice.

#### Paper II- Constitutional Government and Democracy in India

- be familiarized with the debates around the origin.
- Be aware of the evolution of the Indian constitution.
- become aware of the manner in which the government functions through its various organs.
- understand the division of power between various organs of the government at different levels

#### Paper III - Political Theory-Concepts and Debates

- Understand the dimensions of shared living (sociare) through these political values
- Understand the dimensions of shared living through these political concepts.
- Appreciate how these values and concepts enrich the discourses of political life.
- How they sharpen their analytical skills in the process.

#### Paper IV- Political Process in India

- gain insights into the interconnections between social and economic relations and the political process in India.
- understand the challenges arising due to caste, class, gender and religious diversities and also analyse the changing nature of the Indian state in the light of these diversities.
- make sense of the specificities of the political processes in India in the light of changes of the state practices, electoral system, representational forms and electoral behaviour.

#### Paper V - Introduction to Comparative Government and Politics

- This paper would enable students to understand the legacy of the discipline.
- Studying different political systems from different continents across the world will introduce students to a range of political regimes, culture and their political economy.
- Students will learn to delineate ways to understand how the state relates to the economy and how culture shapes the political discourse in a particular context.
- It would enhance the ability of students to use the analytical frame of gender, race, ethnicity and their intersectionality in comparative perspective.
  Students will develop reflective thinking and ability to ask relevant questions pertinent to the discipline and will also develop aptitude for research.

## Paper VI - Perspectives on Public Administration

- The student will be able to understand an overview of the discipline and how it is different from private administration.
- The student will be introduced to the evolution of the discipline, its changing contours through a study of the different theories, ranging from the classical, neo-classical and contemporary theories.
- The students will be better equipped to analyse processes of leadership and conflict-management that have become increasingly significant in contemporary administration.
- The student learns about major contemporary approaches in public administration.
- The student is specially made sensitive to the feminist perspective in Public Administration.

## Paper VII- Perspectives on International Relations and World History

- The students will have a comprehensive understanding of both historical processes and contemporary practices in International Relations.
- Major theoretical perspectives will broaden the critical insight and inculcate among students the significance and rigour of the study of international relations.
- The paper will go beyond eurocentrism in international relations and reflect on the global South perspectives.
- It will evolve analytical skills to further explore both theoretical and actual key milestones in international relations.

## Paper VIII - Political Processes and Institutions in Comparative Perspective

- The paper will equip students with an in-depth understanding of different political systems and regime types.
- Students would be able to contrast unitary and federal, democratic and authoritarian systems.
- It will help students to develop analytical skills to reflect institutional structures and their functioning such as party systems, electoral systems.
- It will provide insight into the process of evolution of nation state in the context of West and post-colonial societies.
  Students will develop insights into the process of democratisation in post-colonial, post- authoritarian and post-communist societies.

## Paper IX - Public Policy and Administration in India

- The student is introduced to theoretical perspectives on public policy, a major sub-discipline of public administration.
- This is a paper devoted specially to the Indian context, so the student will become familiar with details of public policy adopted in India.
- Students will recognize the significance of local governance – both rural and urban.
- The students will become familiar with a range of budgetary procedures and practices, as part of the budget cycle in India.
- The student is exposed to mechanisms of grievance redressal and a range of specific social welfare policies.

## Paper X - Global Politics

- The students will have conceptual clarity on meaning, nature and significance of globalization.

- The students will learn about the contemporary debates on the discourse of globalization.
- The students will also learn about the rise of financial networks and major actors of the global economy and their impact on state and sovereignty.
- The paper will enhance students' understanding of contemporary global issues like proliferation of nuclear weapons, ecology, international terrorism and human security.
- The paper will develop analytical skills of the students to reflect on the phenomenon of global governance.

### Paper XI - Classical Political Philosophy

- Understand how to read and decode the classics and use them to solve contemporary socio-political problems.
- Connect with historically written texts and can interpret it in a familiar way (the way Philosophers think).
- Clearly present their own arguments and thoughts about contemporary issues and develop ideas to solve them through logical validation.

### Paper XII - Indian Political Thought - I

- Having successfully completed this course, student will be able to demonstrate knowledge and understanding of basic concepts of ancient Indian political thought that are prevalent traditions of thought in India.
- They will develop a comparative understanding of Indian and western political thought.
- Student will be able to demonstrate knowledge and understanding of basic concepts of medieval Indian political thought.
- This course will also help students to identify and describe the key characteristics of Indian political thought and develop a strong understanding of selected historiographical debates.

### Paper XII - Indian Political Thought - II

- The course is aimed to equip students with critical understanding about modern Indian thought.
- The thematic exploration of ideas is meant to locate the topical debates on important subjects on a historical trajectory and reflect over the diverse possibilities exhibited in the writings of the respective thinkers.
- It is expected that at the end of the course the students will be able to think about issues and debates in contemporary India from multiple vantage points including its historical significance in the Indian tradition.
- It would also help them develop toleration and respect for diverse opinions and at the same time, to admire and appreciate the plurality within the modern Indian intellectual tradition.

### Paper XIII - Modern Political Philosophy

- Understand the idea of modernity.
- Establish a connection between societal changes posed through modernity and its prescribed political suggestions.
- Identify various tendencies in political philosophical discourse.
- Manage to answer various fundamental questions through problem-solving aptitude.

## 19.2 Discipline Specific Elective Courses

### DSE1 - Citizenship in a Globalizing World

- Develop a broad historical, normative and empirical understanding of the idea of citizenship.
- Understand different trajectories of the development/evolution of the concept of citizenship.
- Understand/assess some of the major ethical challenges that citizenship faces in the wake of globalization.
- Rapidly proliferating idea about the need of accommodating diversity in multicultural political settings.

### DSE2 - Human Rights in a Comparative Perspective

- The course will equip students with an understanding of debates on human rights through a comparative study of human rights concerns in different countries.
- While keeping India as a common case study in all thematic analyses, it will familiarise students with the historical evolution of human right.
- They will learn the theoretical frameworks and core themes that inform the debates on human rights.
- The course will enhance the students' understanding of state response to issues and human rights questions pertaining to structural violence, such as torture, terrorism, insecurity of minority communities, caste, race, gender-based violence and rights of adivasis from the human rights perspective.

### DSE3 - Development Process and Social Movements in Contemporary India

- Show knowledge of development policies and planning in India since independence.
- Understand the development strategies and their impact on industrial and agricultural Sphere.
- Understand the emergence of social movements in response to the development policies adopted by successive governments.
- Demonstrate awareness of the different trajectories of specific social movements in India, their demands and successes.

### DSE4 - Public Policy in India

- The student is introduced to the range of ideologies that influence the policy-making process.
- The student learns how to relate public policies to politics.
- The student learns how to relate public policies to the political economy.
- The student is able to have a grasp of the role of social movements and interest groups in the making of public policy.

### DSE5 - Colonialism and Nationalism in India

- Understand and engage with the different ways in which colonialism and nationalism have been understood.
- Understand of the nature of colonial rule and the way in which it consolidated itself in India.

- Demonstrate awareness of the impact of colonialism on Indian economy and society.
- Show knowledge of the gradual emergence of anti-colonial nationalist movement in India.
- Demonstrate an understanding of the distinct periods of the nationalist movement and the nature of resistance politics adopted in different phases.
  Show awareness of the various social movements, the kind of questions they raised and their contributions to the nationalist movement.

### DSE6 - India's Foreign Policy in a Globalizing World

- Students will learn about India's diplomatic manoeuvres in an essentially interest and power seeking global hierarchical relationship.
- Students will also learn about the challenges India faces in securing its interests as a postcolonial state.
- The study of India's ability to engage with powerful nations of the world like the USA, Russia and China will help students understand India's perspective on international relations.
- The course will enhance students' understanding of India's strategies in South Asia.
- Students will also learn about India's negotiation strategy in dealing with global trade, environment and security regime.

### DSE7 - Feminism: Theory and Practice

- Understand the concept of patriarchy.
- Its different approaches of feminism.
- Understand different trajectories of history of feminism as it developed in western, socialist and Indian contexts.
- Make sense of how patriarchy functions within the family.

### DSE8 - Dilemmas in Politics

- Why these dilemmas are part of the human condition.
- How societies negotiate them politically.
- How dilemmas can be solved.
- Learn to deal with them in an analytical context.

## 19.3 Generic Elective Courses

### GE1 - Nationalism in India

- Gain an understanding of the different theoretical perspectives on the emergence and development of nationalism in India.
- Demonstrate knowledge of the historical trajectory of the development of the nationalist movement in India, with specific focus on its different phases.
- Understand the contribution of various social movements in the anti-colonial struggle. Demonstrate awareness of the history of partition and the moment of independence that followed

### GE2 - Contemporary Political Economy

- The students will learn about diverse approaches to international political economy.

- The study of the role of international organisation in transforming the world economy will equip the students to understand the process of evolution of capitalism.
- Insights into issues and contentions of development and perspectives on globalisation will augment students' ability to assess its impact on culture, environment, military security dimensions and traditional knowledge systems.
- The paper will enable students to comprehend contemporary dilemmas in the socio-political, gender and ethnic domains.

### GE3 - Women, Power and Politics

- Understand the concept of patriarchy and feminism.
- They will also learn about family, community and state.
- Understand the history of women's movement.
- Why these movements emerged, and hence would be able to connect theory and practice.

### GE4 - Gandhi and the Contemporary World

- This course will help students to understand Gandhian philosophy in a critical and analytical manners.
- It will also help in describing the impact of Gandhian thought on Indian and global politics.
- It will help in identifying and explaining selected approaches.
- Methods that historians have used to study the history of anti-colonial Indian politics.

### GE5 - Understanding Ambedkar

- The course is designed to provide students the original writings and ideas of Ambedkar on diverse issues beyond caste and equip them to critically engage with the ideas, interpretations.
- By engaging with the original sources as well as secondary writings on Ambedkar's ideas that cover, caste, class, gender, religion, state, democracy and constitution the students will be able to understand a thinker in the context and contemporaneity.
- At the end of the course, students shall be equipped with the method of understanding the ideas, philosophy and relevance of a particular thinker.
- Students shall also be able to reflect on the method of the thinker's engagement with the then context, issues and concepts.
- Finally, the students shall be equipped in understanding the conceptual and philosophical diversity, situatedness and significance of Ambedkar beyond his contribution in the sphere of social justice and drafting the Indian constitution.
- The course thus provides an opportunity to the students to understand Ambedkar for his several important contributions in the field of religion, state, democracy, gender, economy and history.

### GE6 - Governance: Issues and Challenges

- The students are acquainted with the changing nature of governance in the era of Globalization.
- The students are introduced to the most contemporary ideas of sustainable development.
- They are exposed to green governance.

- The students become familiar with a rigorous introduction to the best practices in India on good governance.

### GE7 - Politics of Globalization

- The students will learn about the nature, significance and contemporary debates around globalization.
- The study of various approaches and concepts of globalization and the role of international economic organizations will augment students' knowledge on international political economy.
- The course will provide an insight into the alternative understanding of globalization and various critical aspects related to it.
- The paper will equip students with a comprehensive knowledge of the impact of globalization on developing countries in the context of contemporary international issues like civil society, social movements and human migration.

### GE8 - United Nations and Global Conflicts

- The students will learn about the evolution of the United Nations as an international organization, its principles and institutional structure.
- The course will develop an in depth understanding of the United Nations role in peacekeeping and peacebuilding since the Second World War.
- Students will learn about major global conflicts and the United Nations role in conflict management.
- The paper will evolve analytical skills of the students on the United Nations role in creating an equitable social economic world order.
- The course will assess United Nations contributions and shortcomings in maintaining international peace and security.
- The paper will enhance knowledge on the imperatives of reforming the organization in the contemporary global system.

## 19.4 Skill Enhancement Courses

### AE1 - Your Laws, Your Rights

- Demonstrate an understanding of law as a source of right.
- Develop an understanding of democratic values such as equality, justice etc. and learn about different laws enacted to uphold this value.
- Demonstrate an awareness of democratic rights guaranteed to Indian citizens and persons.
- Develop skills related to using ordinary legal procedures to safeguard the rights guaranteed to citizens and persons.
- Show basic awareness of ordinary procedures such as obtaining different kinds of identity documents.
- Show understanding of the structure and principles of the Indian legal system

### AE2 - Public Opinion and Survey Research

- Understand the importance of public opinion in a democracy and the role of survey research in comprehending the working of a democratic political system.
- Learn about the methods used for conducting surveys and interpreting survey data.

- Acquire basic skill sets related to understanding public opinion formation and conducting research through the use of sample data, framing a questionnaire, etc.
- Acquire basic skill sets related to measurement of public opinion such as data analysis using statistical methods.

### AE3 - Legislative Practices and Procedures

- Understand the structure and functions of law-making bodies in India at different levels.
- Demonstrate knowledge of the legislative procedures in India.
- Acquire skills related to a close reading of legislative documents.
- Understand the relationship between the people and their elected representatives.
- Develop beginners' skills to become a part of a support team engaged in different levels of the law-making functions

### AE4 - Peace and Conflict Resolution

- The paper will equip students with an in-depth understanding of theoretical and actual observations on both domestic and international sources of conflict and war, conflict resolution and conflict transformation.
- The students will enhance their analytical ability by learning about different models employed in conflict resolution.
- The course will develop an analytical outlook in conflict resolution on equitable, cooperative and non-violent techniques of conflict resolution and transformation.
- Further deliberations on peace movements across the world and especially in war torn regions will help students develop independent perspectives on conflict resolution.
- The study of issues like migration, information flow and normative concepts will Augment students' understanding and knowledge.

## 20. B.A (H) PHILOSOPHY

### 20.1 Core Courses:

### Indian Philosophy:

- Students of the B.A. (Honours) Indian Philosophy will understand the richness of Indian Intellectual Traditions through basic concepts such as Shruti (agama) and Smriti(Nigama), Karma, Jnana and Bhakti, Indian Idealism vs. Indian Materialism, Preyas, Shreyas and Nih Sreyas etc
- Students will appreciate the Indian Metaphysics of various ancient Indian schools such as Charvaka, Buddhism, Jainism, Samkhya,Mimamsa and Vedanta. They will become awareof the Metaphysics Of various schools which will help them to understand the society at large.
- Students will gain familiarity with the epistemology of Jaina and Nyaya – Vaisheshika system.
- Students will learn to develop scientific, logical and rational inquiry for understanding the systems. Students will able to do a comparative analysis of all systems which will further enhance their debating skills. Students will develop the ability to think critically and to read and analyse scientific literature.

- Students will develop strong oral and written communication skills through the effective presentation of Projects, Quiz as well as through Seminars.

Logic:

- Identify the underlying logical structure of written sentences.
- Learn to articulate arguments.
- Identify the logical structure of arguments.
- Analyse the logical structure of arguments.

Greek philosophy:

- This course facilitates a comprehension of early Greek tradition.
- A comprehensive understanding of it is like a foundation course in the Classics.
- The two great classical traditions, viz. Greek and Indian have left a rich legacy of philosophic knowledge that can be pragmatically and scholastically contextualised in the present-day times.
- Students of Delhi University read Indian Philosophy, this course in Greek Philosophy complements it fairly well for understanding the classics.

Ethics:

- The students after having run through basic ethical theories.
- They gain a better orientation from the ethical perspective.
- This course helps to understand events with a more rational basis.
- They are able to interpret events with a more rational basis.

Western Philosophy: Descartes to Kant

- It will enable students to witness how philosophers who were either predecessors or contemporaries evaluated the theories of others.
- It will advise them in distinguishing good arguments from bad arguments.
- It will enable students to have a better understanding of how a man thinks and what goes on into the making of human thought.
- It will also make students aware that there is no place for superficial approach to the complex questions in life.

Social and Political Philosophy: Indian & Western

- to make students better citizens by understanding the notion of democracy
- to know the rights of Individuals,
- to know the rights of communities.
- to learn to live in a cohesive manner in a multicultural setup.

Applied Ethics

- This course is designed to make students philosophically competent about their own decisions and to achieve clarity.
- They develop comprehension skills and reach precision in arguments with reasons.

- A spectrum of issues ranging from morality, environment, real life situations, moral dilemmas and ongoing philosophical examination.
- Crisis in the field of artificial Intelligence is a part of this course curriculum.

### Text of Indian Philosophy:

- After having done this course, the student is expected to have mastered the art of philosophically reading the given textual excerpts and to understand the issues hermeneutically afresh, keeping in mind the dialogical and pluralistic nuances employed in the epistemic enterprise.
- Improve core skills in philosophy, including the ability to interpret and engage with philosophical texts, evaluate arguments, and develop critical ideas in response.
- Connect issues in the Indian tradition with related themes in Western Philosophy.
- Grasp and analyse key issues in Indian Philosophy of Language, particularly with respect to the context principle, linguistic reference, and non denoting terms.

### Text of Western Philosophy:

- The idea is to encourage the students towards a comparative trajectory where they probe the similarities and differences between the Western and non-Western stands of thought. Hence, one of the key learning outcomes would be and should be to develop comparative skills.
- Most Western philosophers were also the patriarch of modern statecraft. They imbued moral and ethical considerations quite heavily in their philosophical teachings.
- Thus, by focussing on individual philosophical thought from original texts, the students would be capable of differentiating between positive and normative worldview.
- Since Philosophy, whether Western or Oriental, is all about values and rational thinking, the students would develop skills to place any public issue on the edifice of ethical foundations and provide moral weightage to their arguments.

### Truth Functional Logic

- It enhances logical reasoning and problem-solving skills.
- Students will explain and apply the basic concepts essential to a critical examination and evaluation of argumentative discourse.
- Students will use investigative and analytical thinking skills to examine alternatives.
- Explore complex questions and solve challenging problems.

### Analytic Philosophy

- Introducing students to the primary thinkers of one of the most important and influential school of thought in Western Philosophy.
- Acquainting students with the complex set of interconnected sub-traditions that Analytic Philosophy ramified into and which became equally influential in the twentieth Century.
- Inculcating young minds with the basic training associated with the tradition, such that it is prepared to engage in critical and reflective thinking.
- Enabling students to reduce complex issues into simpler components that will facilitate clearer understanding

### Continental Philosophy

- Make students gain familiarity with, and clear understanding of, the major thinkers of Continental tradition and their philosophy.
- Improved critical reading of the texts, their rational and logical understanding, and writing abilities.
- Students will learn to develop scientific, logical and rational inquiry for understanding the thinkers and their philosophy. Students will able to do a comparative analysis of all thinkers which will further enhance their debating skills. Students will develop the ability to think critically and to read and analyse scientific literature.
- This will help the students to develop openness to new ideas.
- Create awareness among the students of the complexity of issues and willingness to examine issues from many different perspectives.
- Students will reflect on and critically evaluate new and unfamiliar concepts.
- Exposure to various texts of Continental Philosophy.
- Students will develop strong oral and written communication skills through the effective presentation of Projects, Quiz as well as through Seminars.
- Finally, it will give a holistic development of their personality.

### Philosophy of Religion: Indian and Western

- The students will acquire a general understanding of religious issues.
- They will learn about Indian and Western religion.
- They will learn to think critically about religious issues.
- They will understand about the interplay of philosophy and religion.

### Philosophy of Language: Indian and Western

- Students are equipped with an enhanced ability to explain key distinctions in theories of Frege, Russell and Strawson.
- Grasping the philosophical position of Nyaya school of philosophy.
- Understanding the theory of meaning of words and sentences in Nyaya Siddhanta Muktavali.
- Students are able to know, towards the end of the course, what they learnt and communicate to others their understanding of the fundamental issues in philosophy of language.

## 20.2 Discipline Specific Elective Courses

### Philosophy of Mind

- An overview of the most important directions within the philosophy of mind in the 20$^{th}$ Century.
- An insight into issues that connect philosophy of mind to modern cognitive science.
- An understanding to appreciate that how human thinking involves context constituted by the body.
- An understanding that thinking extends beyond the brain and is embedded in the body's habitual encounters with the world.
- A cognizance how concepts involve the role of sensory, motor, affective experiences and are thus embodied.

## Philosophy of Science

- Students are equipped with an articulated basis for the philosophical analysis of scientific methodology.
- They no longer remain under the impact of scientific dogmas.
- Their ability to express their arguments with clarity and precision is enhanced with the study of Popper, Kuhn, Lakatos, Feyerabend, sequence of theories regarding scientific methodology and rationality of science.
- Students have understanding of latest changing trends in philosophy of science.

## Philosophy of Law

- The ideal outcome of this course is to make students understand the concept of law.
- Its place in our lives, its formal structure, rules and modalities.
- Students should be able to discuss and argue on crucial legal questions.
- They should be aware of the impact the life of common citizens with sensitivity, acumen, precision and insight**.**

## Indian Materialism

- The student after having done this course is expected to have a fair understanding of the theoretical construct.
- They will learn to relate traditions with philosophy.
- They should have argumentative force of materialism as a philosophical theory.
- Its significance in reading the Indian intellectual traditions today.

## Bio Ethics

- The learning outcomes of this course are multidimensional.
- It forms a strong base in the field of research of ethics and medicine care.
- It would also increase the students ability to identify their role in capacity building.
- It directly enforces students role in social responsibility

## Feminism

- Study of Feminism arms the student with analytical skills to develop valid arguments to counter gender discrimination, sexism and patriarchal dominance.
- Feminist theory has a social agenda i.e. to initiate transformation in social structures, customs and practices.
- Thus, the study of Feminism is not only an empowering tool against gender oppression.
- They should know about the systems of oppression such as race, class and colour.

## Indian Theories of Consciousness

- Students will have knowledge of the Indian Theories of Consciousness given in Mandukyopanishad, Bhagavadgita, Buddhism, Jainism, Samkhya , Charvaka, Nyaya and Advaita Vedanta.
- Students will learn to develop scientific, logical and rational inquiry for understanding the Indian Philosophical systems.
- Students will able to do a comparative analysis of all systems which will further enhance their debating skills.

- Students will develop strong oratory and writing skills through the effective presentation of projects, debates, as well as through Seminars, conferences, workshops.

### Aesthetics

- The course prepares the students to pursue art and culture.
- Students will also qualify for a career in media studies.
- They will be aware of aesthetically carrying out artistic endeavours.
- They will also learn to put aesthetics in their craft.

### Knowledge and Scepticism

- To learn about general issues in epistemology.
- To learn about the problems regarding the definition of knowledge.
- To learn about the justification of knowledge.
  To consider the challenge from radical scepticism and the responses

### Philosophy of Logic

- To learn about philosophy of logic, philosophical logic and philosophy and logic.
- To understand basic theories and problems regarding the notion of a proposition.
- To have a better understanding of terms like "analytic", "a priori", de dicto, de re, possible worlds, essentialism.
- To grasp the fundamental problems regarding existence, reference and presupposition.

## 20.3 General Elective Courses:

### Ethics in the Public Domain

- To equip the students with tools and techniques for handling socio political issues that affect them on an individual / collective basis.
- Larger awareness of public issues and empathy with marginalised issues in society.
- Inculcate a sense of ethical responsibility.
- Vision to challenge the existing norms in need of change.

### Formal Logic:

- Formal logic enhances the reasoning skills and develops ground for rejecting the wrong arguments on the basis of sound inferences.
- It creates ground for eliminating superstitious beliefs and creates ways for strong arguments.
- This paper helps in a good score that provides better rank in the form of results.
- It trains the student to construct good arguments and also provides valid ground to reject the wrong ones.

### Feminism:

- Study of Feminism arms the student with analytical skills.
- Develop valid arguments to counter gender discrimination, sexism and patriarchal dominance.

- Feminist theory has a social agenda i.e. to initiate transformation in social structures, customs and practices.
- Thus, the study of Feminism is not only an empowering tool against gender oppression but also against other systems of oppression such as race, class and colour.

### Critical Thinking

- Helps in generating productive/creative ideas for further use in difficult situation.
- Creates enthusiasm for taking a risk of dealing with difficult issues and finding a way out for solution.
- Provides valuable intellectual traits like courage, empathy, perseverance and faith in reason and encourage a flair for fairness and justice. As a result, a learner learns step by step how to arrive at an ideal solution keeping in mind all situational factors.
- Provides clarity in thinking as well as proper understanding of an issue to make it precise for further analysis.
- Helps to learn how to read, write and think critically, how to separate bad information from good information and helps in constructing cogent arguments.
- Finally, the learner becomes self-directed, self-monitored and self- corrective through this process of reflective thinking.

### Bio-Ethics

- The learning outcomes of this course are multidimensional.
- It forms a strong base in the field of research of ethics and medicine care.
- It would also increase the student's ability to identify their role in capacity building.
- It directly enforces student's role in social responsibility

### Symbolic Logic

- This course helps in learning the various principles and methods of basic as well as higher logic.
- Through the development of its special symbols, this course (advanced logic) helps as an instrument for analysis and deduction.
- It helps in examining more complex arguments for deriving clear rational conclusions.
- This paper helps in a good score that provides better rank in form of results.
- This is an appropriate paper for applying logical/mathematical skill and to make use of artificial intelligence effectively.

## 20.4 Skill-Enhancement Elective Courses

### Critical Thinking and Decision Making

- Helps in generating productive/creative ideas for further use in difficult situation.
- Creates enthusiasm for taking a risk of dealing with difficult issues and finding a way out for a solution.
- Provides valuable intellectual traits like how to critically read, listen and write and develop faith in reason and encourage a flair for fairness and justice. As a result, a learner learns step by step how to arrive at an ideal solution keeping in mind all situational factors.
- Provides clarity in thinking as well as proper understanding of an issue to make it precise for further analysis.

- Helps to use the skills of observation, analysis and evaluation and also provides sound reason for doubting and questioning.
- Finally, the learner becomes self-directed, self-monitored and self-corrective through this process of reflective thinking, and can proceed for the right choice.

### Art & Film Appreciation:

- It is a skill to develop and enhance philosophical analysis and contextualising in terms of Rasa, empathy and disinterestedness.
- Students read primary sources in philosophy and understand main arguments.
- Students compare and contrast the core of a philosophical problem, issue, or question by referencing the inquiry to a system (history, topic, philosophers, etc.).
- Students defend a philosophical position, view, or theory from more than one perspective.
- Students develop and defend student's own philosophical point of view.
- Students demonstrate a basic understanding of methods of philosophy .
- Students identify/recognize consistencies and inconsistencies of specific philosophical theories or worldviews.

## 21. B.A (H) HISTORY

## 21.1 CORE COURSES

### History of India- I

- Discuss The landscape and environmental variations in Indian subcontinent and their impact on the making of India's history.
- Describe main features of prehistoric and proto-historic cultures.
- List the sources and evidence for reconstructing the history of Ancient India.
- Analyse the way earlier historians interpreted the history of India and while doing so they can write the alternative ways of looking at the past.
- List the main tools made by prehistoric and proto- historic humans in India along with their find spots.
- Interpret the prehistoric art and mortuary practices.
- Discuss the beginning and the significance of food production.
- Analyse the factors responsible for the origins and decline of Harappan Civilization.
- Discuss various aspects of society, economy, polity and religious practices that are reflected in the Early Vedic and Later Vedic texts.
- Describe the main features of the megalithic cultures of the Central India, Deccan and South India.

### Social Formations and Cultural Patterns of the Ancient World-I

- Trace long term changes in the relationship of humans to their landscapes, to resources and to social groups.
- Discuss that human history is the consequence of choices made in ecological and biological contexts, and that these choices are not only forced by external forces like environmental change but are also enabled by changes in technology and systems of cultural cognition.

- Delineate the significance of early food production and the beginning of social complexity.
- Analyse the process of state formation and urbanism in the early Bronze Age Civilizations.
- Correlate the ancient past and its connected histories, the ways in which it is reconstructed, and begin to understand the fundamentals of historical methods and approaches.

## History of India- II

- Discuss various kinds of sources that the historians utilize to write the history of early historical and early medieval India.
- Analyse the processes and the stages of development of various types of state systems like monarchy, republican and centralized states as well as the formation of large empires.
- Discuss the ways in which historians have questioned the characterization of the Mauryan State.
- Delineate the changes in the fields of agriculture, technology, trade, urbanization and society and the major points of changes during the entire period.
- Describe the factors responsible for the rise of a good number of heterodox religious systems and adjustments and readjustments by various belief systems.
- Trace the processes of urbanization and de-urbanization & monetization and monetary crisis in early India.
- Analyse critically the changes in the varna/caste systems and changing nature of gender relations and property rights.
- Write and undertake projects related to literature, science, art and architecture.

## Social Formations and Cultural Patterns of the Ancient and Medieval World-II

- Identify the main historical developments in Ancient Greece and Rome.
- Gain an understanding of the restructuring of state and society from tribe-based polities to those based on territorial identity and citizenship.
- Trace the emergence and institutionalisation of social hierarchies and marginalisation of dissent.
- Explain the trends in the medieval economy.
- Analyse the rise of Islam and the move towards state formation in West Asia.
- Understand the role of religion and other cultural practices in community organisation.

## History of India- III (c. 750-1200)

- Critically assess the major debates among scholars about various changes that took place with the onset of the early medieval period in India.
- Explain, in an interconnected manner, the processes of state formation, agrarian expansion, proliferation of caste and urban as well as commercial processes.
- Discuss the major currents of development in the cultural sphere, namely bhakti movement, Puranic Hinduism, Tantricism, architecture and art.
- Discuss the emergence of a number regional languages.

## Rise of the Modern West- I

- Outline important changes that took place in Europe from the medieval period.

- Acquire an integrated approach to the study of economic, social, political and cultural developments in Europe.
- Explain the processes by which major transitions unfolded in Europe's economy, state forms, social structure and cultural life. Examine elements of early modernity in these spheres.
- Critically analyse linkages between Europe's state system and trade and empire.

## History of India- IV (c. 1200–1500)

- Discuss different kinds of sources available for writing histories of various aspects of life during the thirteenth to the fifteenth centuries.
- Critically evaluate the multiple perspectives from which historians have studied the politics, cultural developments and economic trends in India during the period of study.
- Appreciate the ways in which technological changes, commercial developments.
- Analyse the challenges to patriarchy by certain women shaped the times.

## Rise of the Modern West- II

- Explain major economic, social, political and intellectual developments in Europe during the 17th and 18th centuries.
- Contextualize elements of modernity in these realms.
- Discuss the features of Europe's economy and origins of the Industrial Revolution.
- Analyse the relationship between trade, empire, and slavery and industrial capitalism. Examine the divergence debate.

## History of India V (c. 1500-1600)

- Critically evaluate major sources available in Persian and vernacular languages for the period under study.
- Compare, discuss and examine the varied scholarly perspectives on the issues of the establishment, consolidation and nature of the Mughal state.
- Explain the changes and continuities in agrarian relations, land revenue regimes, Bhakti and Sufi traditions.
- Discuss how different means such as visual culture was used to articulate authority by the Rulers.
- Discern the nuances of the process of state formation in the areas beyond the direct control of the Mughal state.

## History of India- VI (c. 1750-1857)

- Outline key developments of the 18th century in the Indian subcontinent.
- Explain the establishment of Company rule and important features of the early colonial regime.
- Explain the peculiarities of evolving colonial institutions and their impact.
- Elucidate the impact of colonial rule on the economy.
- Discuss the social churning on questions of tradition, reform, etc. during first century of British colonial rule.
- Assess the issues of landed elite, and those of struggling peasants, tribals and artisans during the Company Raj.

### History of Modern Europe – I

- Identify what is meant by the French Revolution.
- Trace short-term and long-term repercussions of revolutionary regimes and Empire-building by France.
- Explain features of revolutionary actions and reactionary politics of threatened monarchical regimes.
- Delineate diverse patterns of industrialization in Europe and assess the social impact of capitalist industrialization.
- Analyse patterns of resistance to industrial capital and the emerging political assertions by new social classes.

### History of India- VII (c. 1600-1750)

- Critically evaluate the gamut of contemporaneous literature available in Persian and non-Persian languages for the period under study.
- Describe the major social, economic, political and cultural developments of the times.
- Explain the intellectual ferment of the seventeenth and eighteenth centuries and its relation to state policies.
- Discern the larger motives behind the Imperial patronage of art and architecture.
- Appreciate and express the continued expansion and dynamism of agriculture, crafts and maritime trade in India

### History of India VIII (c.1857 - 1950)

- Identify how different regional, religious, linguistic and gender identities developed in the late 19th and early 20th centuries.
- Outline the social and economic facets of colonial India and their influence on the national movement.
- Explain the various trends of anti-colonial struggles in colonial India.
- Analyse the complex developments leading to communal violence and Partition.
- Discuss the negotiations for independence, the key debates on the Constitution and need for socio-economic restructuring soon after independence

### History of Modern Europe- II

- Trace varieties of nationalists and the processes by which new nation-states were carved out.
- Discuss the peculiarities of the disintegration of large empires and remaking of Europe's Map.
- Deliberate on the meaning of imperialism and the manifestations of imperialist rivalry and expansion in the 19th and early 20th century.
- Analyse the conflict between radical and conservative forces, and the gradual consolidation of ultra-nationalist and authoritarian regimes in Europe.
- Contextualise major currents in the intellectual sphere and arts.

## 21.2 Discipline Specific Elective

### History of the USA: Independence to Civil War

- Explain the evolving and changing contours of the USA and its position in world politics.

- Examine the limits of American democracy in its formative stages.
- Analyse the character of early capitalism in the USA and resultant inequities.
- Describe the economics of slavery in USA along with details of slave life and culture.
- Explain the main issues related with the Civil War in USA and its various interpretations

### History of the USSR: From Revolution to World War II (c. 1917-1945)

- Demonstrate a nuanced understanding of the major issues in the History of the USSR between 1917 to 1945.
- Explain how the USSR emerged out of Imperial Russia.
- Summarize the steps in the consolidation of Bolshevik power.
- Explain the new organization of production in the fields and in the factory.
- Identify linkages between ideology, purges and propaganda.
- Examine Soviet policies for the period of the course in relation to nationalities and gender questions and literature and art forms.
- Outline Soviet foreign policy issues.

### History of Africa, c.1500-1960s

- Critique stereotypes on the African continent and outline major shifts in African history.
- Explain elements of change and continuity in the African political experience, political regimes and national formations, economy, society and cultural milieu from the 16th to 20th centuries.
- Contextualise the impact of colonialism on the African continent.
- Explain social protest and anti-colonial resistance in Africa, as well as practices of 'transculturation'.
- Discuss the dilemmas and contradictions emerging from the post-independence economic, social, political and cultural milieu.

### Gender in Indian History up to 1500 CE

- Explain critical concepts such as gender and patriarchy and demonstrate their use as tools for historical analysis.
- Examine the role and functioning of power equations within social contexts in Indian history during the ancient period, in the construction of gender identities.
- Critically examine representations of gender in literature, focusing on ideas of love, manliness and religiosity.
- Examine the role of social and political patronage of art and literature in perpetuating gender inequalities

### History of the USA: Reconstruction to New Age Politics

- Explain the reasons for the implementation of 'Reconstruction' and the causes for its limited success.
- Analyse the growth of capitalism in USA especially in terms of big business, Monopolosim etc.
- Examine the features of Labour Union movements.
- Discern the history of Populist and Progressive movements along with introduction of New Deal in response to the Great Depression.

- Describe the nature of Women's Liberation movement and also explain the 'Pastoralization' of Housework.
- Illustrate the significance of Civil Rights Movements and Martin Luther King Jr.

### History of the USSR: The Soviet Experience (c. 1945-1991)

- Outline and explain key developments in the history of the USSR between 1945 and 1991.
- Critically analyse the Soviet political system and its global impact.
- Co-relate the various developments to culture and literary growth.
- Explain the origins, developments and the end of the Cold War.
- Analyse the factors leading to economic slowdown, disintegration of the Soviet Union and the formation of Confederation of Independent States.

### History of Latin America, c.1500-1960s

- Critique stereotypes on Latin America and outline major shifts in Latin American history.
- Explain elements of change and continuity in Latin American politics, economy, society and cultural milieu from the 16th to 20th centuries.
- Contextualise the impact of colonialism on Latin America.
- Explain social protest and anti-colonial resistance in Latin America, as well as practices of 'transculturation'.
- Discuss the dilemmas and contradictions emerging from the post-independence economic, social, political and cultural milieu.

### Gender in Indian History, c.1500-1950

- Explain critical concepts such as gender and demonstrate its use as a tool for historical analysis, through a historiographical engagement.
- Critically assess popularly held notions about women in Islamic empires
- Examine critical issues of gender and power in the context of medieval and early Modern Indian history.
- Examine the social reforms around the 'women's question' in the modern period of Indian history.
- Explore the popular culture of the modern period to study the dynamics of class and caste in the context of marriage and society.
- Discuss issues of gender in the context of partition and the post-partition period of the construction of the independent state

### History of Modern India (c.1840s-1950s)

- Develop an in-depth understanding of China's engagement with the challenges posed by imperialism, and the trajectories of transition from feudalism to a bourgeois/ capitalist modernity.
- To locate these historical transitions in light of other contemporaneous trajectories into a global modernity, especially that of Japan.
- Analyse significant historiographical shifts in Chinese history, especially with reference to the discourses of nationalism, imperialism, and communism.
- Investigate the political, economic, social and cultural disruptions caused by the breakdown of the century's old Chinese institutions and ideas, and the recasting of tradition to meet modernist challenges.

- Comprehend the genesis and unique trajectories of the Chinese Communist Revolution.
- Locate the rise of China and Japan in the spheres of Asian and world politics respectively.

## The Making of pre-Colonial Southeast Asia

- Explain the processes of state formation, the localization and spread of religious traditions like Islam and Buddhism.
- Analyse the impact of the European presence on local society.
- Examine the impact of maritime activity of local society and polity and the developments in the economic and architectural history of the region.
- Discern the history of Populist and Progressive movements along with introduction of New Deal in response to the Great Depression.
- Describe the historiographical trends to study history of Southeast Asia

## Global Ecological Histories

- Critique an understanding of environmental concerns based on a narrow scientific/technological perspective.
- Discuss environmental issues within a social- political framework.
- Examine the role of social inequality, i.e. unequal distribution of and unequal access to environmental resources. This is critical in gaining an understanding of the environmental crisis of the world - from the global to the local.
- Examine the complexities of resource distribution and inequalities of resource use, locating these within specific social contexts, with reference to case studies regarding water rights and forest rights.
- Locate solutions to environmental problems within a framework of greater democratisation of resource use.
- Problematise (or critique?) the notion of a pristine past - of perfect balance between human societies and nature in pre-modern times.

## History of Modern Japan (c. 1868-1950s)

- Explain Japan's attempts to create new institutional structures and recast traditions to encounter challenges of the west.
- Analyse historiographical shifts in Japanese history in the context of global politics.
- Examine the divergent pathways to modernity followed by Japan.
- Examine distinct perspectives on imperialism and nationalism in East Asia, and understand how historiographical approaches are shaped by their contexts.
- Conceptualise how these distinct histories can be rooted in common cultural traditions.
- Locate and contextualise the history of Japan in world politics.
- Critically discuss contemporary international studies with much greater clarity based on the knowledge of history and culture of Japan.

## History of Southeast Asia: Colonial to the Post-colonial

- Explain the character and functioning of colonial state and society.
- Analyse the impact of the European presence on maritime and agrarian economy of the region.

- Examine the impact of maritime activity of local society and polity and the developments in the economic and architectural history of the region.
- Discern the influences of new forms of knowledge, Euro-centric notions of modernity and how ideas of race defined local religion.
- Illustrate the transformation of the local agrarian and labour economy.
- Interpret the history of popular movements and peasant revolts.
- Describe the historiographical trends to study history of Southeast Asia

### The Making of Contemporary India (c. 1950-1990s)

- Draw a broad outline of the history and politics of the early years of Independence, including the framing of the constitution and the linguistic reorganisation of states.
- Examine critically issues of economic development in the early years of Independence, particularly the problems of development.
- Summarize critical issues pertaining to the history of Non-Alignment and Panchsheel.
- Trace the significant developments in the history of India, since 1947, including the history of the Congress party, the Naxalbari and the JP Movement, as well as political developments in the regional context.
- Examine issues of critical relevance in the history of India from 1970s to 1990s, with special emphasis on caste assertion and mobilisation in politics and right-wing nationalism.
- Outline and examine the major developments in the history of social reform around the question of 'Women and law'.
- Evaluate the history of Environmental movements in India since Independence.
- Examine the formation of a 'civil society' and the emergence of popular movements in North East India.
- Trace the history of Judiciary in Independent India with special focus on Public Interest Litigation.
- Construct a history of Media in modern India, a history of Modern Indian Art and one of Sports as well as evaluate the significance of these in the making of a Modern Nation

## 21.3 Generic Elective Courses

### Delhi through the Ages: The Making of its Early Modern History

- Analyse different kinds of sources -- archaeological, architectural and a variety of textual materials.
- Use these materials and correlate their discordant information.
- Analyse processes of urbanization and state formation.
- Describe the difficulties in appropriating narratives of the state with the history of particular localities.

### Science, Technologies and Humans: Contested Histories

- Critique the prevalent dominant understanding of science and technology.
- Discuss the complex relations between science, technology and society.
- Examine the role of politics associated with scientific and technological developments and its economics in the capitalist economy.
- Examine the character of 'dual use' technologies.
- Define various initiatives taken by the government for promotion of science and technology.

## The World After 1945

- Analyse the evolving polities, societies and cultures of an increasingly global world.
- Analyse diverse social movements and cultural trends.
- Analyse processes of Decolonisation and politics during the Cold War era.
- Draw inferences to explain the interconnectedness of various facets of culture; sports, music, cinema, etc.

## History and Culture: Representations in Texts, Objects & Performance

- Identify complex nature of kingship in medieval times through the case study of Krishnadevaraya of Vijayanagara.
- Discuss the nature of identities and interactions between different groups of people in the past and the present.
- Examine the complex nature of religious communities in the past and their fluid participation in ritual and culture.
- Illustrate how culture is communicated through narrative strategies and performative acts.
- Distinguish That textuality and performativity are not binary opposites and are mutually interactive.
- Develop analytical skills that are necessary for students of literature, sociology, anthropology, religion, psychology, political science and South Asian studies.

## Politics of Nature

- Critique an understanding of environmental concerns based on a narrow scientific/ technological perspective.
- Discuss environmental issues within a social and political (or social scientific?) framework.
- Examine the role of social inequality. How does unequal distribution of and unequal access to environmental resources help understand the environmental crisis of the world - from the global to the local.
- Examine the complexities of resource distribution and inequalities of resource use, locating these within specific social contexts, with reference to case studies regarding water rights and forest rights.
- Locate solutions to environmental problems within a framework of greater democratisation of resource use.
- Problematise (or critique?) the notion of a pristine past - of perfect balance between human societies and nature in pre-modern times.

## Making of Post-colonial India

- Explain the complexities involved in the making of the constitution.
- Analyse the reasons behind the linguistic reorganisation of states.
- Analyse foreign policy of India during formative stages of independent India.
- Draw inferences to explain the functioning of different political parties.
- Explain the character of emergency and its consequences.
- Discern the nuances of the Indian judicial system.

### Religion and Religiosity

- Describe the basic chronological, spatial and substantive contours of each of the religious traditions as well as certain intellectual currents that questioned them.
- Analyse and articulate the long-term changes that each religious tradition undergoes in a dynamic relationship with its own past, with non-religious aspects of life, and with other religious traditions.
- Identify and describe the formation of religious boundaries, identities and the scope for the liminal spaces in between.
- Appreciate, examine and relate to the debates on the ways in which the modern Indian state and its constitution must deal with the issue of plurality of religious beliefs and practices.

### Inequality and Difference

- Critique the prevalent dominant understanding of Caste, Gender, and Tribe.
- Discuss the complex relations between differences and inequalities.
- Examine the inherent politics in the creation of inequalities and differences.
- Outline various initiatives taken by the government to prohibit caste-gender atrocities and uplift of deprived sections of society and its limitations.

### Delhi through the Ages: From Colonial to Contemporary Times

- Contextualize contemporary questions with regard to the city in the light of its colonial past and lived present.
- Analyse the political developments and their legacy for the shaping of the city.
- Discern importance of 'local' social, ecological and cultural processes that shape and reshape the city.
- Explain the historical roots of the problems of sustainable urbanization with regards to Delhi.

## 21.4 Skill Enhancement Courses

### Understanding Heritage

- Explain the complex character of heritage.
- Analyse the historical processes which result in the making of heritage.
- Describe the significance of cultural diversity in the creation of heritage.
- Illustrate how heritage can be a medium to generate revenue.
- Discern the nuances of heritage and will appreciate its importance.

### Archives and Museums

- Examine these two repositories of history from close quarters.
- Discuss the role of Colonialism in the growth of Archives and Museums.
- Explain how the documents and artefacts are preserved and the difficulties faced in the process.
- Demonstrate the way in which museums are organised and managed.
- Examine the considerations which govern the way exhibitions in museums are managed.

## Indian Art and Architecture

- Explain how Indian art was perceived and received in the west under colonial rule and its changing perspectives. This will set the template for examining its various manifestations.
- Through specific examples the student will be able to identify the historical context, socio-economic processes that went in the formation of art and architectural forms.
- Identify The stylistic features of different genres of art.
- Discuss the iconography of art forms.
- Differentiate between high/courtly art, popular art/folk, and tribal art.
- Point out the continuity in patterns and regional variations.
- Elaborate patronage patterns, artist-patron relations and representation of gender.

## Understanding Popular Culture

- Discuss the range of theoretical perspectives that define popular culture.
- Describe the methodological issues involved in a historical study of popular culture.
- Identify the relevant archives necessary for undertaking a study of popular culture, while pointing out the problems with conventional archives and the need to move beyond them.
- Interpret these theoretical concerns through a case study.
- Examine the role of orality and memory in popular literary traditions.
- Demonstrate the evolution of theatre and dance within the popular performative traditions.
- Analyse the role of technology in the transformation of music from elite to popular forms.
- Examine the relationship between recipes/recipe books and the construction of national/regional identities.
- Discuss the history of the cultures of food consumption and its relationship with the constitution of a modern bourgeoisie.
- With specific reference to art, media and cinema, examine the processes through which a pattern of 'public cultural consumption' emerged in contemporary times

## Historian’s Craft

- Outline / illustrate the need for historical perspective.
- Explain the historical nature of all human activities and social sphere.
- Distinguish essential features of historical inquiry.
- Identify a social phenomenon and use a historical perspective to contextualize the concerned phenomenon, i.e. trace its changing nature / dynamics.
- Delineate sources that can be used to describe and interpret a social issue, an event, a given time period, or a wider social development.
- Differentiate between sources and assess their credibility in defining a historical development.
- Demonstrate the ability to interpret sources, and to identify biases and blind spots in a historical narrative.

## History, Sociology and Anthropology

- Analyse the cultural meanings of texts and undertake field-work relating to oral and social Practices.
- Distinguish between the history, theory and practice of Sociological-Anthropological History.

- Discuss the relevance of historical ethnography applicable to a variety of vocational areas.
- Describe the significance of Sociological-Anthropological History to examine the questions of gender, religion and environment.

## 22. B. SC (H) CHEMISTRY

### 22.1 Core Courses

#### C I: INORGANIC CHEMISTRY - I (Atomic Structure & Chemical Bonding)

- Solve the conceptual questions using the knowledge gained by studying the quantum mechanical model of the atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals, and periodicity in atomic radii, ionic radii, ionization energy and electron affinity of elements.
- Draw the plausible structures and geometries of molecules using Radius Ratio Rules, VSEPR theory and MO diagrams (homo- & hetero-nuclear diatomic molecules).
- Understand the concept of lattice energy using Born-Landé and Kapustinskii expression.
- Rationalize the conductivity of metals, semiconductors and insulators based on the Band theory

#### C II: PHYSICAL CHEMISTRY - I (States of Matter & Ionic Equilibrium)

- Derive mathematical expressions for different properties of gas, liquid and solids and understand their physical significance.
- Explain the crystal structure and calculate related properties of cubic systems.
- Explain the concept of ionization of electrolytes with emphasis on weak acid and base and hydrolysis of salt.
- Apply the concepts of gas equations, pH and electrolytes while studying other chemistry courses and everyday life.

#### C III: ORGANIC CHEMISTRY - I (Basics and Hydrocarbons)

- Understand and explain the different nature and behaviour of organic compounds based on fundamental concepts learnt.
- Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
- Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
- Understand the fundamental concepts of stereochemistry.

#### C IV: PHYSICAL CHEMISTRY - II (Chemical Thermodynamics and its Applications)

- Understand the three laws of thermodynamics, concept of State and Path functions, extensive and intensive properties.
- Derive the expressions of $\Delta U$, $\Delta H$, $\Delta S$, $\Delta G$, $\Delta A$ for ideal gases under different conditions.

- Explain the concept of partial molar properties.
- Explain the thermodynamic basis of colligative properties and applications in surroundings

### C V: INORGANIC CHEMISTRY - II (s- and p-Block Elements)

- Learn the fundamental principles of metallurgy and understand the importance of recovery of by-products during extraction.
- Understand the basic and practical applications in various fields of metals and alloy behaviour and their manufacturing processes.
- Apply the thermodynamic concepts like that of Gibbs energy and entropy to the principles of extraction of metals.
- Understand the periodicity in atomic and ionic radii, electronegativity, ionization energy, electron affinity of elements of the periodic table.

### C VI: ORGANIC CHEMISTRY - II (Halogenated Hydrocarbons and Oxygen Containing Functional Groups)

- Understand preparation and properties of haloalkanes, haloarenes and oxygen containing functional groups.
- Understand reactions of haloalkanes, haloarenes and oxygen containing functional groups.
- Use the synthetic chemistry learnt in this course to do functional group transformations.
- To propose plausible mechanisms for any relevant reaction.

### C VII: PHYSICAL CHEMISTRY–III (Phase Equilibria and Electrochemical Cells)

- Understand phase equilibrium, criteria and CST.
- They will learn about the Gibbs-Duhem-Margules equation.
- Learn the working of electrochemical cells and galvanic cell.
- They will learn about corrosion and happenings in surroundings related to electrochemistry.

### C VIII: INORGANIC CHEMISTRY - III (Coordination Chemistry)

- Understand the terms, ligand, denticity of ligands, chelate, coordination number and use standard rules to name coordination compounds.
- Discuss the various types of isomerism possible in such compounds and understand the types of isomerism possible in a metal complex.
- Use Valence Bond Theory to predict the structure and magnetic behaviour of metal complexes and understand the terms inner and outer orbital complexes .
- Explain the meaning of the terms $\Delta o.$, $\Delta t$, pairing energy, CFSE, high spin and low spin and how CFSE affects thermodynamic properties like lattice enthalpy and hydration enthalpy

## CIX: ORGANIC CHEMISTRY – III (Nitrogen containing functional groups, Polynuclear Hydrocarbons, Heterocyclic Chemistry, Alkaloids and Terpenes)

- Gain theoretical understanding of chemistry of compounds having nitrogen containing functional groups, heterocyclics, polynuclear hydrocarbons, alkaloids and terpenes which includes various methods for synthesis through application of the synthetic organic chemistry concepts learnt so far.
- Become familiar with their particular properties, chemical reactions, criterion of aromaticity with reference to polynuclear hydrocarbons and heterocyclic compounds, trends in basicity of amines and heterocyclic compounds and their behaviour at different pH.
- Learn practical approach to structural elucidation of organic compounds with specific examples of terpenes and alkaloids.
- Predict the carbon skeleton of amines and heterocyclic compounds via use of Hoffmann's exhaustive methylation and Emde's modification methods.

## C X: PHYSICAL CHEMISTRY–IV (Conductance & Chemical Kinetics)

- Explain the chemistry of conductance and its variation with dilution, migration of ions in solutions.
- Learn the applications of conductance measurements.
- Have understanding of rate law and rate of reaction, theories of reaction rates and catalysts; both chemical and enzymatic.
- Have knowledge of the laws of absorption of light energy by molecules and the subsequent photochemical reactions.

## C XI: ORGANIC CHEMISTRY - IV (Biomolecules)

- Understand the structure of biomolecules.
- They will demonstrate what determines reactivity and biological functions of biomolecules.
- Gain insight into concepts of heredity through the study of genetic code, replication, transcription and translation.
- Demonstrate understanding of metabolic pathways, their inter-relationship, regulation and energy production from biochemical processes.

## C XII: PHYSICAL CHEMISTRY–V (Quantum Chemistry & Spectroscopy)

- Learn about limitations of classical mechanics.
- Learn about their solution in terms of quantum mechanics for atomic/molecular systems.
- Develop an understanding of quantum mechanical operators, quantization, probability distribution, uncertainty principle and application of quantization to spectroscopy.
- Interpret various types of spectra and know about their application in structure elucidation.

## C XIII: INORGANIC CHEMISTRY - IV (Organometallic Chemistry & Bio-inorganic Chemistry)

- Understand and explain the basic principles of qualitative inorganic analysis.

- Apply 18-electron rule to rationalize the stability of metal carbonyls and related species.
- Understand the nature of Zeise's salt and compare its synergic effect with that of carbonyls.
- Identify important structural features of the metal alkyls tetrameric methyl lithium and dimeric trialkyl aluminium and explain the concept of multicenter bonding in these compounds.

### C XIV: ORGANIC CHEMISTRY - V (Spectroscopy and Applied Organic Chemistry)

- Gain insight into the basic principles of UV, IR and NMR spectroscopic techniques.
- Use spectroscopic techniques to determine structure and stereochemistry of known and unknown compounds.
- Develop a sound understanding of the structure of Pharmaceutical Compounds. They will also understand the importance of different classes of drugs and their applications for treatment of various diseases.
- Learn about the chemistry of natural and synthetic polymers including fabrics and rubbers.

## 22.2 Discipline Specific Elective Courses (Same for Physical Sciences with Chemistry)

### DSE-1 - Novel Inorganic Solids

- Understand the mechanism of solid-state synthesis.
- Explain about the different characterization techniques and their principle.
- Understand the concept of nanomaterials, their synthesis and properties.
- Explain the mechanism of growth of self-assembled nanostructures.

### DSE-2 - Inorganic Materials of Industrial Importance

- Learn the composition and applications of the different kinds of glass.
- Understand glazing of ceramics and the factors affecting their porosity.
- Give the composition of cement and discuss the mechanism of setting of cement.
- Explain the suitability of fertilizers for different kinds of crops and soil.

### DSE-3 - Applications of Computers in Chemistry

- Have knowledge of most commonly used commands and library functions used in QBASIC programming.
- Develop algorithm to solve problems.
- Write corresponding programs in BASIC for performing calculations involved in laboratory experiments and research work.
- Use various spreadsheet software to perform theoretical calculations and plot graphs.

### DSE-4 - Analytical Methods in Chemistry

- Perform experiment with accuracy and precision.
- Develop methods of analysis for different samples independently.
- Test contaminated water samples.

- Understand basic principle of instrument like Flame Photometer, UV-vis spectrophotometer.

### DSE-5 - Molecular Modelling and Drug Design

- Understand theoretical background of computational techniques and selective application to various molecular systems.
- Learn Energy minimization methods through use of different force fields.
- Learn ESP Plots by suitable soft wares, electron rich and electron deficient sites.
- Compare computational and experimental results and explain deviations.

### DSE-6 - Polymer Chemistry

- Know about history of polymeric materials and their classification.
- Learn about different mechanisms of polymerization and polymerization techniques.
- Evaluate kinetic chain length of polymers based on their mechanism.
- Differentiate between polymers and copolymers

### DSE-7 - Research Methodology for Chemistry

- Learn how to identify research problems.
- Evaluate local resources and need for addressing the research problem.
- Find out local solution.
- Know how to communicate the research findings.

### DSE-8 - Green Chemistry

- Understand the twelve principles of green chemistry and will build the basic understanding of toxicity, hazard and risk of chemical substances.
- Understand stoichiometric calculations and relate them to green chemistry metrics. They will learn about atom economy and how it is different from percentage yield.
- Learn to design safer chemical, products and processes that are less toxic, than current alternatives. Hence, they will understand the meaning of inherently safer design for accident prevention and the principle "what you don't have can't harm you".
- Understand benefits of use of catalyst and bio catalyst, use of renewable feed stock which helps in energy efficiency and protection of the environment, renewable energy sources, importance led reactions in various green solvents.

### DSE-9 - Industrial Chemicals and Environment

- The different toxic gases and their toxicity hazards.
- Safe design systems for large scale production of industrial gases.
- Manufacturing processes, handling and storage of inorganic chemicals.
- Hazardous effects of the inorganic chemicals on human beings and vegetation.

### DSE-10 - Instrumental Methods of Chemical Analysis

- Handle analytical data.

- Understand basic components of IR, FTIR, UV-Visible and Mass spectrometer.
- Interpret of IR, FTIR, UV-visible spectra and their applications.
- Understand the use of single and double beam instruments.

### DSE-11 - Nanoscale Materials and Their Applications

- Understand the concept of nanodimensions.
- Know the various methods of preparation of nanomaterials.
- Know the different characterization techniques used for the analysis of nanomaterials and understand the basic principle behind these techniques.
- Understand the optical and conducting properties of nanostructures.

### DSE-12 - Dissertation

- Do survey, study and cite published literature on a particular area of interest.
- Correlate the experimental observations with theoretical understanding.
- Interpret results, write a report and submit to the supervisor.
- Use laboratory resources judiciously.

## 22.3 Generic Elective Courses

### GE-1 - Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons

- Solve the conceptual questions using the knowledge gained by studying the quantum mechanical model of the atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals, and periodicity in atomic radii, ionic radii, ionization energy and electron affinity of elements.
- Draw the plausible structures and geometries of molecules using radius ratio rules, VSEPR theory and MO diagrams (homo- & hetero-nuclear diatomic molecules).
- Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt.
- Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.

### GE-2 - Chemical Energetics, Equilibria and Functional Group Organic Chemistry-I

- Understand the laws of thermodynamics, thermochemistry and equilibria.
- Understand concept of pH and its effect on the various physical and chemical properties of the compounds.
- Use the concepts learnt to predict feasibility of chemical reactions and to study the behaviour of reactions in equilibrium.
- Understand the fundamentals of functional group chemistry through the study of methods of preparation, properties and chemical reactions with underlying mechanism.

### GE-3 - Solutions, Phase Equilibrium, Conductance, Electrochemistry and Functional Group Organic Chemistry-II

- Explain the concepts of different types of binary solutions-miscible, partially miscible and immiscible along with their applications.

- Explain the thermodynamic aspects of equilibria between phases and draw phase diagrams of simple one component and two component systems.
- Explain the factors that affect conductance, migration of ions and application of conductance measurement.
- Understand different types of galvanic cells, their Nernst equations, measurement of emf, calculations of thermodynamic properties and other parameters from the emf measurements.

### GE-4 - Chemistry of s- and p-Block Elements, States of Matter and Chemical Kinetics

- Understand the chemistry and applications of s- and p-block elements.
- Derive ideal gas law from kinetic theory of gases and explain why the real gases deviate from ideal behaviour.
- Explain Maxwell-Boltzmann distribution, critical constants and viscosity of gases.
- Explain the properties of liquids especially surface tension and viscosity.

### GE-5 - Chemistry of d-Block Elements, Quantum Chemistry and Spectroscopy

- Understand chemistry of d and f block elements, Latimer diagrams, properties of coordination compounds and VBT and CFT for bonding in coordination compounds.
- Understand basic principles of quantum mechanics: operators, eigen values, averages, probability distributions.
- Understand and use basic concepts of microwave, IR and UV-VIS spectroscopy for interpretation of spectra.
- Explain Lambert-Beer's law, quantum efficiency and photochemical processes.

### GE-6 - Organometallics, Bioinorganic Chemistry, Polynuclear Hydrocarbons and UV, IR Spectroscopy

- Understand the chemistry and applications of 3d elements including their oxidation states and important properties of the familiar compounds potassium dichromate, potassium permanganate and potassium ferrocyanid.
- Use IR data to explain the extent of back bonding in carbonyl complexes
- Get a general idea of toxicity of metal ions through the study of Hg2+ and Cd2+ in the physiological system.
- Understand the fundamentals of functional group chemistry, polynuclear hydrocarbons and heterocyclic compounds through the study of methods of preparation, properties and chemical reactions with underlying mechanism.

### GE-7 - Molecules of Life

- Learn and demonstrate how the structure of biomolecules determines their chemical properties, reactivity and biological uses.
- Gain an insight into mechanism of enzyme action and inhibition.
- Understand the basic principles of drug-receptor interaction and SAR.
- Understand biological processes like replication, transcription and translation.

### GE-8 - Green Chemistry: Designing Chemistry for Human Health and Environment

- Understand what is waste and how waste generation can cause serious repercussions on our environment while simultaneously causing enormous damage to human health.
- Recognize and acknowledge the role of green chemistry in reducing waste, learn about new strategies (emerging green technologies-green catalysts, solvents, energy, plastics etc.) that possess tremendous potential in reducing waste.
- Creatively redesign traditional experiments with a green focus (using the various principles of green chemistry).
- Learn about the green trends being practiced in pharmaceutical industries through depiction of some interesting industrial case studies.

## 22.4 Skill Enhancement Courses (Same for Physical Sciences with Chemistry)

### SEC-1 - IT Skills For Chemists

- Become familiar with the use of computers.
- Use software for tabulating data, plotting graphs and charts, carry out statistical analysis of the data.
- Solve chemistry problems and simulate graphs.
- Prepare documents that will incorporate chemical structure, chemical equations, mathematical expressions from chemistry.

### SEC-2 - Basic Analytical Chemistry

- Handle analytical data.
- Determine composition and pH of soil, which can be useful in agriculture.
- Do quantitative analysis of metal ions in water.
- Separate mixtures using separation techniques

### SEC-3 - Chemical Technology and Society

- Understand the use of basic chemistry to chemical engineering.
- Learn about chemicals.
- Learn about the use of various chemical technology used in industries.
- Develop scientific solutions for societal needs.

### SEC-4 - Chemoinformatics

- Have a comprehensive understanding of drug discovery process.
- Learn about the techniques including structure-activity relationship, quantitative structure activity relationship.
- Learn about the se of chemoinformatics including molecular modelling and docking studies.
- Appreciate role of modern computation techniques in the drug discovery process and perform their own modelling studies.

### SEC-5 - Business Skills for Chemists

- Learn basics skills of business and project management.
- Understand the process of product development and business planning that includes environmental compliancy.
- Learn the process by which technical innovations are conceived and converted into successful business ventures.
- Understand the intellectual property rights and patents which drive business viability and commercialization of innovation.

### SEC-6 - Intellectual Property Rights

- Learn theoretical concepts of evolution of Intellectual Property Laws, and to differentiate between the different kinds of IP.
- Know the existing legal framework relating to IP in India.
- Comprehend the value of IP and its importance in their respective domains.
- This course may motivate the students to make their career in multifaceted field of intellectual property rights.

### SEC-7 - Analytical Clinical Biochemistry

- Understand and establish how the structure of biomolecules determines their reactivity and biological uses.
- Understand the basic principles of drug-receptor interaction and structure activity relation (SAR).
- Gain an insight into concept of heredity through biological processes like replication, transcription and translation.
- Demonstrate an understanding of the biochemistry of diseases.

### SEC-8 - Green Methods in Chemistry

- Get idea of toxicology, environmental law, energy and the environment.
- Think to design and develop materials and processes that reduce the use and generation of hazardous substances in industry.
- Think of chemical methods for recovering metals from used electronics materials.
- Get ideas of innovative approaches to environmental and societal challenges.

### SEC-9 - Pharmaceutical Chemistry

- Gain insight into retro-synthesis approach in relation to drug design.
- Learn about drug discovery.
- Learn synthetic pathways of major drug classes.
- Understand the fermentation process and production of ethanol, citric acids, antibiotics and some classes of vitamins.

### SEC-10 - Chemistry of Cosmetics and Perfumes

- Learn basic of cosmetics.
- Learn about cosmetic formulation, ingredients and their roles in cosmetic products.
- Learn the use of safe, economic and body-friendly cosmetics.

- Prepare new innovative formulations.

### SEC-11 - Pesticide Chemistry

- Students will be able to learn about the basic role of pesticide in everyday life, various ingredients.
- They will learn about their role in controlling the pest.
- Students can also educate the farmers/gardeners to choose the appropriate pesticides for their crop production.
- Students can also guide farmers about composition of pesticides.

### SEC-12 - Fuel Chemistry

- The course covers both conventional petroleum-based fuels, and alternative & renewable fuels, including gaseous fuels.
- The students will learn the chemistry that underpins petroleum fuel technology, will understand the refining processes used to produce fuels and lubricants and will know how differences in chemical composition affect properties of fuels and their usage in different applications.
- The course will also cover origin of petroleum, crude oil, composition, different refining processes employed industrially to obtain different fractions of petroleum. Further, course will cover various alternative and renewable fuels like Biofuels (Different generations), Gaseous Fuels (e.g. CNG, LNG, CBG, Hydrogen etc.).
- The course will also cover fuel product specifications, various test methods used to qualify different types of fuels as well characterization methods.

## 23. B. Sc (H) BOTANY

### 23.1 Core Courses

### Microbiology and Phycology

- Students would have understanding of the classification, characteristic features, cell structure.
- Students will learn about growth and reproduction in viruses.
- Students will learn about growth and reproduction in bacteria and various groups of marine and freshwater algae.
- They will also understand their ecological and economic importance.

### Biomolecules and Cell Biology

- The relationship between the properties of macromolecules, their cellular activities and biological responses.
- Understanding of Cell metabolism and chemical composition.
- Understanding physicochemical and functional organization of organelle.
- Contemporary approaches in modern cell and molecular biology.

## Mycology and Phytopathology

- Understand the world of fungi, lichens and pathogens of plants.
- Appreciate the characteristics of the fungi and lichens.
- Understand the ecological and economic significance of lichen.
- Understand the application of mycology in various fields of economic and ecological significance.
- Understand the economic and pathological importance of fungi, bacteria and viruses.
- Identify common plant diseases and their control measures

## Archegoniate

- The students will be made aware of the group of plants that have given rise to land habit and the flowering plants.
- Through field study they will be able to see these plants grow in nature and become familiar with the biodiversity.
- Students should create their small digital reports where they can capture the zoomed in and zoomed out pictures.
- Students will also take videos in case they are able to find some rare structure or phenomenon related to these plants.

## Anatomy of Angiosperms

- Knowledge of various cells and tissues, meristem, epidermal and vascular tissue system in plants.
- Various aspects of growth, development of the tissues and differentiation of various plant organs.
- Knowledge of basic structure and organization of plant parts in angiosperms.
- Correlation of structure with morphology and functions.

## Economic Botany

- After studying Economic Botany, students would have first-hand information of plants used as food, the various kinds of nutrients available in the plants.
- The dietary requirements of proteins, fats, amino-acids, vitamins etc that can be met by plants. The students will learn to perform the micro-chemical tests to demonstrate various components.
- The students will learn about the use of fibre plants, beverages, fruits and vegetables that are integral to day-to-day life of plants.
- Students will learn to explore the regional diversity in food crops and other plants and their ethno-botanical importance as well.

## Genetics

- To generate interest among the students in Genetics.
- It will make them aware about the importance and opportunities in higher education and research.

- The first unit should be Introductory dealing with how this area has revolutionised all aspects of our life from its growth from Mendel to Genetic Engineering.
- Modes of inheritance of traits/ phenotypes and Phenotype-genotype correlation are the basic learning.

## Molecular Biology

- Understanding of nucleic acid, organization of DNA in prokaryotes and Eukaryotes.
- Understanding of DNA replication mechanism, genetic code and transcription process.
- Processing and modification of RNA and translation process, function and regulation of expression.
- Application in biotechnology

## Ecology

- It acquaints the students with complex interrelationship between organisms and environment.
- It will make them understand methods to studying vegetation, community patterns and processes, ecosystem functions.
- They will learn about principles of phytogeography.
- This knowledge is critical in evolving strategies for sustainable natural resource management and biodiversity conservation.

## Plant Systematics

- Understanding of systematics.
- Its importance in bioresource utilisation.
- Its role in biodiversity management.
- They will understand nomenclature pattern, Phylogeny, Classification systems of the plants.

## Reproductive Biology of Angiosperms

- Induction of flowering and molecular and genetic aspects of flower development.
- Pollen development, dispersal and pollination.
- Ovule development and fertilisation, Endosperm development and its importance alternation pathways of reproduction.
- Student would be able to apply this knowledge for conservation of pollinators and fruit development

## Plant Physiology

- The students are able to correlate morphology, anatomy, cell structure and biochemistry with plant functioning.
- The link between theory and practical syllabus is established.
- The employability of youth would be enhanced.
- The youth can also begin small-scale enterprises.

### Plant Metabolism

- Concept and significance of metabolic redundancy in plants.
- Students will also be able to learn the similarity and differences in metabolic pathways in animals and plants.
- To have understanding of water and nutrient uptake and movement in plants, role of mineral elements, translocation of sugars.
- Role of various plant growth regulators, phytochrome cytochromes and phototropins, and flowering stimulus will also be taught.

### Plant Biotechnology

- Learn the basic concepts, principles and processes in plant biotechnology.
- Have the ability of explanation of concepts, principles and usage of the acquired knowledge in biotechnological, pharmaceutical, medical, ecological and agricultural applications.
- Use basic biotechnological techniques to explore molecular biology of plants
- Explain how biotechnology is used to for plant improvement and discuss the biosefty concern and ethical issue of that use.

## 23.2 Discipline Specific Elective Courses

### Analytical Techniques in Plant Sciences

- Understanding of principles and use of light.
- They will learn confocal transmission and electron microscopy.
- Students understand centrifugation, spectrophotometry and chromatography.
- Students will learn x-ray diffraction technique and chromatography techniques

### Bioinformatics

- With a working knowledge of the practical concepts of bioinformatics, you will be well qualified to progress onto advanced graduate study.
- They will learn about theoretical concepts of bioinformatics.
- The portfolio of skills developed on the programme is also suited to academic research.
- Students work within the bioinformatics industry as well as range of commercial settings.

### Biostatistics

- Understanding of interpreting the scientific data that is generated during scientific experiments.
- It is the responsibility of biostatisticians and other experts to consider the variables in subjects to understand them, and to make sense of different sources of variation.
- In essence, the goal of biostatistics is to disentangle the data received and make valid inferences that can be used to solve problems in public health.
- Biostatistics uses the application of statistical methods to conduct research in the areas of biology, public health, and medicine.
- Many times, experts in biostatistics collaborate with other scientists and researchers.

### Industrial and Environmental Microbiology

- Understand how microbiology is applied in manufacturing of industrial products.
- Know about design of bioreactors, factors affecting growth and production.
- Understand the rationale in medium formulation & design for microbial fermentation, sterilisation of medium and air.
- Comprehend the different types of fermentation processes.
- Comprehend the techniques and the underlying principles in upstream and down-stream processing.
- Learn the occurrence, abundance and distribution of microorganism in the environment and their role in the environment and also learn different methods for their detection.
- Understand various biogeochemical cycles – Carbon and Nitrogen, and microbes involved.
- Understand the basic principles of environment microbiology and application of the same in solving environmental problems – waste water treatment and bioremediation.
- Comprehend the various methods to determine the quality of water

### Natural Resource Management

- It acquaints the students with various Natural Resources- their availability, causes of depletion, conservation, sustainable utilization and their management strategies.
- The students will be able to evolve strategies for sustainable natural resources management.
- The students will also have the knowledge of national and international initiatives.
- They will learn about the policies adopted in natural resources management.

### Plant Breeding

- Student would be able to understand the experimental steps involved in generating new varieties using classical breeding practices.
- Student would also understand the experimental methods involved in generating new varieties using classical breeding practices.
- Student would be able to understand the experimental steps involved in generating new varieties using contemporary breeding practices.
- Student would also understand the experimental methods involved in generating new varieties using contemporary breeding practices.

## 23.3 Generic Elective Courses

### Biodiversity (Microbes, Fungi, Algae and Archegoniate)

- Combination of Theoretical and Practical components will provide comprehensive information and insight into the fascinating world of Microbes and Plants.
- Hands on Training will help students learn use of microscope, mounting, section-cutting and staining techniques for the study of plant materials.
- Making Drawings in Practical Records will enhance understanding morphological and structural details and related functional aspects in diverse plant groups.

- Use of Illustrations, Photographs, Charts, Permanent Slides, Museum and Herbarium Specimens along with ICT Methods will provide an interesting insight into the beautiful world of microbes and plants.
- Scope of Biodiversity includes Medicinal field, Industry, Agriculture, Research and Study, Job Opportunities and Environmental Conservation. This paper is both informative and interesting and will enable students to learn about Biodiversity not only as a plant or nature lover, but also for higher academic pursuits, particularly in the field of Biological Sciences, Environment and Biodiversity Conservation.

## Economic Botany and Biotechnology

- Understanding of morphology.
- Leaning about processing and economic value of plant sources of cereals and legumes
- They also learn about spices, oil and rubber.
- They understand the making of timber and medicines

## Environmental Biotechnology

- Explain the various global and regional environmental concerns due to natural causes and/or human activities.
- Investigate some examples of different types of environmental pollution and their impacts.
- Describe existing and emerging technologies that are important in the area of environmental biotechnology.
- Demonstrate an awareness of emerging concerns such as climate change, waste management or reductions in fossil fuels, and new technologies for addressing these.
- Appreciate the scientific, ethical and/or social issues associated with certain applications of biotechnology for alleviating the environmental concerns.
- Explain national and international legislations, policies and role of public participation in Environmental Protection.
- Students will have an insight on the causes and consequences of environmental pollution, pollutants.
- They can think about the prevent of degradation of environment and management of pollutants.

## Plant Anatomy and Embryology

- Knowledge regarding anatomy equipped the students to identify different types of tissues and make them able to correlate their physiology in a better way.
- This will also help them to understand how different plant tissues evolve.
- Modify their structure and functions with respect to their environment.
- Knowledge regarding embryology make them understand how reproduction play significant role in defining population structure, natural diversity and sustainability of ecosystem in a better way.

## Plant Ecology and Taxonomy

- After successful completion of the course the student shall have adequate knowledge about the basic principles of environment and taxonomy.

- Students shall have adequate knowledge about the basic principles of taxonomy.
- They will learn about the interplay of plant ecology and taxonomy.
- They will also understand about the best practices which are environment friendly.

### Plant Physiology and Metabolism

- The students are able to correlate morphology.
- They will learn about anatomy, cell structure and biochemistry with plant functioning.
- The link between theory and practical syllabus is established.
- The employability of youth would be enhanced. The youth can also begin small-scale enterprises.

## 23.4 Skill-Enhancement Elective Courses

### Ethnobotany

- Students would have an understanding of the treasure and value of natural resources.
- Students learn about the usefulness of the natural products.
- How is it used efficiently by the local communities as food and medicine.
- They learn about conservation practices also.

### Floriculture

- Students would be able to identify the ornamental plants.
- They will have an understanding of cultivation methods.
- They will have an understanding of landscaping.
- They will have an understanding in making flower arrangement.

### Intellectual Property Rights

- Students would have a deep understanding of patents, copyrights, and their importance.
- They can think about the importance of traditional knowledge, bio-prospecting, and biopiracy.
- They would gain the knowledge of farmers rights.
- They would learn the importance of indigenous plant varieties, concept of novelty and biotechnological inventions

### Medicinal Botany

- To develop an understanding of the constraints in promotion of medicinal plants.
- To develop an understanding of the constraints in marketing of medicinal plants.
- Transforming the knowledge into skills for promotion of traditional medicine.
- Developing entrepreneurship skills to establish value addition products, botanical extracts and isolation of bioactive compounds.

### Mushroom Culture Technology

- Students learn the techniques about mushroom cultivation.
- Small scale and large-scale industries can be established by the students.
- Hand on experience will be given to students so they can utilise this training in the long run.
- In small areas also they can establish the business.

### Nursery and Gardening

- How is the nursery of the plants prepared?
- How rooting is promoted in the stem cuttings?
- How seeds are stored and what are the soil conditions for seed sowing and seedling growth?
- How is landscaping designed?

### Plant Diversity and Human welfare

- The students would be able to judge the value of biodiversity.
- They would know its role in stabilising the climate and economy.
- They would know the causes and consequences of loss of biodiversity.
- They will also learn about planning of conservation strategies.

## 24. B. Sc (H) PHYSICAL SCIENCE WITH CHEMISTRY

### 24.1 Core Courses

### Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons

- Solve the conceptual questions using the knowledge gained by studying the quantum mechanical model of the atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals, and periodicity in atomic radii, ionic radii, ionisation energy and electron affinity of elements. • Draw the plausible structures and geometries of molecules using radius ratio rules, VSEPR theory and MO diagrams (homo- & hetero-nuclear diatomic molecules).
- Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt.
- Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
- Learn and identify many organic reaction mechanisms including free radical substitution, electrophilic addition and electrophilic aromatic substitution.

### Chemical Energetics, Equilibria and Functional Group Organic Chemistry-I

- Understand the laws of thermodynamics, thermochemistry and equilibria.
- Understand the concept of pH and its effect on the various physical and chemical properties of the compounds.

- Use the concepts learnt to predict feasibility of chemical reactions and to study the behaviour of reactions in equilibrium.
- Understand the fundamentals of functional group chemistry through the study of methods of preparation, properties and chemical reactions with underlying mechanism.
- Use concepts learnt to understand stereochemistry of a reaction and predict the reaction outcome.
- Design newer synthetic routes for various organic compounds.

### Solutions, Phase Equilibrium, Conductance, Electrochemistry and Functional Group Organic Chemistry-II

- Explain the concepts of different types of binary solutions-miscible, partially miscible and immiscible along with their applications.
- Explain the thermodynamic aspects of equilibria between phases and draw phase diagrams of simple one component and two component systems.
- Explain the factors that affect conductance, migration of ions and application of conductance measurement.
- Understand different types of galvanic cells, their Nernst equations, measurement of emf, calculations of thermodynamic properties and other parameters from the emf measurements.
- Understand and demonstrate how the structure of biomolecules determines their chemical properties, reactivity and biological uses.
- Design newer synthetic routes for various organic compounds

### Chemistry of s- and p-Block Elements, States of Matter and Chemical Kinetics

- Understand the chemistry and applications of s- and p-block elements.
- Derive ideal gas law from kinetic theory of gases and explain why the real gases deviate from ideal behaviour.
- Explain Maxwell-Boltzmann distribution, critical constants and viscosity of gases.
- Explain the properties of liquids especially surface tension and viscosity.
- Explain symmetry elements, crystal structure specially NaCl, KCl and CaCl.
- Define rate of reactions and the factors that affect the rates of reaction.
- Understand the concept of rate laws e.g., order, molecularity, half-life and their determination.
- Learn about various theories of reaction rates and how these account for experimental observations.

## 25. B. Sc (H) PHYSICAL SCIENCE WITH ELECTRONICS

### 25.1 Core Courses

### CC-1B: Network Analysis and Analog Electronics

- To understand the concept of voltage and current sources, Network theorems, Mesh and Node Analysis.

- To develop an understanding of the basic operation and characteristics of different type of diodes and familiarity with its working and applications.
- Become familiar with Half-wave, Full-wave centre tapped and bridge rectifiers. To be able to calculate ripple factor and efficiency.
- To be able to recognize and explain the characteristics of a PNP or NPN transistor.
- Become familiar with the load-line analysis of the BJT configurations and understand the hybrid model (h- parameters) of the BJT transistors.
- To be able to perform small signal analysis of Amplifier and understand its classification.
- To be able to perform analysis of two stage R-C coupled Amplifier.
- To understand the concept of positive and negative feedback along with applications of each type of feedback and the working of Oscillators.
- To become familiar with construction, working and characteristics of JFET and UJT.

### CC-2B: Linear and Digital Integrated Circuits

- To understand Op- Amp basics and its various applications.
- To become familiar with number systems and codes, Logic Gates, Boolean Algebra Theorems.
- To understand the minimization techniques for designing a simplified logic circuit.
- To design a half Adder, Full Adder, Half-Subtractor, Full-Subtractor.
- To understand the working of Data processing circuits Multiplexers, Demultiplexers, Decoders, Encoders.
- To become familiar with the working of flip-flop circuits, its working and applications.

### CC-3B: Communication Electronics

- The concepts of electronics in communication, introduction to the principle, performance and applications of communication systems.
- Various means and modes of communication, electromagnetic communication spectrum with an idea of frequency allocation for radio communication system in India.
- An insight on the use of different modulation and demodulation techniques used in analog communication.
- Analyse different parameters of analog communication techniques.
- Learn the generation and detection of a signal through pulse and digital modulation techniques and multiplexing.
- In-depth understanding of different concepts used in a satellite communication system, Mobile radio propagation, cellular system design and understand mobile technologies like GSM and CDMA, mobile communication generations 2G, 3G, and 4G with their characteristics and limitations.

### CC-4B: Microprocessor and Microcontroller

- Designing and developing embedded systems.
- Major components that constitute an embedded system.
- The architecture of a 8085 Microprocessor.
- Assembly language programming essentials a microcontroller, microcomputer embedded system.
- The architecture of a 8051 microcontroller and its concepts like I/O operations, interrupts, programming of timers and counters.
- Interfacing of 8051 microcontroller with peripherals.
- Implementing small programs to solve well-defined problems on an embedded platform.

## 25.2 Discipline Specific Elective Papers

### DSE-1B: Semiconductor Devices Fabrication

- Learn to distinguish between single crystal, polycrystalline and amorphous materials based on their structural morphology and learn about the growth of single crystals of silicon, using Czocharalski technique, on which a present-day electronics and IT revolution is based.
- Students will understand about the various techniques of thin film growth and processes.
- Gain knowledge about characteristics of semiconductor devices (p-n junction diode, MOS, MOSFET, TUNNEL diode).
- Understanding of characteristics of Volatile and Non-Volatile memory element and their classifications.
- Appreciate the various VLSI fabrication technologies and learn to design the basic fabrication process of R, C, P- N Junction diode, BJT, JFET, MESFET, MOS, NMOS, PMOS and CMOS technology.
- Gain basic knowledge on overview of MEMS (Micro-Electro-Mechanical System) and MEMS based transducers.

### DSE-1B: Electronic Instrumentation

- Basic principles of the measurement and errors in measurement, specifications of basic Measurement instruments and their significance with hands on mode.
- Principles of voltage measurement, advantages of electronic voltmeter over conventional multi-meter in terms of sensitivity etc.
- Measurement of impedance using bridges, Power supply, Filters, IC regulators and Load and line regulation.
- Specifications of CRO and their significance, the use of CRO and DSO for the measurement of voltage (dc and ac), frequency and time period.
- Multivibrators, working circuits of Astable and monostable multivibrators. Phase Locked Loop (PLL), Voltage controlled oscillators and lock-In amplifier.
- Explanation and specifications of Signal and pulse Generators. the Interfacing techniques, Audrino microcontroller & interfacing software, Understanding and usage of Transducers.

### DSE-1B: Digital Signal Processing

- Students will learn basic discrete-time signal and system types, convolution sum, impulse and frequency response concepts for linear time-invariant (LTI) systems.
- The student will be in position to understand use of different transforms and analyse the discrete time signals and systems.
- They will learn to analyse a digital system using z- transforms and discrete time Fourier transforms, region of convergence concepts, their properties and perform simple transform calculations.
- The student will realize the use of LTI filters for filtering different real world signals. The concept of transfer Function and difference-Equation System will be introduced. Also, they will learn to solve Difference Equations.
- Students will develop an ability to analyse DSP systems like linear-phase, FIR, IIR, All- pass, averaging and notch Filter etc.
- Students will be able to understand the discrete Fourier transform (DFT) and realize its implementation using FFT techniques.

- Students will be able to learn the realization of digital filters, their structures, along with their advantages and disadvantages. They will be able to design and understand different types of digital filters such as finite & infinite impulse response filters for various applications.

### DSE-2B: Verilog and FPGA based system Design

- Understand the steps and processes for design of logic circuits and systems.
- Be able to differentiate between combinational and sequential circuits.
- Be able to design various types of state machines.
- Be able to partition a complex logic system into elements of data-path and control path.
- Understand various types of programmable logic building blocks such as CPLDs and FPGAs and their trade-offs.
- Be able to write synthesizable Verilog code.
- Be able to write a Verilog test bench to test various Verilog code modules.
- Be able to design, program and test logic systems on a programmable logic device (CPLD or FPGA) using Verilog.

### DSE-2B: Photonic devices and Power Electronics

- Develop understanding of application of fundamental laws of physics in such optoelectronics areas as telecommunications and power electronics for automation in industries.
- Acquire essential laboratory skills in designing experiments, assembling standard optical tools for optical experimentation and power electronics and analysing acquired data.
- Identify the critical areas in application levels and derive typical alternative solutions, select suitable power converters to control Electrical Motors and other industry grade apparatus.
- Develop understanding to compare performance and basic operation of various power semiconductor devices, passive components and various switching circuits.
- Develop understanding of Basic circuit of power rectifiers and inverters.

### DSE-2B: Antenna Theory and wireless Network

- Identify basic antenna parameter (Radiating wire Structures).
- Determine directions of maximum signal radiations and the nulls in the radiation patterns.
- Design array antenna systems from specifications.
- Identify the characteristics of radio-wave propagation.
- Identify Wireless Networks 4G and LTE, and 5G.
- Design Cellular Systems.

### DSE-2B: Dissertation

- Exposure to research methodology.
- Picking up skills relevant to dissertation project, such as experimental skills in the subject, computational skills, etc.
- Development of creative ability and intellectual initiative.
- Developing the ability for scientific writing becoming conversant with ethical practices in acknowledging other sources, avoiding plagiarism, etc.

## 25.3 Skill Enhancement Courses

### SEC 1: Computational Physics Skills

- Use computers for solving problems in Physics.
- Prepare algorithm and flowchart for solving a problem.
- Use Linux commands on terminal.
- Use an unformatted editor to write sources codes.
- Learn “Scientific Word Processing”, in particular, using LaTeX for preparing articles, papers etc. which include mathematical equations, picture and tables.
- Learn the basic commands of Gnuplot .

### SEC 2: Electrical Circuits and Network Skills

- Demonstrate good comprehension of basic principles of electricity including ideas about voltage, current and resistance.
- Develop the capacity to analyse and evaluate schematics of power efficient electrical circuits while demonstrating insight into tracking of interconnections within elements while identifying current flow and voltage drop.
- Gain knowledge about generators, transformers and electric motors. The knowledge would include to interfacing aspects and consumer defined control of speed and power.
- Acquire capacity to work theoretically and practically with solid-state devices.
- Delve into practical aspects related to electrical wiring like various types of conductors and cables, wiring-Star and delta connections, voltage drop and losses.
- Measure current, voltage, power in DC and AC circuits acquire proficiency in fabrication of regulated power supply.
- Develop capacity to identify and suggest types and sizes of solid and stranded cables, conduit lengths, cable trays, splices, crimps, terminal blocks and solder.

### SEC 3: Renewable Energy and Energy Harvesting

- Knowledge of various sources of energy for harvesting.
- Understand the need of energy conversion and the various methods of energy storage.
- A good understanding of various renewable energy systems, and its components.
- Knowledge about renewable energy technologies, different storage technologies, distribution grid, smart grid including sensors, regulation and their control.
- Design the model for sending the wind energy or solar energy plant.
- The students will gain hand on experience of: different kinds of alternative energy sources, conversion of vibration into voltage using piezoelectric materials, conversion of thermal energy into voltage using thermoelectric modules.

### SEC 4: Engineering Design and Prototyping/Technical Drawing

- Understanding the concept of a sectional view – visualizing a space after being cut by a plane. How The student will be able to draw and learn proper techniques for drawing an aligned section.
- Understanding the use of spatial visualization by constructing an orthographic multi view drawing.
- Drawing simple curves like ellipse, cycloid and spiral, Orthographic projections of points, lines and of solids like cylinders, cones, prisms and pyramids etc.
- Using Computer Aided Design (CAD) software and AutoCAD techniques.

## SEC 5: Applied Optics

- Understand basic lasing mechanism qualitatively, types of lasers, characteristics of laser light and its application in developing LED, Holography.
- Gain concepts of Fourier optics and Fourier transform spectroscopy.
- Understand basic principle and theory of Holography.
- Grasp the idea of total internal reflection and learn the characteristics of optical fibres.

## SEC 6: Weather Forecasting

- Acquire basic knowledge of the elements of the atmosphere, its composition at various heights, variation of pressure and temperature with height.
- To learn basic techniques to measure temperature and its relation with cyclones and anti- cyclones.
- Knowledge of simple techniques to measure wind speed and its directions, humidity and rainfall.
- Understanding of absorption, emission and scattering of radiations in atmosphere; Radiation laws.
- Knowledge of global wind systems, jet streams, local thunderstorms, tropical cyclones, tornadoes and hurricanes.
- Knowledge of climate and its classification. Understanding various causes of climate change like global warming, air pollution, aerosols, ozone depletion, acid rain.
- Develop skills needed for weather forecasting, mathematical simulations, weather forecasting methods, types of weather forecasting, role of satellite observations in weather forecasting, weather maps etc. Uncertainties in predicting weather based on statistical analysis.
- Develop ability to do weather forecasts using input data.
- In the laboratory course, students should be able to learn: Principle of the working of a weather Station, Study of Synoptic charts and weather reports, Processing and analysis of weather data, Reading of Pressure charts, Surface charts, Wind charts and their analysis.

## SEC 7: Introduction to Physical Computing

- Understand the evolution of the CPU from microprocessor to microcontroller and embedded computers from a historical perspective.
- Operate basic electronic components and analog and digital electronics building blocks including power supply and batteries.
- Use basic laboratory equipment for measurement and instrumentation.
- Understand the Arduino ecosystem and to write simple Arduino programs (sketches).
- Understand sensor characteristics and how to select a suitable sensor for various applications.
- Read digital and analog data and produce digital and analog outputs from an embedded computer.
- Understand how to interface an embedded computer to the physical environment.
- Visualize the needs of a stand-alone embedded computer and implement a simple system using Arduino.

## SEC 8: Numerical Analysis

- Approximate single and multi-variable function by Taylor's Theorem.

- Solve first order differential equations and apply it to physics problems.
- Solve linear second order homogeneous and non-homogeneous differential equations with constant coefficients.
- Calculate partial derivatives of function of several variables.
- Understand the concept of gradient of scalar field and divergence and curl of vector fields.
- perform line, surface and volume integration.
- Use Green's, Stokes' and Gauss's Theorems to compute integrals.
- Design, code and test simple programs in C++ learn Monte Carlo techniques, fit a given data to linear function using method of least squares find roots of a given non-linear function.
- Use above computational techniques to solve physics problems.

## 26. B.A (H) HINDI

### 26.1 Compulsory Language

#### BAHAECC01 – Hindi Bhasha aur Sampreshan

- Introducing the student to the nature and principles of communication.
- Knowledge of various mediums, the importance of effective communication.
- Preparing for employment-related fields, along with understanding the importance of effective communication.
- Students will also be able to write, read, read for different areas of employment.

### Compulsory Test in Hindi

#### CTH01 – Vartalap Tatha Devnagari Lipi

#### CTH01 – Vyavharik Vyakaran Tatha Rachna

### 26.2 Core Courses

#### BAHHCC01 – Hindi Bhasha Aur Uski Lipi Ka Itihash

- Through the above-mentioned course, the theoretical aspect of the Hindi language along with practical knowledge can be acquired.
- The important aspect of the role of the higher educational level of the Hindi language can be known.
- Practical knowledge of Hindi language can be obtained by connecting the computer to the Hindi language.
- In the global age, language must be combined with principles as well as practical.

#### BAHHCC02 – Hindi Kavita (Adikaal Evam Bhakti Kaleen kavya)

- Be well acquainted with the political, socio-cultural, religious conditions of the early times.

- Get acquainted with the contribution of Amir Khosrow in the field of literature and music in ancient times.
- BhaktiKal is the golden age of Hindi literature. Its study will develop human and moral values.
- BhaktiKal literature was opposed to the feudal system, this is a special achievement of this poetry.

### BAHHCC03 – Hindi Sahitya Ka Itihash (Adikaal Aur Madhyakaal)

- Knowledge of major historical texts.
- Knowledge of history of medieval period.
- Knowledge of history of Hindi literature, analysis of history texts.
- Method of making history.

### BAHHCC04 – Hindi Kavita (Ritikaleen Kavya)

- Study of Post Medieval Poetry will make you aware of the literary situation of the time.
- To give information about the study analysis of poetry in the socio-political-cultural background.
- You will get a special introduction to the post-medieval literature of Hindi.
- You will get a critical knowledge of the rich literature of Brajbhasha.

### BAHHCC05 – Hindi Sahitya Ka Itihash (Aadhunik Kaal)

- Introduction to the development of modern literature in the process of literary history Knowledge of the nature and purpose of literature.
- The relationship between literature and society and the importance of the study of literature for the identification of society and culture.
- One of the purposes of study of literature is to mark the pace and direction of the development of literature as well as the development of society.
- Without literary history, proper development and creation of literary conscience is not possible. Therefore, the study of literary history is necessary for the formation of literary conscience.

### BAHHCC06 – Hindi Kavita (Aadhunik Kaal Chhayawad Tak)

- Introduction to Modern Poetry Composition.
- Process and Analysis Study of prominent poets and their works Develop an understanding of Modern Poetry.
- Analysis of the relationship between literature and the contemporary environment.
- Developing an understanding of the reading, writing, analysis, and environment of poems.

### BAHHCC07 – Hindi Kahani

- Knowledge of the origin and development of Hindi story.
- Understanding of story analysis of the status of story in fiction.
- Analysis of the main stories and story writers.
- Introduction to Hindi fiction Story writing and analysis of the impact of the main storytellers and their understanding of the usefulness and analysis of story through story.

### BAHHCC08 – Bhartiya Kavya Shastra

- Knowledge of Sanskrit Poetry.
- Knowledge of rich tradition of Indian poetry.
- Presentation of Indian Poetry in modern Hindi criticism.
- Knowledge of Components of Poetry.

### BAHHCC09 – Hindi Kavita (Chhayawad Ke Bad)

- Through this course, students will be able to get in-depth information about Hindi poetry in the context of a particular period.
- How Hindi poetry can play an important role at higher educational level, this subject can be seriously known from this course.
- Along with learning poetry, students will also be able to know the ideological values.
- Beauty and art beauty can be known on both sides of the poem.

### BAHHCC10 – Hindi Upanyas

- Information about the origin and development of Hindi novels.
- Discussion of prominent writers and their novels.
- Fiction analysis method.
- Method of analysis of novel.

### BAHHCC11 – Pashchatya Kavya Shastra

- Developing an understanding of Western poetry.
- Developing an attraction to new dimensions of thought Moving towards a new understanding of literary.
- Coming from ancient to modernity, the understanding of western poetic thought-stream developing will be developed.
- Knowledge of new ideologies and literary will be gained.

### BAHHCC12 – Hindi Natak/Ekanki

- Will be able to understand the socio-political-cultural-literary-religious conditions of the era of the playwrights concerned.
- The sense of unity and social harmony of India will develop in the students.
- The feeling of women empowerment will get strengthened.
- Moral values will be developed. Sensitivity towards literature, art, nature, and environment will be developed.

### BAHHCC13 – Hindi Aalochana

- Theoretical and practical understanding of criticism will be developed in the students.
- The ability to analyse the composition will be developed.
- The merits and demerits of the composition will be able to be discussed.
- Critical conscience will be developed towards the composition and life.

### BAHHCC14 – Hindi Nibandh Aur Anya Gadhya Vidhyaen

- Knowledge of other prose genres.
- Analysis method Overview of selected works of major prose genres.
- Introduction to non-fiction literature.
- Analysis and understanding of the composition process and Introduction to key signatures.

## 26.3 Discipline Specific Elective Courses

### BAHHDSEC01 – Hindi Ki Maukhik Aur Laukik Parampara

- You will be able to get acquainted with the tradition of oral literature of Hindi.
- Study of folk literature tradition will get an opportunity to know Indian folk life closely.
- The folk stream of Indian life will be introduced.
- Interest in dance will develop.

### BAHHDSEC02 – Asmitamulak Vimarsh Aur Hindi Sahitya

- Theoretical and practical knowledge of identities Sensitive adjectives.
- Knowledge of identity discourse through the study of major works.
- Understanding the problems of different identities and its environment.
- Introduction to major works.

### BAHHDSEC 03 – Bhartiya Aur Pashchatya Rangmanch Siddhant

- Study analysis of important aspects of Indian and Western theatre.
- Relationship of drama theatre and introduction of new genres will be available, there will be dialogue with the performing arts.
- Will get an opportunity to get acquainted with different methods of theatre and their thinkers.
- Relationship of drama theatre and analysis of new genres will get the opportunity.

### BAHHDSEC 04- Hindi Bhasha Ka Vyavharik Vyakaran

- Hindi language is rapidly becoming globalized in the present time. Therefore, emphasis should be laid on the process of making the form of Hindi organized from the base itself. This course will be based on Hindi language.
- This course makes every effort to purify the linguistic form of the students.
- Critical ability will be developed in the students.
- The grammatical form of the Hindi language can be stabilized.

### BAHHDSEC 05- Kosh Vigyan: Sabdkosh Aur Vishvakosh

- Theoretical and practical knowledge of types of Kosh.
- Methods of construction, maintenance and use will be able to become familiar with the methods of type, construction, maintenance, and use.
- To Know the use of Kosh in work of Translation.
- To Know about the uses of Internet and computer in the making of e-Kosh.

### BAHHDSEC06 – Bhartiya Sahitya Ki Sanchhipt Roop-Rekha

- Introduction to India's Geographical, Linguistic and Cultural Diversity Understanding the Concept.
- Practicality of All India Literature.
- Understanding of All India Literature will develop.
- Understanding of cultural diversity in unity.

## BAHHDSEC07 – Loknatya

- Theoretical and practical information of Indian folk drama will be obtained from some major theatrical works.
- Analytical ability will be strengthened and there will be a dialogue between India-Brahma.
- There will be a dialogue between the theoretical and practical of Indian folk drama.
- Interest in tourism, folk-music, various theatrical forms will be awakened, there will be a dialogue between folk-feeling and India-realization.
- Theoretical and practical of Indian folk drama.

## BAHHDSEC08 – Hindi Ki Bhasik Vividhtayen

- Benefiting from prominent creators and productions.
- Analytical ability Developing an understanding of literature.
- Opportunity for interest in tourism.
- Dance-music etc.

## BAHHDSEC09 – Bhartiya Sahitya: Pathparak Adhyayan

- Introducing students to Indian literature.
- Knowledge of Indian literature.
- Helpful in personality development.
- Development of expression.

## BAHHDSEC10 – Sodh-Pravidhi

- To increase the awareness of research in the students.
- Will increase practical understanding of the nature of research.
- Understand the need for originality in research.
- Learn to design practical research.

## BAHHDSEC11 – Avadharnatmak Sahityik Pad

- Through this course, in the process of teaching-learning, a detailed knowledge of the words of Indian and Western criticism principles will be passed.
- The specific meaning of the terminology coming in the paradigms of literary criticism can be understood in detail.
- Through the adjectives of the definitional words, the student will be able to easily analyse the basic principles of these seed words and by passing the knowledge of conceptual words.
- The student will be able to easily analyse the criticality of criticism.

## BAHHDSEC12 – Hindi Rangmanch

- Along with the development of theatre, you will get information about different genres.
- Will be able to be aware of the vision of prominent thinkers.
- Will develop an understanding of traditional and modern theatre, India will develop.
- Bharat boadh will develop.

## 26.4 Generic Elective Courses

### BAHHGEC01 – Lokpriya Sahitya

- Will get information about the popular side of literature.
- Will be able to understand the need of popularity, popularity, and market,
- Will be able to observe the role of this side in creating the readership,
- Will be able to go closer to Indian popular and popular literature, which is the basis of the country's internal stream.

### BAHHGEC02 – Hindi Cinema aur Uska Adhyayan

- Knowledge of Hindi Cinema Understanding of critical thinking related to production.
- Broadcasting and consumption of cinema Understanding of Hindi cinema.
- Society and culture Practical understanding of cinema making.
- Dissemination and role of cameras etc.

### BAHHGEC03 – Rachnatmak Lekhan

- Developing creative skills in students.
- The development of creativity is helpful in getting employment in various fields like journalism, media, advertising, cinema, writing and arts etc.
- Will help you to learn to organize your ideas whether you are working on a short story, novel, play, or screenplay.
- Will help in improving your communication skills.

### BAHHGEC04 – Patkatha Tatha Samvad Lekhan

- Understand what the script is.
- Gain proficiency in script and dialogue writing.
- Will learn to adapt literary genres like story, novel etc. into screenplay.
- Will be able to make script writing a means of livelihood in the future.

### BAHHGEC05 – Hindi me Vyavharik Anuvad

- Develop an understanding of translation.
- Introducing practical and field-specific translation activities to develop employable.
- Translation skills be familiar with the demands of a specific area.
- The medium of knowing India's linguistic diversity.

### BAHHGEC06 – Bhasha aur Samaj

- Knowledge of Language and Society Interrelationship.
- Knowledge of Language Behaviour in Society.
- Skill Development for Successful Communication Course.
- Learning Outcomes Study of Sociolinguistics.

### BAHHGEC07 – Hindi Ka Vaishvik Paridhrishya

- Status of Hindi in Global Scenario Development and Challenges of Hindi.
- Introduction to International Status of Hindi.
- New Areas of Development.
- Achievements and Challenges.

### BAHHGEC08-Bhasha Shikshan

- To acquaint the student with the concept, importance, national, social, and educational contexts of language teaching.
- To familiarize the students with the basic concepts of language teaching.
- To introduce various linguistic skills under Hindi teaching.
- To give information about different methods and methods of language testing.

## 26.5 Skill Enhancement Courses

### BAHHSEC01 – Vigyapan aur Hindi Bhasha

- Knowledge of market.
- Advertising and commerce in Hindi Advertisement making.
- Dissemination and study of effect Analysis of advertisements of various mediums will get an opportunity to analyse the creation and impact on social needs.
- Ability to get employment in sectors.

### BAHHSEC02 – Computer Aur Hindi Bhasha

- The student will feel full of confidence by learning computer through Hindi medium.
- Through this course, in the process of teaching-learning, detailed information about the changing of Hindi language.
- Students will know about changes in computer from the initial level till now will be obtained.
- By learning different fonts of Hindi, one will be able to work easily on the computer.

### BAHHSEC03 – Social Media

- Development of social media as well as knowledge of language, Society, and culture.
- Code of conduct of social media.
- Various effects of social media Practical knowledge of market.
- Social media and society's relationship.

### BAHHSEC04 – Anuvad Kaushal

- Giving theoretical and practical knowledge of translation Course.
- Knowledge of the nature of translation in various fields.
- Theoretical and practical knowledge of translation.
- Analytical study of translation in various fields Experimental work.

## BAHHSEC05 – Karyalayi Hindi

- To provide knowledge of writing of official terminology/tea letter.
- Practice of translation from Hindi to English and from English to Hindi, formal knowledge of official communication and correspondence Course Learning Outcomes.
- Theoretical and practical knowledge of official language will be the requirements.
- Employment of Hindi forecasting the demand of the regions.

## BAHHSEC06 – Bhashayi Dakshata: Samajh Aur Sambhashan

- Language proficiency: will be exposed to many aspects related to comprehension and communication.
- And the understanding of many dimensions of speech, its importance, usage, extension, style, linguistic culture will be developed.
- Will be able to be aware of the correct pronunciation of the language, common writer, creative writing, and technical words.
- In addition to discussing grammatical forms, understand the practical form of language. You will also be able to study conversation, speech, book review, film review etc.

## BAHHSEC07 – Bhasha Aur Samaj

- Getting to know the language and community in the changing Indian environment.
- To analyse the various forms of language ethnicity, to be aware of the different forms of bilingualism and multilingualism and their contextual analysis.
- To acquire in-depth knowledge of the basic points of language and culture.
- Language survey, analysis of their various forms and language patterns and study of new use of language.