JAI HIND COLLEGE

BASANTSING INSTITUTE OF
SCIENCE & J.T. LALVANI
COLLEGE OF COMMERCE
AND
SHEILA GOPAL RAHEJA COLLEGE OF
MANAGEMENT **AUTONOMOUS**

Bachelor of Business Administration

BBA

(INDUSTRY INTEGRATED)

Program

In collaboration with

TATA CONSULTANCY SERVICES (TCS)

- PO1. Demonstrate an understanding of every dimension of business & to analyse the character of the future business environment.
- PO2. Propose and implement appropriate decisions in all areas of business management including finance, marketing, and operation.
- PO3. Demonstrate the diverse knowledge of business and corporate laws and their applicability in business, finance, and audit.
- PO4. Apply the competencies and creativity required to undertake entrepreneurship as a desirable and feasible career option.
- PO5. Develop broad-based business skills and knowledge, development of general and specific capabilities to meet the current and future expectations of the business, industry, and economy, at the national and global level.
- PO6. Appreciate the significance of sustainable development.
- PO7. Achieve higher levels of proficiency and self-actualization through the pursuit of life-long learning.
- PO8. Create, select, and apply appropriate techniques, resources, modern management to complex management activities with an understanding of the limitations.
- PO9. Exhibit the competencies required to undertake Business Process Management as a viable career option.
- PO10. Demonstrate adequate preparation for career development through the acquisition of a solid foundation in the ITES industry.
- PO11. Apply the competencies and creativity required to undertake Business Process Management as a desirable and feasible career option.

2022-23

	Semester III	
Course Code	**Course Title**	**Credits**
CBBA301	Entrepreneurship	4
CBBA302	Business Economics -II	3
CBBA303	Digital Marketing & E Commerce	3
CBBA304	**Finance and Accounting for BPS**	4
CBBA305	**Retail & Market Research**	4
CBBA306	**Insurance for BPS**	4
CBBA307	Corporate Finance	3

SEMESTER III – APPLICATION BASED LEARNING
SEM III: CBBA301: ENTREPRENEURSHIP

Course Objectives:

· To acquire necessary knowledge and skills required for organizing and carrying out entrepreneurial activities.

· To develop the ability of analysing and understanding business situations in which entrepreneurs act and to master the knowledge necessary to plan entrepreneurial activities.

· To develop the ability of analysing various aspects of entrepreneurship – especially of taking over the risk, and the specificities as well as the pattern of entrepreneurship development and, finally, to contribute to their entrepreneurial and managerial potentials.

Course: CBBA301	**Course Title: ENTREPRENEURSHIP (Credits: 04 Lectures/Week: 4L)**	
Unit I	**ENTREPRENEURIAL PERSPECTIVE** a) Entrepreneurial Ecosystem b) Features of Entrepreneur c) The Entrepreneur's role, Task & personality d) Entrepreneurship as a style of management e) Role of Entrepreneur in Economic Development f) Starting with a startup and growing into a business organization g) Rules and regulations for Startup India h) Typology of Entrepreneurs: Defining Survival & Success	**15 L**
Unit II	**CREATING & STARTING A VENTURE** a) Opportunity recognition and entry strategies b) Strategic Window of Opportunity: Scanning, Positioning and analyzing c) Intellectual property: Creation & Protection d) Legal Issues	**15 L**
Unit III	**THE BUSINESS PLAN- ENTREPRENEURIAL TOOL** a) Gathering the resources, Introduction to various sources of funds, angel investors and crowd-funding b) Information Needs: Market Information, Operation Information, Financial Information c) Writing Business plan with frugality-Marketing plan, Organizational plan, Execution plan d) Preparation of pitching documents e) Financial Plan and Forms of Financing f) Sources of External Support	**15 L**

Unit IV	**CREATION OF PROTOTYPE** a) Identifying Customer b) Creation of Minimum Viable product c) The changing role of an Entrepreneur d) Innovation and Disruption Management	**15 L**

References:

1.Robert Hisrich, Michael Peters, Dean Shepherd,2010, Entrepreneurship, Tata McGraw Hill, New Delhi.

2. Vasant Desai, 2009, Dynamics of Entrepreneurial Development Management -, Himalaya Publishing House Mumbai.

3. Justin G, J. William, 2003, Small business management: an entrepreneurial emphasis-, Thomson south western.

Course Outcome:

CO1. Gain understanding of the concepts of Entrepreneurship and their development in all forms and shapes.

CO2. Imbibe basics of entrepreneurial skills and competencies to provide the participants with necessary inputs for creation of new ventures and developing entrepreneurial behavior among students.

CO3. Understand the entrepreneurial process from idea generation, to concept development and creation of the venture.

CO4. Understand the entrepreneurial environment impacted by the social, economic, cultural & legal conditions.

CO5. Identify and develop opportunities for an entrepreneur in an uncertain and inflexible environment and ways and means to minimize the external threats.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓		✓	✓	✓	✓	✓	✓			✓
CO2	✓	✓	✓		✓	✓		✓			✓

CO3		✓	✓	✓		✓	✓	✓			✓
CO4		✓		✓	✓		✓		✓		✓
CO5	✓	✓	✓	✓		✓		✓	✓		✓

SEMESTER III – APPLICATION BASED LEARNING
SEM III: CBBA302: BUSINESS ECONOMICS -II

Course Objectives:

· To provide the student with knowledge of basic concepts of macroeconomics.

· To discuss and elaborate the modern tools of macro-economic analysis and policy framework, including the open economy.

· To provide a treatment of economic theory that is relevant to the real world with real world examples and case studies along with the study of economic models.

Course: CBBA302	**Course Title: BUSINESS ECONOMICS (Credits: 03 Lectures/Week: 4L)**	
Unit I	**INTRODUCTION TO MACRO ECONOMIC DATAAND THEORY** a) Macroeconomics: Meaning, Scope and Importance. (Only concepts to be covered) b) Circular flow of aggregate income and expenditure: closed and open economy models (Only Concepts to be covered) c) The Measurement of national product: Meaning and Importance - conventional and Green GNP and NNP concepts - Relationship between d) National Income and Economic Welfare. Problems in NationalIncome, Human Development Index, Gender Equality. e) Short run economic fluctuations: Features and Phases of TradeCycles (Brexit, Great Depression, EuroZone crisis – to be discussed) f) The Keynesian Principle of Effective Demand: Aggregate Demand and g) Aggregate Supply - Consumption Function - Investment function – effects of Investment Multiplier on Changes in Income and Output	**15 L**

Unit II	**MONEY INFLATION AND MONETARY POLICY** a) Money Supply: Determinants of Money Supply - Factors influencing Velocityof Circulation of Money b) Demand for Money: Classical and Keynesian approaches and Keynes' liquidity preference theory of interest c) Money and prices: Quantity theory of money - Fisher's equation of Exchange d) Inflation: Demand Pull Inflation and Cost Push Inflation - Effects ofInflation-Nature of inflation in a developing economy – Inflationary Gap &Stagflation. e) Monetary policy: Meaning, objectives and instruments, inflation targeting. Limitations (with relation / In context with Autonomy of Central Bank).	**15 L**
UNIT III	**CONSTITUENTS OF FISCAL POLICY** a) Role of a Government to provide public goods- Principles of Sound and Functional Finance b) Fiscal Policy: Meaning, Objectives - Contra cyclical Fiscal Policy and Discretionary Fiscal Policy c) Instruments of Fiscal Policy: Canons of taxation - Factors Influencing incidence of taxation - Effects of taxation Significance of Public d) Expenditure – Types & Effects of Public Expenditure, Theories of increase in Public Expenditure, Social Insurance Programmes	**15 L**

	e) Public Debt - Types, Public Debt and Fiscal Solvency, Burden of debt finance f) Union budget (Brief) -Structure- Deficit Concepts-Fiscal Responsibility and Budget Management Act.	

UNIT IV	**OPEN ECONOMY: THEORY AND ISSUES OF INTERNATIONAL TRADE** a) The basis of international trade: Ricardo's Theory of comparative cost advantage - The Heckscher – Ohlin theory of factor endowments- terms of trade - meaning and types (Barter & Income terms of trade) Factors determining termsof trade - Gains from trade - Free trade versus protection b) Foreign Investment: Concepts of FPI, FDI and relative importance. c) Balance of Payments: Structure -Types of Disequilibrium - Measures to correct disequilibrium in BOP. d) Foreign Exchange and foreign exchange market: Meaning, Functions & Players in the Exchange Market. Spot and Forward rate of Exchange - Hedging, Speculation and Arbitrage -Fixed and Flexible exchange rates- Managed flexibility e) Freight currency/ Digital currency f) Digital Finance and Digital Assets	**15 L**

References:

1. Case, Karl E. & Ray C. Fair, (2019), Principles of Macro Economics, 12e, Pearson India Publication. 2. Ahuja, H. L, (2019), Business Economics,13e, S.Chand Publishing House.
3. Mankiw, Gregory N. (2012), Principles of Macro Economics, Cengage India
4. A 100 Small Steps, by Raghuram Rajan
5. Dwivedi, D.N. (2010), Essentials of Business Economics, Pearson Education
6. Dornbusch, Rudiger, Stanley Fischer & Richard Startz, (2018), Macroeconomics, 12e, McGraw-Hill Education.
7. Roy, Shyamal, (2010), Macroeconomic Policy Environment: An Analytical Guide for Managers, 2e, Tata McGraw Hill Education Private Ltd.

COURSE OUTCOME

CO1. Understand how different sectors interact in macroeconomics.
CO2. Understand how national income is calculated.
CO3. Understand and evaluate the concept of the multiplier effect in an economy.
CO4. Analyse the money market.
CO5. Discover the Role of fiscal and monetary policy in macro economy.
CO6. Analyse the causes and impact of inflation and evaluate policies to control it.
CO7. Understand the role of economic policies in an open economy, Balance of payments, impact of capital
flows in an open economy.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11

CO1	✓	✓	✓	✓	✓	✓	✓	✓			✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓			✓
CO4	✓	✓		✓	✓		✓		✓		✓
CO5	✓	✓	✓	✓		✓		✓	✓		✓
CO6		✓		✓		✓		✓		✓	
CO7	✓	✓	✓	✓		✓		✓			✓

SEMESTER III – APPLICATION BASED LEARNING

SEM III: CBBA303: DIGITAL MARKETING & E-COMMERCE

Course Objectives:

· To understand the increasing significance of E–Commerce and its applications in Business and Various Sectors.

· To provide an insight on Digital Marketing activities on various SocialMedia platforms and its emerging significance in Business.

· To understand Latest Trends and Practices in E–Commerce and Digital Marketing, along with its Challenges and Opportunities for an Organisation.

Course: CBBA303	**Course Title: DIGITAL MARKETING AND E-COMMERCE (Credits: 03 Lectures/Week: 4L)**

UNIT I	**DIGITAL MARKETING** a) Introduction to Digital Marketing, Advantages and Limitations of Digital Marketing b) Elements of Digital Marketing, Difference between traditional and digital marketing c) Website designing d) Search Engine Optimisation e) Marketing automation f) Website Funnel Analytics g) Consumer analytics h) Company side analytics - Communication, engagement and actual lead on sale	**15 L**
UNIT II	**SOCIAL MEDIAAND CONTENT MARKETING** a) Facebook Content Strategy b) LinkedIn Content Strategy c) Instagram Content Strategy d) Twitter Content Strategy	**15 L**
UNIT III	**MEDIA PLANNING AND ADVERTISING** a) Programmatic Media Buying b) Social Media Advertising c) Search Advertising d) Lead generation e) Performance Marketing f) Influencer Marketing	**15 L**
UNIT IV	**E-COMMERCE** a) E-Commerce: Meaning, Features, Categories, Advantages, Limitations, Environmental Factors b) Introduction to selling on Amazon and other E-commerce stores c) Setting up your own E-commerce store d) Electronic Payment Systems- Payment Gateway: Process, Types	**15 L**

References:
1. D Nidhi (2011), E-Commerce Concepts and Applications, International Book house P.ltd 2. Bajaj KamleshK(2005),E-Commerce- The cutting edge of Business, New Delhi, Tata McGraw hill publishing company limited.
3. WhiteleyDavid(2013), E-Commerce Technologies and Applications , New Delhi, Tata McGraw hill publishing company limited.
4. E-Business & E-Commerce Management 3rd Ed, New Delhi, Pearson Education. 5. Kalokota & Robinson(2009),E-Business 2.0 Roadmap for Success, New Delhi, Pearson Education. 6. Elias M. Awad(2006),Electronic Commerce, 3rd Edition, New Delhi Pearson Education. 7. Erfan Turban et.al (2008),Electronic Commerce - A Managerial Perspective, ninth edition, New Delhi, Pearson Education.
8. Tripathi(2010), E-Commerce, Mumbai, Jaico Publishing House.

COURSE OUTCOME:

CO1.To understand the increasing significance of E-Commerce and its applications in Business and Various Sectors.

CO2. To Develop an insight on Digital Marketing activities on various SocialMedia platforms and its emerging significance in Business.

CO3.To apply Latest Practices in E-Commerce and Digital Marketing

CO4. To demonstrate skills in analyzing the Challenges and Opportunities for an Organisation.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3		✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4		✓		✓	✓		✓		✓	✓	✓

SEMESTER III – APPLICATION BASED LEARNING

SEM III: CBBA304: FINANCE AND ACCOUNTING FOR BPS

(TCS COURSE) C

Course: CBBA304	Course Title: FINANCE AND ACCOUNTING FOR BPS (Credits: 04 Lectures/Week: 4L)	60 Hours

Course Outcome:

CO1. To develop an understanding about business processes and the BPS industry.

CO2. To develop skills with reference to various accounting terms

and processes used.

CO3. To acquaint students with the emerging trends in F&A

technologies.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

SEMESTER III – APPLICATION BASED LEARNING

SEM III: CBBA305: RETAIL AND MARKET RESEARCH (TCS COURSE)

Course Objectives:

· To learn about Market Research and how they help manufacturers and retailers know what consumers buy, and what they see.

Course: CBBA305	RETAIL AND MARKET RESEARCH (Credits: 04 Lectures/Week: 4L)	60 Hours

Course Outcome;

CO1. Develop and apply understanding of market research tools and research methodologies

CO2. Demonstrate understanding of Consumer Goods Industry and its Classification

CO3. Develop insights of Key Consumer Research Methodologies, Key Consumer Research
CO4. Methodologies, and Stages of New Product Development
CO5. Demonstrate understanding of Panel Service and Media Research

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓		✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓		✓	✓

SEMESTER III – APPLICATION BASED LEARNING
SEM III: CBBA306: INSURANCE FOR BPS (TCS COURSE)

Course Objectives:
· To provide a brief introduction to the Basics of Insurance, concepts, terminologies, etc. · To give an insight into Life Insurance concepts, Annuity concepts & Group Insurance concepts, etc. · To give an insight into Property & Casualty insurance, non–life insurance concepts, etc. · To provide insights into healthcare insurance concepts and retirement services in the USA / UK, etc.

Course: CBBA306	Course Title: INSURANCE FOR BPS-I (Credits: 04 Lectures/Week: 4L)	60 Hours

Course Outcome

CO1. Develop understanding of the Basics of Insurance, concepts, terminologies, etc.
CO2. Demonstrate insights into Life Insurance concepts, Annuity concepts & Group Insurance
concepts, etc.
CO3. Develop insights into Property & Casualty insurance, non-life insurance concepts, etc.
CO4. Develop insights into Healthcare insurance concepts.
CO5. Understand Retirement services in the USA / UK, etc.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓		✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓		✓	✓

SEMESTER III – APPLICATION BASED LEARNING
SEM III: CBBA307: CORPORATE FINANCE

Course Objectives:

· The objectives of developing a conceptual framework of finance function and to acquaint the participants with the tools techniques and process of financial management in the realm of financial decision making · To providing understanding of nature, importance, structure of corporate finance related areas and to impart knowledge regarding source of finance for a business

Course: CBBA307	Course Title: CORPORATE FINANCE (Credits: 03 Lectures/Week: 4L)	
UNIT I	**INTRODUCTION** a) Introduction to Corporate Finance: Meaning, Principles of Corporate Finance, Significance of Corporate Finance, Amount of Capitalisation, Over Capitalisation and Under Capitalisation, Fixed Capital and Working Capital funds. b) Introduction to ownership securities– Ordinary Shares, Reference Shares, Creditorship Securities, Debtors and Bonds, Convertible Debentures, Concept of Private Placement of Securities c) Excess Liquidity management d) Financial risk management	**15 L**
UNIT II	**CAPITAL STRUCTURE AND LEVERAGE** a) Introduction to Capital Structure theories, cap gearing leverages, EBIT – EPS analysis for Capital Structure decision. b) Short term and long-term capital structure. c) Cost of Capital – Cost of Debt, Cost of Preference Shares, Cost of Equity d) Shares and Cost of Retained Earnings, Calculation of Weighted Cost of Capital e) Introduction to concept of Leverage - Operating Leverage, Financial Leverage and Combined Leverage f) Lease Financing g) Dupont Analysis	**15 L**
UNIT III	**TIME VALUE OF MONEY** a) Introduction to Time Value of Money – compounding and discounting. b) Introduction to basics of Capital Budgeting (time value of money based methods) – NPV and IRR (Net Present Value and Internal Rate of Return) c) Bond Pricing d) Importance of Risk and Return analysis tradeoff in Corporate Finance e) Impact on Income tax in Capital Structuring.	**15 L**

UNIT IV	**MOBILISATION OF FUNDS** a) Introduction to financial markets and sources of funds b) Public deposits and RBI regulations, Company deposits and SEBI regulations, Protection of depositors, RBI and public deposits with NBFCs c) Foreign capital and collaborations, Foreign direct Investment (FDI) d) Emerging trends in FDI e) Dollarization of funds f) Global Depositary Receipts, Policy development, Capital flows and Equity Debt g) Brief introduction & sources of short-term Finance Bank Overdraft, Cash Credit, Factoring h) Primary and secondary Capital markets	**15 L**

References:

1. Chandra, P, 2011.Corporate Valuation and Value Creation, (1e), Tata - McGraw Hill. 2. Foster, George, (2004), Financial Statement Analysis, 2e, Pearson Education Pvt Ltd. 3. Damodaran, A, (2008) Damodaran on Valuation, Security Analysis for Investment and Corporate Finance, Wiley India Pvt. Ltd.
4. Prasanna Chandra,2008- Financial Management, New Delhi, Tata - McGraw Hill. M.Y. Khan and P.K. Jain, 2005 - Financial Management, New Delhi, Tata - McGraw Hill Publishing Co.Ltd.

COURSE OUTCOME

CO1.Associate appropriate theories, principles and concepts relevant to managerial accounting practices.

CO2. Develop a critical argument to the solution of familiar and unfamiliar problems relevant to managerial accounting.

CO3. Plan, design and formulate practical activities using techniques and procedures appropriate to managerial accounting.

CO4.Apply methods, techniques and procedures of managerial accounting.

CO5.Solve problems relevant to managerial accounting using ideas and techniques some of which are at the forefront of the discipline.

CO6.Draw conclusions to assist top management in the decision-making process.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11

CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓		✓	✓
CO6	✓	✓	✓	✓	✓			✓	✓		✓

	Semester IV	
Course Code	**Course Title**	**Credits**
CBBA401	**Brand Management**	4
CBBA402	Strategic Management	4
CBBA403	**Managing Business Process-I**	3
CBBA404	**Capital Markets**	4
CBBA405	Taxation-I	3
CBBA406	**Banking for BPS**	4
CBBA407	Strategic Cost Management	3

SEMESTER IV – APPLICATION BASED LEARNING

SEM IV: CBBA401: BRAND MANAGEMENT

Course Objectives:

· To understand the meaning and significance of Brand Management.

· To Know how to build, sustain and grow brands.

· To know the various sources of brand equity.

Course: CBBA401	**Course Title: BRAND MANAGEMENT (Credits:04 Lectures/Week: 4L)**	
UNIT I	**INTRODUCTION TO BRAND MANAGEMENT** a) Meaning of Brand, Branding, Brand Management, Importance of Branding to Consumers, Firms, Brands v/s Products, Scope of Branding, Branding Challenges and Opportunities b) Strategic Brand Management Process, Customer Based Brand Equity model (CBBE) c) Sources of Brand Equity, Steps of Brand Building including Brand Building Blocks d) Brand Positioning: Meaning, Importance, Basis e) 24*7 brand management f) Brand management of technology brands, service brands	**15 L**
UNIT II	**PLANNING AND IMPLEMENTING BRAND MARKETING PROGRAMS** a) Planning and Implementing Brand Marketing Programs: b) Brand Elements: Meaning, Criteria for choosing Brand Elements, Types of Brand Elements 1) Integrating Marketing Programs and Activities c) Personalised Marketing: Experiential Marketing, One to One Marketing, Permission Marketing d) Product Strategy: Perceived Quality and Relationship Marketing e) Pricing Strategy: Setting Prices to Build Brand Equity f) Channel Strategy: Direct, Indirect Channels g) Promotion Strategy: Developing Integrated Marketing Communication Programs h) Leveraging Secondary Brand Associations to Build Brand Equity: Companies, Countries, i) Channel of Distribution, Co-branding, Characters, Events	**15 L**

UNIT III	**MEASURING AND INTERPRETING BRAND PERFORMANCE** a) The Brand Value Chain b) Measuring Sources of Brand Equity: c) Qualitative Research Techniques: Projective Techniques: Completion, Comparison, Brand Personality and Values: The Big Five, Free Association d) Quantitative Research Techniques: Brand Awareness: Recognition, Recall, Brand Image, Brand Responses, Young and Rubicam's Brand Asset Valuator, Measuring Outcomes of Brand Equity e) Comparative Methods: Brand based Comparative Approaches, Marketing Based Comparative Approaches, Conjoint Analysis f) Holistic Methods: Residual Approaches, Valuation Approaches: Historical Perspectives and Interbrand's Brand Valuation Methodology	**15 L**
UNIT IV	**GROWING AND SUSTAINING BRAND EQUITY** a) Designing & Implementing Branding Strategies: b) Brand Architecture: Meaning of Brand Architecture, The Brand-Product Matrix, of a Branding Strategy, Depth of a Branding Strategy, Digital Brand Management c) Brand Hierarchy: Meaning of Brand Hierarchy, Building Equity at Different Levels Cause Marketing to Build Brand Equity: Meaning of Cause Marketing	**15 L**

References:

1. Keller Kevin Lane, Strategic Brand Management: Building, Measuring and Managing Brand Equity 2. Keller Kevin Lane, Strategic Brand Management-2008
3. Elliot, Richard, Strategic Brand Management-2008
4. Kapferer, Jean-Noel, Strategic Brand Management-2000
5. Kishen, Ram, Strategic Brand Management- 2013
6. Keller Kevin Lane, Strategic Brand Management 4e-2015 Professor Shubroto Sen gupta

COURSE OUTCOME;

CO1. To examine the brand concepts in real-life setting by articulating the context and the rationale for the application.

CO2. Understand how a new product is developed and maintained.

CO3. List and describe the steps in the new-product development (NPD) process; describe how the NPD process meshes with the adoption and diffusion process for those products.

CO4.Enhance students' ability to apply creative and critical strategies and tactics involved in developing,

positioning, leveraging, managing a brand, and measuring its value.

CO5. Apply branding principles and marketing communication concepts and frameworks to achieve brand management goals and improve marketing performance.

CO6. After the completion of the course the students will be able to understand and analyze the Brand Portfolio of the companies. will be able to map out areas where the firm needs brand extension and cannibalization.

CO7.Develop a consumer-centric approach to building, measuring and evaluating strategies that build brand equity for new and existing brands

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓		✓	✓
CO6	✓	✓	✓	✓	✓			✓	✓		✓
CO7	✓		✓	✓	✓	✓	✓		✓		✓

SEMESTER IV – APPLICATION BASED LEARNING

SEM IV: CBBA 402: STRATEGIC MANAGEMENT

Course Objectives:

· To develop conceptual skills in different areas as well as their application in the corporate world. · To help students synthesize the factors in complex strategy and provide a professional framework for case analysis in terms of external & internal factors.

· To take the student through the generation of strategic alternatives and implementation.

Course: CBBA402	**Course Title: Strategic Management (Credits: 04 Lectures/Week: 4L)**	
UNIT I	**INTRODUCTION** a) Business Policy- Meaning, Nature & importance b) Strategy- Meaning and Importance of Strategy in Business Management c) Strategic Management-Meaning & Importance of Strategic management, Process & Levels of Strategy, Concept and importance of Strategic Business Units (SBU's) d) Scanning the business Environment	**15 L**
UNIT II	**STRATEGY FORMULATION** a) Situational Analysis and Business Strategy b) Corporate Level Strategy c) Directional Strategy d) Digital strategies, Lipstick strategy and Destination strategy e) Models of Strategy making - BCG Matrix, GE9 Cell, Porter's Five Forces, 7S framework, FAST, STOP, OGSM	**15 L**

UNIT III	**STRATEGY IMPLEMENTATION** a) Organising For Action- Staffing –Staffing Follows Strategy, Selection & Management Development b) Leading- Managing Corporate culture, Action Planning c) International Issues in Strategy Implementation	**15 L**
UNIT IV	**STRATEGY EVALUATION** a) Steps of Evaluation & Techniques of Control Strategic Information Systems b) Problems in Measuring Performance c) Other Strategic issues -Managing Technology & Innovation, d) Small Businesses & Entrepreneurial venture	**15 L**

References:

1. Thomas L. Wheelen, J. David Hunger (2016) Concepts in Strategic Management and Business Policy (14 e), Delhi, Pearson Education.
2. Ghosh P. K. (2013) Strategic Management- Text & Cases, New Delhi, Sultan Chand & Sons. 3. Frank T Rothaermel, (2012) loose-leaf for strategic Management: concepts and cases, Bengaluru, McGraw Hill Education.
4. David, Fred R. (2013), Strategic management Concepts & Cases: A competitive Advantage Approach, (14e), Prentice Hall India Learning Private Limited.
5. Stern, Carl W, Michael S. Deimler, (2006), "The Boston Consulting Group on Strategy: Classic Concepts and New Perspectives, (2e), Wiley Publication.
6. Porter, Michael E, W. Chan Kim, Renee A. Mauborgne, (2011), "HBR's 10 Must Reads on Strategy" (Featuring "What is Strategy?" by Harvard Business Review), 7e, Harvard Business Review Press.

COURSE OUTCOME

CO1.Understand the strategic decisions that organisations make and have an ability to engage in strategic planning.

CO2. Explain the basic concepts, principles and practices associated with strategy formulation and implementation.

CO3. Integrate and apply knowledge gained in basic courses to the formulation and implementation of strategy from holistic and multi-functional perspectives.

CO4. Analyze and evaluate critically real life company situations and develop creative solutions, using a

strategic management perspective.

CO5. Conduct and present a credible business analysis in a team setting.

CO6. Understand the organization environment and implement organization's strategy

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓		✓	✓		✓	✓
CO6	✓	✓	✓	✓	✓			✓	✓		✓

SEMESTER IV – APPLICATION BASED LEARNING

SEM IV: CBBA403: MANAGING BUSINESS PROCESS-I

(TCS COURSE)

Course Objectives:

· To provide understanding of Business processes, BPS Industry, Process Mapping Techniques and customer needs /Expectations.

· To provide an overview about Quality Management, QCVsQA, Need for First Pass Yield, Components of Cost of Quality.

Course: CBBA403	Course Title: MANAGING BUSINESS PROCESS-I (Credits: 03 Lectures/Week: 3L)	45 Hours

COURSE OUTCOME

CO1. Understanding of Business processes,BPS Industry,Process Mapping Techniques and customer needs /Expectations.

CO2. Demonstrate the application about Quality Management,QCVsQA,Need for First Pass Yield,Components of Cost of Quality

CO3.Develop insights about Problem Solving Approach and Basic tools for the same.

CO4. Developnderstanding about Process Improvement methodologies such as Kaizen/Lean/Six sigma

CO5.Develop application for Risk Management and various types of Risks and Risk Mitigation plans.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓	✓	✓	✓		✓	✓

SEMESTER IV – APPLICATION BASED LEARNING

SEM IV: CBBA404: CAPITAL MARKETS

(TCS COURSE)

Course Objectives:

· To provide basic understanding of how capital markets work & the various participants in Capital Markets. · To give a detailed

understanding of Investment Banking from BPS perspective.

· To give a detailed understanding of Mutual Funds, Hedge Funds, Private Equity Funds and calculation of NAVs.

· To provide an understanding of risk management in capital markets.

Course: CBBA404	Course Title: CAPITAL MARKETS (Credits: 04 Lectures/Week: 4L)	60 Hours

CO1.Develop understanding of capital markets work & the various participants in Capital Markets

CO2.Develop understanding of Investment Banking from BPS perspective

CO3. Demonstrate understanding of Mutual Funds, Hedge Funds, Private Equity Funds and calculation of NAVs

CO4.Apply understanding of risk management in Capital Markets

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓			✓	✓	✓	✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓

SEMESTER IV–APPLICATION BASED LEARNING

SEM IV: CBBA405: TAXATION-I

Course Objectives:

· To get the students acquainted with the functioning of the Direct Tax Law in India. · To educate students on how to calculate their income and to help them understand fundamental tax principles as well as to increase their understanding of the various tax deductions and incomes.

Course: CBBA405	**Course Title: TAXATION-I (Credits: 03 Lectures/Week: 4L)**	
UNIT I	**INTRODUCTION TO INCOME TAX ACT, 1961** Definitions and Residential Status a) Basic Terms (Section 2, 3, 4): b) Assesse, Assessment, Assessment Year, Business, Income, Previous Year, Person, Transfer. c) Determination of Residential Status of Individual, Scope of total income (S. 5)	**15 L**
UNIT II	**HEADS OF INCOME- I** a) Salary (S. 15-17) b) Income from house property (S. 22-27) c) Profit and gain from business and profession (S. 28, 30, 31, 32, 35, 35D, 36, 37, 40, 40A and 43B)	**15 L**
UNIT III	**HEADS OF INCOME- II** a) Capital Gain (S. 45, 48, 49, 50 and 54) b) Income from other sources (S. 56-59)	**15 L**
UNIT IV	**DEDUCTIONS UNDER CHAPTER VI A** a) Deductions from total income (S. 80C, 80D, 80DD, 80E, 80U, 80TTA) b) Computation of taxable income and tax amount for Individuals c) Computation of total income and taxable income of Individuals. d) Filing of Income Tax- E-Filing	**15 L**

References:

1. Singhania, Dr. Vinod K. & Dr Monica Singhania, (2021) Students Guide to Income Tax including GST, (24e) Taxmann Publications Pvt. Ltd.

2. Ahuja, Girish & Ravi Gupta, (2014), Systematic approach to Income Tax by Ahuja & Gupta, Bharat Law House Private Ltd.

3. Manoharan, T.N. & G.R. Hari, (2022), Taxation (Including Income Tax-Law and GST), 8e, Snow White Publications Pvt. Ltd.

4. Singhania, Vinod K. (2022), Direct Tax ready reckoner, 46e, Taxmann Publications Pvt. Ltd. 5. Lal, B.B. & N. Vashishta, (2012), Direct Taxes: Income Tax, Wealth Tax & Tax Planning, 30e, I K International Publishing House Pvt. Ltd

Course outcome:

CO1.Understand the process of computation of Income tax and GST through relevant tax laws.

CO2.Ability to compute income under various heads and tax payable under Income tax Act for individuals.

CO3. Gain the perspective of an income tax practitioner.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓		✓	✓		✓	✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

SEMESTER IV APPLICATION BASED LEARNING

SEM IV: CBBA406: BANKING FOR BPS (TCS COURSE)

Course Objectives:

· To give an overview of Banking and an understanding of various asset and liability products. · To give an understanding of Retail banking and its various aspects of account opening, account servicing and payment processing.

· To give a complete overview of Cash management, Funds Transfer, Loan Structure, Underwriting, Trade Finance and handling of International Trade transactions.

Course: CBBA406	Course Title: BANKING FOR BPS (Credits: 04 Lectures/Week: 4L)	60 Hours

COURSE OUTCOME;

CO1. To develop an understanding of various asset and liability products, Financial accounting

across all product types,Customer service facets and tracking,

CO2. To understand and apply different aspects of Risk Management.

CO3. To demonstrate understanding of Retail banking , various aspects of account opening,

account servicing and payment processing

CO4.To apply an understanding of complete overview of Cash management and Funds Transfer.

CO5. To be able to apply aspects of Trade Finance and handling of International Trade transactions

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓	✓	✓	✓		✓	✓
CO6	✓		✓		✓	✓	✓		✓	✓	

SEMESTER IV–APPLICATION BASED LEARNING

SEM IV: CBBA407: STRATEGIC COST MANAGEMENT

Course Objectives:

· Learners should develop skills of analysis, evaluation and synthesis in cost and management accounting. · The subject covers the complex modern industrial organizations within which the various facets of decision–making and controlling operations take place.

Course: CBBA407	**Course Title: STRATEGIC COST MANAGEMENT (Credits :03 Lectures/Week: 4L)**	
UNIT I	**INTRODUCTION TO STRATEGIC COST MANAGEMENT (ONLY THEORY)** a. Strategic Cost Management (SCM): Concept and Philosophy, Objectives of SCM-Environmental influences on cost management practices, Key elements in SCM b. Different aspects of Strategic Cost Management: Value Analysis & Value Engineering, Wastage Control, Disposal Management, Business Process Reengineering, Total Quality Management, Total Productive Maintenance, Energy Audit, Control of Total Distribution Cost & Supply Cost, Cost Reduction & Product Life Cycle Costing (An Overview)	**15 L**
UNIT II	**ACTIVITY BASED COSTING** a. Activity Based Management and Activity Based Budgeting: Concept, rationale, issues, limitations. Design and Implementation of Activity Based Costing (Practical Problems on ABC), Life Cycle Costing, Kaizen Costing, Back flush Costing. b. Evaluation criterion; Return on Cash Systems; Transfer Pricing and Divisional Performance. Transfer Pricing in International Business Related issues of taxation- Direct Tax	**15 L**

UNIT III	**STRATEGIC COST MANAGEMENT PERFORMANCE ASSESSMENT (ONLY THEORY)** a. Cost Audit & Management Audit under companies Act, with reference to strategic assessment of cost & managerial performance Strategic Cost Benefit Analysis of different business restructuring propositions Entrepreneurial approach to cost Management, with reference to core competencies, strategic advantages & long-term perspective of cost Management. b. Six Sigma, Learning Curve, Praise Analysis and Simulation	**15 L**
UNIT IV	**VARIANCE ANALYSIS & RESPONSIBILITY ACCOUNTING (PRACTICAL PROBLEMS)** a) Costing (Material, Labour, Overhead, Sales & Profit) b) Responsibility Accounting –Introduction, Types & Evaluation of Profit Centre and Investment Centre	**15 L**

References:

1. Saxena, V.K. (2020), Strategic Cost Management and Performance Evaluation, 1e, Sultan Chand & Sons.
2. Hariharan, CA K. (2018), Strategic Cost Management and Performance Evaluation, Wolters Kluwer India Pvt. Ltd.
3. Kishore Ravi M. (2018), Strategic Cost Management, 5e, Taxmann's Publications Private Ltd.
4. Blocher, Edward; David Stout; Paul Juras; & Gary Kokins, (2015), Cost Management: A Strategic Emphasis, Student Edition, Mc Graw Hill College.

COURSE OUTCOME:

CO1.Assessing strategic performance of a firm.

CO2.Describe major theories, background work, concepts and research output in the field of strategic management.

CO3.Demonstrate a clear understanding of the concepts, tools & techniques used by executives in developing and executing strategies and will appreciate its integrative and interdisciplinary nature.

CO4. Understand effective application of concepts, tools & techniques to practical situations for diagnosing and solving organisational problems.

CO5. Demonstrate capability of making their own decisions in a dynamic business landscape.

CO6. Develop their capacity to think and execute strategically.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO11

										0	
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓		✓	✓		✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓		✓		✓	✓	✓
CO5	✓	✓		✓	✓	✓	✓	✓		✓	✓
CO6	✓		✓		✓	✓	✓		✓		

***Internship in Service industry Mandatory after Semester IV**

EVALUATION SCHEME
Evaluation scheme for courses
Continuous Assessment (C.A.) - 40 Marks

(i) C.A.-I : Test/ Project/ Assignment (20 Marks)

(ii) C.A.-II : Test/ Project/ Assignment (20 Marks)

MICROBIOLOGY

Program learning outcomes (B.Sc Microbiology)

1. Describe the cellular structure, classify and summarize the different groups of microorganisms and their biological significance.
2. Identify the ubiquitous presence of microbes including viruses, their habitats, methods of studying them and their integral role in causing diseases.
3. Assess and outline the indispensable role of microorganisms in the environment, biogeochemical cycles and bioremediation.
4. Evaluate examples of the vital role of microorganisms in microbial biotechnology, fermentations, and medicinal products important for the wellbeing of man.
5. Create awareness about the role of microorganisms in spoilage of food, principles underlying nutrition and preservation of food.
6. Comprehend the fundamentals of biochemistry, illustrate the cellular pathways and understand its role in the metabolism of both prokaryotes and eukaryotes.
7. Conceptualize basics of prokaryotic genetics, understand classical principles of genetics and regulation of gene expression.
8. Assess the importance of the recombinant DNA technology and learn the principles and processes associated with it.
9. Understand the basic concepts of Immunology, types of immunity, cells and organs of the immune system and mechanisms of humoral and cell mediated immunity.
10. Formulate research hypotheses, compile and analyze biological data using appropriate statistical software.
11. Access the biological databases and apply the bioinformatics tools and techniques in molecular modelling.
12. Recall the principles and methodology underlying chromatography, spectroscopy, electrophoresis and demonstrate the handling of the instruments based on these principles.
13. Describe the different forms of IPR, inculcate bio entrepreneurial skills to convert the microbes and their products into an enterprise and understand the quality management system in the Pharmaceutical industry.
14. Demonstrate competency in laboratory safety, routine and specialized microbiological skills and techniques: aseptic transfers, pure culture techniques, preparation of samples and staining methods, enumerate microorganisms in a sample, use of common lab equipment which are used in industry and clinical settings.
15. Analyze clinical samples, perform suitable diagnostic procedures and interpret the findings.

COURSE LEARNING OUTCOMES (CLOs)

SEMESTER I

Course Code: SMIC101

Course Title: Fundamentals of Microbiology

1. Describe the historical development and scope of microbiology.
2. Explain the structure and function of prokaryotic cells.
3. Compare Bacterial, Archaebacterial and Eukaryotic cells.
4. Outline the basic safety measures to be adopted in a microbiology laboratory.
5. Discuss types of bonds and their importance.
6. Explain the structure and properties of water.
7. Define biomolecules and classify them.
8. State the biological importance of carbohydrates, lipids and proteins.
9. Describe the 3D structure of proteins.
10. Outline the structure and function of different types of nucleic acids.
11. Differentiate between DNA and RNA.
12. Illustrate the structural organization of chromosomes in eukaryotes.

Course Code: SMIC102

Course Title: Basic Techniques in Microbiology

1. Explain the construction, principle, working and applications of Compound, Dark Field and Phase Contrast Microscope.
2. Classify different types of stains and staining methods.
3. Discuss the principle of Gram's staining and give significance of each step of the staining method.
4. Choose an appropriate staining method to demonstrate special structures of bacteria.
5. Define sterilization, disinfection, asepsis, sanitization, germicide and justify the conditions influencing the effectiveness of antimicrobial agents.
6. State the principle underlying sterilization instruments.
7. Enlist the different methods of sterilization and their applications.
8. Evaluate the effectiveness of an antimicrobial agent.
9. Classify microorganisms on the basis of nutritional requirements.
10. Describe various culturing and preservation methods of microorganisms.

Course Code: SMIC1PR

1. Perform special staining to demonstrate the different structures of bacteria like cell wall, capsule, spore and metachromatic granules.
2. Qualitatively detect the presence of carbohydrates, proteins, amino acids, nucleic acids using appropriate tests.
3. Measure the cell dimensions using micrometry.
4. With the help of Gram's staining, demonstrate the morphology of various microorganisms.
5. Demonstrate the effect of UV light on different types of bacteria.
6. Show the effect of heavy metals, dyes and phenolic compounds on bacteria.
7. Aseptically transfer culture media and prepare slants and plates.
8. Isolate microorganisms on Nutrient agar and MacConkey's agar and study its colony characteristics.

SEMESTER II

Course Code: SMIC201

Course Title: Microbial Diversity

1. Explain general properties, structure and cultivation of Viruses.
2. Illustrate the lytic cycle and lysogeny in bacteriophages.
3. Discuss the general features and biological significance of *Rickettsia, Coxiella, Chlamydia, Mycoplasma,* archaebacteria and cyanobacteria.
4. Give an account of types of cell wall found in actinomycetes and state their importance.
5. Compare the different categories/groups/divisions of protozoa, algae and fungi.
6. Differentiate between algae and cyanobacteria.
7. Describe the biological and economic importance of algae and fungi.
8. Compare and contrast between cellular and acellular slime molds.
9. Define growth and explain the various phases of the growth curve.
10. Classify and explain the methods for measurement of microbial growth.
11. Discuss the influence of environmental parameters such as pH, oxygen, temperature, pressure, salt concentration and radiation on growth of microorganisms.
12. Describe biofilm formation and Quorum sensing techniques.

Course Code: SMIC202

Course Title: Exploring Microbiology

1. Discuss the construction, working, principle and applications of electron, confocal and fluorescent microscope.
2. State Beer Lambert's law and differentiate between colorimeter and spectrophotometer.

3. Explain the principle of pH meter, solve problems using Henderson Hassalbach equation and solution preparation of various weight by volume units.
4. Enlist different types of microbial interactions with examples.
5. Define phyllosphere, rhizosphere, rhizoplane and mycorrhizae.
6. Elaborate on microbial associations with plant vasculature using Rhizobium, Actinorhhizae and Agrobacterium as examples.
7. Illustrate the significance of normal flora of humans and give examples of microorganisms residing in different anatomical sites.
8. Give significance and characteristics of Gnotobiotic animals.
9. Explain the types of infections, process of infection and the carrier states.
10. Discuss the basic principles of Epidemiology.

Course Code: SMIC2PR

1. Study the characteristics of fungi and actinomycetes using isolation and slide culture techniques.
2. Plot the growth curve of *E.coli* and calculate its generation time.
3. Calculate the viable count of microorganisms using spread plate and pour plate methods.
4. Enumerate yeast cells using Haemocytometer and Breed's count methods.
5. Design an experiment to show the effect of pH, temperature and osmotic pressure on the growth of microorganisms.
6. Demonstrate the activity of virulence factors like coagulase, haemolysin and lecithinase present in pathogens.
7. Calculate the pH of a buffer solution and prepare laboratory solutions of different concentrations.
8. Determine the lambda max and verify Beer Lambert's law using a colorimeter.

Semester III

Course Code: SMIC301
Course Title: Essentials of Molecular Biology

1. Explain the principles of inheritance of genetic traits and solve problems based on Mendelian genetics.
2. Outline the structural organisation of prokaryotic chromosomes and packaging of DNA molecules into eukaryotic chromosomes.
3. Assess if the genetic trait is dominant or recessive by solving pedigree questions.
4. State the Hardy Weinberg law and explain the factors governing population genetics.

5. Understand the principles of methods underlying the extraction, purification and detection of DNA from varied sources.
6. Identify and apply the hybridization techniques to detect and localize the presence or absence of specific DNA sequences and to identify pathogens.
7. Compare and contrast the methods used for sequencing of DNA.
8. Illustrate the applications, components and steps of PCR and identify the various factors that affect the yield of PCR products.
9. Describe the historical evidences for semiconservative, bidirectional and semi-discontinuous process and theta mode of DNA replication
10. Summarize the events of DNA replication and the properties and role of the proteins and enzymes in both prokaryotes and eukaryotes.
11. Compare and contrast the mode of DNA replication in prokaryotes and eukaryotes
12. Explain the rolling circle mode of replication in plasmids and bacteriophages

Course Code: SMIC302

Course Title: Research Methodology, Biostatistics and Analytical Techniques

1. State the principle and procedure of different methods used in elemental analysis.
2. Choose an appropriate method to estimate different macromolecules.
3. Illustrate an experiment on extraction of lipids from cell suspension using Soxhlet apparatus.
4. Discuss the principles of planar, column chromatography, types and give the salient features of HPLC and GC systems.
5. Describe the different rotor systems used in centrifugation and give their application.
6. Distinguish between Preparative and Analytical methods and give their significance.
7. Explain the separation of cell components using the right centrifugation procedure based on principles of sedimentation.
8. Explain the general principles, construction and working of Gel Electrophoresis and Discuss the various types of Gel Electrophoresis methods.
9. Define the different forms of Intellectual Property Rights and explain the procedure of obtaining a Patent and discuss the different categories of Patents.
10. Distinguish between research and a review article and employ online sites like Pubmed, Google Scholars and lens.org to find relevant information on a research topic.
11. Write an abstract for a given manuscript.
12. Understand the different source types of data, describe the various sampling techniques and articulate it using appropriate statistical tools.

13. Explain the measures of Central tendencies and their application and distinguish between Parametric and Non- parametric statistical tests.
14. Formulate Hypothesis based on a research problem.

Course Code: SMIC303

Course Title: Environmental and Applied Microbiology

1. Explain the importance of airborne pathogens and types of bioaerosols.
2. Sketch the aeromicrobiological pathway of airborne particles.
3. Identify the various factors that affect the microbial survival in air.
4. Characterize the different types of air samplers on the basis of their biological efficiency.
5. Discuss different methods of air sanitation.
6. Enlist biotic and abiotic factors affecting soil microorganisms.
7. Articulate the soil environment and explain the role of microorganisms in it.
8. Compare and contrast between the sampling strategies and methods used for surface and subsurface soil.
9. Give significance of various biogeochemical cycles in nature and enlist the role of microorganisms in these processes.
10. Explain with reason the different types of microbes present in the fresh aquatic environment.
11. Describe the methods used for treatment of potable water and wastewater.
12. Define indicator organisms and explain different methods used to demonstrate their presence in potable water.
13. Discuss the various methods of disposal of treated wastewater and biosolids.
14. Enlist the types, advantages and disadvantages of biofertilizers.
15. How will you produce biofertilizers on a large scale?
16. Explain the role of *B. thuringiensis* and Baculovirus as biopesticides.
17. Examine the role of microorganisms in bioremediation technologies.
18. Define and give examples of bioleaching and bioplastics.

Course Code: SMIC3PR

1. Extract genomic DNA from *E.coli* and demonstrate its presence using DNA Gel Electrophoresis and Spectrophotometric techniques.
2. Explain the working principle of thermal cyclers.
3. Design experiments to estimate different macromolecules.
4. Exemplify sizing of yeast using density gradient centrifugation.
5. Enumerate microorganisms in air and compare it’s load after fumigation.
6. Detect the presence of coliform and comment on potability of water.
7. Evaluate the quality of sewage water using parameters like total solids, COD, BOD and microbial load.

8. Isolate and study the activity of microorganisms in soil.
9. Carry out literature studies and design a research proposal.

SEMESTER IV

Course Code: SMIC401

Course Title: Microbial Biochemistry

1. Define metabolism, differentiate between catabolism and anabolism and discuss analysis of the metabolic pathways using different experimental approaches.
2. State the Laws of Thermodynamics, relate it to the concept of entropy, free energy and enthalpy and solve problems based on entropy, free energy and enthalpy.
3. Enlist the high energy compounds, explain their hydrolysis and discuss the factors that make ATP as a central energy molecule.
4. Comment on the biological oxidation reduction reaction mechanism mediated by nicotinic acid and flavoproteins as coenzymes.
5. Define enzymes, cofactors, coenzymes, active site, catalytic site, substrate binding site and allosteric enzymes.
6. Derive and solve problems based on Michaelis Menten's equation and Line-Weaver Burke's plot.
7. Tabulate the different classes of enzymes and state their properties.
8. Discriminate between the enzyme inhibitors based on their interaction with the enzyme and its effect on enzyme kinetics.
9. Sketch the mechanisms of multi-substrate enzyme reactions citing an example.
10. Compare and contrast the transcription and translation processes in prokaryotic and eukaryotic cells.
11. Define codon and explain the relationship between codons on mRNA and the amino acids in a polypeptide.
12. Give an account of the molecular details of the transcription and translation process and enlist the enzymes, protein factors, and energy sources for each stage in prokaryotes and eukaryotes.
13. Indicate the ways in which RNA is modified after transcription in eukaryotic cells-capping, tailing and splicing.

Course Code: SMIC402

Course Title: Basics in Immunology and Taxonomy

1. Define different types of immunity and explain the physical and chemical mediators of innate immunity.
2. Elaborate on the mechanisms of innate immunity like phagocytosis and inflammation.

3. Discuss the cells and organs of the immune system with respect to their structure and function.
4. Illustrate the various pathways of Complement activation and give an account of the biological consequences of complement activation and their role in linking innate and adaptive immunity.
5. Discuss the different clinical specimens and state the methods of sample collection.
6. Explain the various molecular diagnostic methods.
7. Give significance of rapid identification methods, antigen detection and blot immunoassay.
8. Explain the three-domain concept based on phylogeny.
9. Describe the methods of analysis used in classification (Phenotypic- FAME analysis, genotypic- hybridization, G+C ratio, Genetic fingerprinting and phylogenetic- Sequencing techniques).
10. Solve problems based on simple matching coefficients, jaccard coefficients and construction of phylogenetic trees.

Course Code: SMIC403

Course Title: Food and Industrial Microbiology

1. Describe the intrinsic, extrinsic and implicit factors affecting growth and survival of microbes in food.
2. Discuss the causes of food spoilage, classify food by ease of spoilage and describe the chemical changes caused by microorganisms in food.
3. Define food-borne diseases, explain the significance of food borne diseases and write about the emerging pathogens related to food.
4. Explain the measures adopted to ensure the quality of food and enlist the various organisations involved in making provisions to ensure the quality of food.
5. Discuss the HACCP concepts and create a HACCP plan for a food processing unit.
6. Enlist the various methods of preservation of food and state the principles underlying them.
7. Discuss the sources of contamination in milk, microbes associated with milk (indigenous microflora and contaminant microorganisms) and methods used in improving the quality of raw milk.
8. Explain the different tests employed to evaluate the quality of milk. eg. Platform tests, Direct Microscopic Count, Plating technique Nucleic acid-based assays, Immunological assays and use of Biosensors
9. Define starter cultures and schematically represent the manufacturing process of Cheese, Butter and Yoghurt.
10. Enlist the range of fermentation processes and products and illustrate the outline of a fermentation process
11. Describe the criteria for an ideal fermentation medium and discuss the types of raw materials used.

12. How will you carry out primary and secondary screening of amino acids and antibiotics?
13. Compare and contrast between types of fermentations: Anaerobic, Surface, Submerged, Solid, Batch, Fed- batch, Continuous and Dual fermentations.
14. Sketch the basic design of a fermenter and describe the functions of its components.

Course Code: SMIC4PR

1. Demonstrate the effects of pH, temperature and substrate concentration on enzyme activity and determine its Km and Vmax.
2. Differentiate the types of blood cells using a staining technique.
3. Group the strain of *Pseudomonas* using Pyocin typing method.
4. Study the different media and biochemical tests used in the identification of bacteria.
5. Isolate and study the cultural characteristics of a food spoilage organism.
6. Determine the Thermal Death Time, Thermal Death Point and Minimum Inhibitory Concentration of salt for the isolated food spoilage microbe.
7. Check the quality of milk by dye reduction tests, direct microscopic count, and plating techniques.
8. Evaluate the efficiency of pasteurization of milk using phosphatase test.
9. Screen the antibiotic producers from soil by crowded plate and Wilkin's agar overlay method.
10. Demonstrate the spectrum of antibiotic by agar strip and streak plate methods (secondary screening).
11. Using appropriate tools and techniques, test the research hypothesis formulated in Semester III and report your findings.

Semester V

Course Code - SMIC501

Course Title - Molecular Genetics and Cell Biology

1. Define mutations, enlist the types and state the processes by which mutations occur.
2. Analyze and interpret sequence data to determine the effect of mutation.
3. Demonstrate the growth of mutants using suitable screening techniques.
4. Compare and contrast the mechanisms of DNA repair and recombination.
5. Enlist and illustrate the mechanisms of horizontal gene transfer in bacteria.
6. Describe the models of homologous and site specific recombinations.
7. Construct the genetic map based on the recombination frequency.
8. Solve problems based on transformation, conjugation and transduction.

9. Identify major eukaryotic cell structures and explain their associated functions.
10. Summarise the components and properties of cell wall of yeasts, plants and fungi
11. Enlist and differentiate between the cytoskeletal elements.
12. Illustrate the role of endoplasmic reticulum and golgi bodies in protein sorting and targeting.
13. Outline and describe the sequences of events involved in the signal transduction pathways in a cell.
14. State the nature and role of extracellular messengers, their associated receptors, second messengers in signaling pathways.
15. Compare and contrast G-protein-linked receptor and tyrosine-kinase receptors
16. Describe the mechanisms by which cells regulate and terminate responses to chemical signals.

Course Code: SMIC502

Course Title: Medical Microbiology and Immunology- I

1. Comprehensively explain various virulence factors of bacteria, which helps them in establishing infections.
2. Comment on the morphology, cultural characters, pathogenicity, diagnosis, treatment and prevention of organisms causing gastrointestinal tract infections eg. *E.coli, Vibrio, E.histolytica, Salmonella, Shigella.*
3. Give an account of morphology, cultural characters, pathogenicity, diagnosis, treatment and prevention of organisms causing skin infections eg. *Staphylococcus, Streptococcus pyogenes, Leprosy, Candida albicans.*
4. Discuss the morphology, cultural characters, pathogenicity, diagnosis, treatment and prevention of organisms causing respiratory tract infections eg. *M.tuberculosis, K.pneumoniae, S.pyogenes.*
5. Compare between emerging viral infections caused by MERS CoV and SARS CoV-2.
6. Define antigens, haptens, immunogens and explain various factors that affect immunogenicity.
7. Differentiate between B cell and T cell epitopes.
8. Illustrate the structure of an Immunoglobulin molecule and enlist characteristics of different types of Immunoglobulins.
9. Summarize the effector functions of antibodies and elaborate on the production and applications of monoclonal antibodies.
10. Discuss the basic structure and functions of MHC class I and II molecules.
11. Explain the cytosolic and endocytic pathways for antigen presentation.
12. Summarize the different types of antigen antibody reactions and give their applications.

13. Explain principles of ELISA, Radioimmunoassay, Flow cytometer, Western blot and interpret their results.

Course Code: SMIC503

Course Title: Microbial Biochemistry: Part-I

1. Describe the composition and architecture of bacterial cell membrane and explain its role in solute transport.
2. Summarize the methods used to study solute transport.
3. Compare and contrast mechanisms of substrate uptake in bacteria based on energy involvement and concentration gradient.
4. Sketch the role of binding proteins in uptake of maltose and histidine.
5. Schematically explain composition and function of mitochondrial and prokaryotic electron transport chains.
6. Define Substrate level phosphorylation, oxidative phosphorylation and photophosphorylation.
7. Describe chemiosmotic theory, structure of ATP synthase and its role in ATP generation.
8. State the significance of Bacteriorhodopsin as a proton pump in *Halobacteria* and illustrate the biochemistry of bioluminescence in bacteria.
9. Enlist and explain the techniques used in experimental analysis of metabolism.
10. Schematically explain and differentiate the catabolic pathways of carbohydrates in diverse group of organisms
11. Construct balance sheets of ATP generation in Glycolysis, TCA and ED pathways.
12. Discuss the breakdown and uptake of sugars such as polysaccharides, oligosaccharides and monosaccharides.
13. Compare and contrast glycolysis and gluconeogenesis.
14. Outline the various types of fermentation pathways with enzymes and specific examples (Homofermentation, Heterofermentative, Bifidum, Alcohol, Mixed Acid, Butanediol, Butyric Acid, Acetone-Butanol, Propionic acid).
15. Explain biosynthesis of glycogen and peptidoglycan.

Course Code: SMIC504

Course Title: Bioprocess Technology: Part – I

1. Explain the principle of strain improvement of cultures used in industries and describe selection of induced mutants for production of primary and secondary metabolites.

2. Understand the various regulatory mechanisms in synthesis of metabolites, discuss steps involved in manipulation of pathways to generate different types of mutant and explain how they can be used in production of primary & secondary metabolites.
3. Apply the principles of Parasexual cycle, Protoplast fusion and recombinant technology for strain improvement.
4. Define inoculum, list the key criteria for inoculum development and discuss the inoculum development methods used for yeast, bacterial and fungal processes
5. Explain the working principle of Air lift fermenters, bubble-cap, photobioreactors, deep jet fermenters and state their application.
6. State the consequences of contamination and the method to avoid them and solve problems based on the kinetics of Sterilization.
7. Discuss the factors contributing to loss of medium quality and how these factors also influence the method of sterilization
8. Compare and contrast between Batch and Continuous sterilization.
9. Discuss the indirect and direct types of continuous sterilizer and give their advantages and disadvantages.
10. Explain the principles of filter sterilization and distinguish between Depth and Absolute filters.
11. Discuss the working principle for sterilization of Air, feeds and exhaust gas.
12. State the properties of chemicals used as sterilant.
13. Explain medium sterilization by chemical agents and radiation.
14. Discuss the principles of Scale up and scale down and give its significance
15. State the different methods and techniques used in the down streaming process to obtain a pure compound.
16. Illustrate and discuss the factors influencing the traditional fermentation processes e.g; Beer, Wine, Ethanol, Vinegar and Biogas.

Course Code: SMIC5PR1

1. Demonstrate the effect of UV light on *E.coli* and study the repair mechanisms.
2. Determine the dosage of UV required for mutagenesis.
3. Isolate and identify the mutants using appropriate techniques.
4. Exploit the morphological, cultural and biochemical properties and cultivate the standard cultures *E. coli, Klebsiella spp., Proteus spp., Pseudomonas spp.,Salmonalla typhi, S. paratyphi A, S. paratyphi B, Shigella spp., S .pyogenes, S. aureus*.
5. Identify the etiological agents of diseases based on the case studies from appropriate clinical specimens.
6. Using serological reactions diagnose a case of typhoid/paratyphoid infection.

7. Demonstrate the use of Single Radial Immunodiffusion in determining the concentration of soluble antigen.
8. Determine the relationship between soluble antigens with the help of Ouchterlony immunodiffusion method.

Course Code: SMIC5PR2

1. Demonstrate bioluminescence in plate media.
2. Estimate glucose level in biological samples using enzymatic method.
3. Study the fermentative and oxidative metabolism of glucose.
4. Cultivate and differentiate between the homofermenters and heterofermenters.
5. Carry out fermentation of alcohol in the laboratory and calculate the efficiency of the process.
6. Set up solid substrate and shake flask fermentation to produce amylase and comment on the yield obtained.

Course Code: SMIC5AC

Course Title: Food Production and Processing (General Principles)

1. Discuss the different components of food, their functions in metabolism, sources and disorders due to their deficiencies.
2. Summarise the different types of food additives, their role and permissible limits.
3. Explain the different methods of calculating the energy value of food.
4. Define Basal Metabolic Rate, describe the methods of evaluating it and the factors affecting it.
5. State the different food groups and write how would you plan a balanced diet using this information.
6. Illustrate the procedure for the production of fruit and vegetable-based products such as jams, jellies, sauce, pickles etc.
7. Compare and contrast between the processing of dairy products eg. condensed milk, dry milk and flavoured milk.
8. Write the steps involved in the production of mushroom, Baker's yeast, oysters etc.
9. Describe the processing of cereals grains, pulses, oilseeds, spices, meat and fish and explain the underlying principle.
10. Comment on the effect of new methods on the nutritive value of foods -Microwave, high pulse pressure, Ohmic heating, radiation sterilization.
11. Discuss the principles behind physical,chemical methods of food preservation and the emerging preservation technologies.
12. Define convenience food and give its significance.

Course Code: SMIC5ACPR

1. Estimate the amount of sugar, proteins, vitamins in different food samples.
2. Prepare an individual diet chart based on calorie intake.
3. Prepare Tomato ketchup and jam, preserve them using hurdle technology and check the efficiency of preservation.
4. Grade the quality of milk using the rapid platform test.
5. Carry out a survey-based project and interpret the results based on data collected.

Semester VI

Course Code: SMIC601

Course Title: rDNA TECHNOLOGY, BIOINFORMATICS & VIROLOGY

1. Enlist the model organisms used in molecular biology and study their characteristics.
2. Give an account of the non-chromosomal and transposable elements such as plasmids, insertion sequences and transposons.
3. Summarize the basic steps involved in gene cloning and discuss the role of restriction endonucleases, ligases, alkaline phosphatases, adaptors and linkers in gene cloning.
4. Compare and contrast between the vectors used for cloning of genes.
5. Construct genomic and cDNA libraries and screening of recombinants using the library.
6. Differentiate between PCR, Reverse Transcriptase-PCR and Real time PCR.
7. Summarize the applications of Recombinant DNA technology in DNA typing, molecular testing, gene therapy, crop improvement and procedure for generating genetically engineered plants and animals.
8. Extract data from key bioinformatic databases such as Pubmed, NCBI, Genbank, Swiss-Prot and use selected tools at NCBI and EBI (BLAST, FASTA) to run simple analysis on genomic and protein sequences.
9. Compare and contrast the molecular mechanism controlling expression of repressible and inducible operons (Lac and trp).
10. Apply the basic concepts of positive and negative regulation of bacterial genes to explain the results involving regulatory mutants.
11. Explain classification, architecture, cultivation, visualization and enumeration techniques of viruses.
12. Describe at the molecular level the replication strategies of DNA and RNA viruses.
13. Illustrate the structure and sketch the life cycle of TMV, T4, Influenza virus, SARS-COV-2, HIV.
14. Categorize oncogenic viruses and state their role in cancer.

15. Define prions, viroids and explain their basic properties.
16. Differentiate the lytic and lysogenic pathway in lambda phage and summarize the regulatory mechanisms.

Course Code - SMIC602

Course Title - Medical Microbiology and Immunology- II

1. Enlist pathogens that can cause vector borne infections, sexually transmitted diseases and central nervous system diseases.
2. Comment on the life cycle, diagnosis and treatment of *Plasmodium vivax* causing Malaria.
3. Discuss the characteristics of the etiological agent, pathogenicity, lab diagnosis and prevention of Leptospirosis.
4. Give an account of the morphology, cultural characters, pathogenicity, diagnosis, treatment and prevention of organisms causing AIDS, Syphilis, Tetanus, Polio, Rabies, Meningitis.
5. Define selective toxicity, minimum inhibitory concentration, minimum bactericidal concentration for a chemotherapeutic agent.
6. Classify different antibiotics on the basis of their site of action on the bacterial cell wall, cell membrane, protein synthesis, nucleic acid synthesis and metabolic pathways.
7. Discuss mechanisms of drug resistance and explain methods of antibacterial susceptibility testing.
8. Illustrate the structure of T cell receptor and co receptors.
9. Explain the activation and differentiation of T cells and B cells.
10. Comment on the mechanisms of Humoral and Cell mediated Immune responses.
11. Justify the role of vaccines in building immunity and explain the principle of classical and modern vaccine strategies.
12. Comment on the route of administration of vaccines and vaccination schedule as per Indian pharmacopoeia.
13. Classify hypersensitivity reactions and explain the mechanisms of Type 1 to type 4 reactions.
14. Give an account of the human blood group systems and explain haemolytic disease of the newborn.
15. Define autoimmunity, immune tolerance and immune suppression.
16. State the different types of autoimmune diseases, their mechanisms and treatment.

Course Code: SMIC603

Course Title: Microbial Biochemistry: Part-II

1. Outline the steps and enzymes involved in catabolism of fatty acids via βoxidation pathway, acrylyl-CoA pathway and methyl citrate pathway.
2. Calculate the energy yield when palmitate is catabolized by the β-oxidation pathway.
3. Discuss biosynthesis of palmitic acid, phosphoglycerides and polyhydroxybutyrate in bacteria.
4. Explain the omega oxidation of aliphatic hydrocarbons in *Pseudomonas, Corynebacterium* and yeast and the ortho and meta cleavage of aromatic compounds.
5. Enlist the different types of enzymes that degrade proteins and write the general reactions of amino acids catalyzed by amino acid decarboxylases, amino acid deaminases, amino acid transaminases and amino acid racemases.
6. Schematically explain oxidation of a pair of amino acids by Stickland reaction and single amino acid oxidation- glutamate fermentation by *C. tetanomorphum*.
7. Give a general scheme of amino acid families and explain biosynthesis of the serine family.
8. Outline the steps in the catabolism and anabolism of purine and pyrimidine nucleotides
9. Summarize the general modes of metabolic regulation and discuss covalent modification and non-covalent enzyme inhibition for regulation of enzyme activity.
10. Discuss the features of DNA binding regulatory protein and explain their role in the positive and negative control of transcription using a suitable example.
11. Give an account of catabolite repression and stringent response as global regulatory mechanisms.
12. Schematically explain regulation of Tricarboxylic acid cycle and EMP.
13. Schematically explain photosynthetic machinery and mechanisms in different group of organisms
14. Explain the assimilatory and dissimilatory pathways for nitrate and sulphate
15. Illustrate Denitrification, biological ammonia and nitrogen fixation.
16. Enlist organisms and products formed during oxidation of Hydrogen, carbon monoxide, ammonia, nitrite, sulphur, Iron (lithotrophy).

Course Code: SMIC604

Course Title: Bioprocess Technology: Part – II

1. State the different cell lines and describe the different equipment's and techniques used in characterization of cell lines
2. Define totipotent, pluripotent, multipotent, unipotent and explain the various methods used in culturing of stem cells
3. Discuss the various application of animal tissue culture and stem cells
4. Explain the steps involved in in vitro culturing of plant cells and summarise the techniques used in plant tissue culture and give its applications.

5. List the different types of vaccines and write the protocol for production of bacterial and viral vaccines.
6. Discuss the various quality tests and safety controls employed during vaccine generation eg. In process control & Final product control.
7. Explain the terms quality, quality control, quality assurance and quality management also distinguish between quality control and quality assurance.
8. Discuss the significance of five variables i.e. labels, packaging materials, raw materials, in process items and finished products in batch processes and also enlist the documents needed in quality control systems.
9. Explain the important criteria through which quality is assured e.g. Bioburden determination, Environmental monitoring, in process monitoring of sterilization procedures, Sterility testing.
10. Describe the working of physical, chemical and biological indicators used to monitor sterilization.
11. Compare and contrast between the different methods of sterility testing.
12. Discuss the purpose of bioassays and enlist the requirements of a test culture.
13. Explain the principle underlying various types of bioassays and give bio-parameters affecting the antibiotic bioassay.
14. State the principle, working and application of Infrared Spectrophotometry, Atomic absorption and atomic emission flame photometry, Spectrofluorimetry and radioisotopic methods.
15. Define Bio-entrepreneurship, explain the relation between Biotechnology, Bio-Entrepreneurship and Bio-Economy and write the points for a successful Bio-enterprise.
16. techniques used in immobilization and discuss the applications of immobilized enzyme/cells in food, detergent and therapeutic industries.
17. Illustrate and discuss the factors influencing the fermentation processes e.g; Penicillin, Streptomycin, Vitamin B12, Citric acid, Glutamic acid and discuss the steps in Steroid Transformation.

Course Code: SMIC6PR1

1. Perform enrichment and isolation of coliphages from sewage and enumerate them.
2. Interpret and formulate restriction map of DNA after restriction digestion.
3. Visualize the bands of plasmids in gel after extraction using alkaline lysis method.
4. Predict and quantitate the expression of beta galactosidase in *E.coli* when grown in a media containing different sugars.
5. Visit & explore various websites (NCBI and EMBL) and biological databases (GenBank, DDBJ, SwissProt, PDB).
6. Use BLAST and FASTA for structural and sequence analysis.
7. Locate Open Reading Frames, Restriction sites in gene and Construct the phylogenetic tree using online tools and softwares.
8. Demonstrate and identify the malarial parasite in blood film.
9. Choose appropriate antibiotics, perform susceptibility testing using Kirby Bauer method.

10. Perform immunohematology tests for diagnosis of various conditions (blood grouping, compatibility testing, detection of incomplete antibodies, Isoagglutinin titre) and interpret the results.

Course Code: SMIC6PR2

1. Isolate and detect PHB producing bacteria from natural sources.
2. Design a medium to study catabolite repression and diauxic growth.
3. Estimate the uric acid content in biological samples using Henry Caraway's method.
4. Evaluate the potential of isolates enriched and obtained from natural sources to degrade phenol.
5. Perform bioassay of antibiotics and growth factors to evaluate the potency and efficacy of the molecules.
6. Prepare immobilized beads using yeast cells and determine the invertase activity of the same.
7. Perform sterility tests to ensure that pharmaceutical products are sterile and safe for use.
8. Demonstrate the growth of callus using tissue culture techniques.
9. Estimate the concentrations of protein by the Folin lowry method.
10. Perform chemical estimation of penicillin by titrimetric method.

Course Code: SMIC6AC

Course Title: Food Production and Processing (Applications and Quality Assurance)

1. Describe the use of Genetic Engineering in modification of plant nutritional content, plant taste and appearance, increase in plant yield, delaying fruit ripening and production of edible vaccines.
2. Discuss the use of nanotechnology in food production.
3. Schematically explain the production of sauerkraut, cucumber pickles and Fermented Soybean Products such as miso, tofu, soy sauce.
4. Explain fermentation technology employed in bakery (bread), animal product (sausages) and plant product (idli).
5. Give an account of nutraceuticals and functional foods.
6. Compare Probiotics, Prebiotics and Synbiotics and state their significance.
7. Summarise the principles of food spoilage.
8. Discuss the various food hazards (microbial and non- microbial eg adulteration) and their effects.

9. State the methods of food analysis: sensor, chemical and biological and enlist the different laws, national and international institutions governing food quality.
10. State the functions of food packaging and describe the use of different materials in packaging.
11. Explain the various methods of food packaging like micro-ovenable, modified atmosphere, aseptic processing packaging etc.
12. Write the points to be considered when designing a packaging system and state the laws related to packaging.
13. Summarize food labelling in terms of guidelines stated and recent developments.
14. Discuss the different tests employed to evaluate the quality of packaging material.

Course Code: SMIC6ACPR

1. Prepare sauerkraut and demonstrate the importance of fermentation technology in food preservation.
2. Study the Microbial fermentation of Idli batter for upto 8 hrs and comment on the role of microflora.
3. Extract and detect the nutraceuticals such as lycopene from natural sources.
4. Detect the presence of common adulterants in food samples.
5. Analyze the moisture and salt content in butter and cheese samples using FSSAI guidelines.
6. Carry out synthesis of silver nanoparticles and study its antimicrobial activity.

LIFE SCIENCES

Programme Outcomes:

A student graduating with the Degree B.Sc Life Science should be able to

1. Acquire core competency in Molecular and Cell Biology.
2. Apply principles of various Separation and Screening techniques.
3. Equipped with the knowledge of Microorganisms/Viruses and their growth.
4. Elucidate the Pathogenesis of infectious diseases, and related clinical trials/toxicology management.
5. Develops the concepts of the biochemical basis of prokaryotic and eukaryotic life and the underlying uniformity that forms the basis of all organisms at the cellular level.
6. Describe the organs and molecules involved in Physiology, Life process, and Homeostasis in prokaryotic and eukaryotic organisms.
7. Comprehend the basic principles of Genetics and its application in genetic engineering/biotechnology.
8. To understand the functioning of ecosystems; the correlation between ecology and behaviour.
9. Interpret the process of Evolution and development of organisms (plant and animal) from unicellular to multicellular.
10. Meticulously analyse the Metabolism of organisms (prokaryotes and eukaryotes) that helps understand their isolation and potential to produce desired metabolites.

11. Conceptualize various Defensive mechanisms involved in fighting against the pathogens in invertebrates, vertebrates, and Plants.
12. Application of various scientific methods in research to address different questions by formulating the hypothesis, data collection and critically analysing the data to decipher the degree to which their scientific work supports their hypothesis.Understand the significance of research as a tool to achieve knowledge.
13. Realise the importance of Biodiversity and related Environmental issues and Sustainable Development.
14. Explain underlying developmental biology processes during tissue development and organogenesis including the brain and nervous system.
15. Become an entrepreneur by using microorganisms to mass-produce biofertilizers, fermented products, and pharmaceutically important biomolecules. Also utilizing the practical hands-on training to become employed in diagnostic, industrial, pharmaceutical, food, and research and development laboratories.

Course Learning Outcomes:

Course Code	Course Title	Course Learning Outcomes
SLSC101	Life Sciences at the molecular and cellular levels	Upon successful completion of this course, the student will be able to: (a) Differentiate between prokaryotes and eukaryotes. (b) Understand the fundamental chemical processes and interactions that prevail in living systems (c) Know how the simple precursors give rise to large biomolecules such as proteins, carbohydrates, lipids, nucleic acids. (d) Apply the tools that may be used in the study of biomolecules and cells. (e) Explain the microbial growth and its separation techniques.

SLSC102	Introduction to plant and animal life processes	Upon successful completion of this course, the student will be able to: (a) Understand types of nutrition in plants and animals; nutritional adaptations; anatomy and physiology of digestion; evolutionary adaptations (b) Explain functions of organ systems and cellular functions (Life processes including transport and circulation in plants and animals; support and locomotion, respiration and gaseous exchange, excretion, and osmoregulation) (c) Integrate physiology from the cellular and molecular level to the organ system and organismic level of organization. (d) Understand the role of body systems and mechanisms in maintaining homeostasis (e) Analyze the implications of life processes on overall health and diseased state
SLSC201	Life Sciences at the molecular and cellular levels	Upon successful completion of this course, the student will be able to: (a) Demonstrate knowledge of basic concepts of cell biology and of those properties that are common to most eukaryotic cells. (b) Describe the function and the composition of the plasma membrane. (c) Explain the importance of cytoskeletal elements. (d) Understand the basis and significance of mitosis and meiosis (e) Develop evidence-based critical thinking in cell biology with in depth knowledge of the role of different cell organelles in the critical developmental processes.

SLSC202	Elementary genetics, ecology and behavior	Upon successful completion of this course, the student will be able to: (a) Understand Gene concept, Mendelian inheritance along with problem-solving –mono and dihyrbrid crosses, Sex-linked inheritance, pedigree analyses (b) Correlate Non-Mendelian inheritance, intra-allelic and inter-allelic gene interactions (c) Differentiate types of mutations and human congenital disorders (d) Apply the Principles of genetic engineering (e) Understand the Principles of ecology, ecological succession, ecosystems, Biogeocycles, Interspecific interactions and behavioural ecology
SLSC301	Comparative Physiology	Upon successful completion of this course, the student will be able to: (a) Understand Cell signaling pathways and communication between cells. (b) Learn the concepts of Neuroendocrinology, glands, and hormones involved. (c) Explain the Nervous System, Propagation of Nerve impulses and synapses. (d) Comprehend Behaviour and behavioural adaptations in Plants and Animals. (e) Understand the sex determination mechanism in animals
SLSC302	Life processes at the tissue, organ and organism levels: A Biochemical Approach	Upon successful completion of this course, the student will be able to: (a) Describe the role of enzymes as biocatalysts, with introductory knowledge on enzyme kinetics. (b) Understand basic cellular energy metabolism utilizing glucose and fatty acids, elementary amino acid metabolism viz. transamination, deamination & urea cycle (c) Learn the Composition & role of oxidative phosphorylation and photophosphorylation systems in cellular ATP synthesis.

		(d) Provide students with deep knowledge and understanding of biomolecules,key biochemical concepts and unifying metabolic pathways. (e) Apply their theoretical knowledge that they have acquired in finding solutions for specific practical problems.
SLSC303	Population approach: Population and communities as a regulatory unit	Upon successful completion of this course, the student will be able to: (a) List and describe the evidence for evolution and the mechanisms by which evolution occurs. (b) Provide detailed explanations of the processes of evolution by mutation, migration, genetic drift, non-random mating, and natural selection. (c) Identify major evolutionary transitions over time, and explain the tools and evidence that support current hypotheses of the history of life. (d) Solve basic biostatistics problems such as probability as well as describe the three statistical distributions. Differentiate between correlation and regression and solve problems related to them (e) Understand the use and apply basic Bioinformatics tools like Algorithms, Databases, Sequence alignments, Structure predictions, and visualization

SLSC401	Comparative Physiology	Upon successful completion of this course, the student will be able to: (a) Describe Thermal physiology and homeostasis during Stress (b) Understand the reproductive mechanisms in plants/animals and Host-Parasite Relationship (c) Explain the etiology, pathogenesis, clinical manifestations, diagnosis, therapy, prophylaxis, epidemiology and treatments of a few infectious diseases. (d) Appreciate the significance of published work in the field of Plant and animal physiology. Comprehend various stages of Clinical trials and their importance in deriving efficacy and safety (e) Learn the Basics of Immunology and defence mechanisms in Plants and animals
SLSC402	Life processes at the tissue, organ and organism levels: A Biochemical Approach	Upon successful completion of this course, the student will be able to: (a) Perceive all levels of the process of Gene Expression (Transcription and Translation) (b) Understand factors that could affect gene expression. (c) Comprehend the process and the importance of error-free DNA Replication (d) Recognise the process and importance of amino acid and fatty acid synthesis. (e) Understand the Composition & role of oxidative phosphorylation and photophosphorylation systems in cellular ATP synthesis
SLSC403	Population approach: population and communities as regulatory unit	Upon successful completion of this course, the student will be able to: (a) Understand Human Evolution and describe various aspects of Evolution and Society. (b) Explain adaptation, providing examples from several different fields of biology (c) Differentiate between the parametric and non-parametric tests (d) Apply biostatistical tests like ANOVA, z test, t test, chi square test for data analytics.

		(e) Conceptualise and apply Bioinformatics tools related to Gene, annotation, Gene expression, Phylogenesis.
SLSC501	Genetics & Immunology I	Upon successful completion of this course, the student will be able to: (a) Understand the concepts of linkage, recombination and gene mapping in phage and bacteria. (b) Comprehend the organization of genomes, Heterochromatin, Karyotyping, denaturation kinetics DNA, C-Value Paradox, Satellite DNA (c) Differentiate between innate and adaptive immunity, illustrate the cell types and organs involved in the process of the immune response, differentiate between humoral and cell mediated immunity. (d) Describe lymphocyte development and the expression of their receptors (e) Conceptualise the mechanism of antigen and antibody interactions and its application in diagnostic immunology
SLSC502	Developmental Biology & Neurobiology I	Upon successful completion of this course, the student will be able to: (a) Describe model organisms and landmark discoveries in research related to developmental biology (b) Understand Plant developmental biology with Arabidopsis as the model System (c) Conceptualise the events that orchestrate the development from a single cell to a multicellular organism in chick and human (d) Co-relate Neurological aspects of animal behaviour and imprinting in birds

		(e) Perceive concepts in relation to the parts of the nervous system, types of cells involved, neuronal communication. neuromuscular junctions, synapses, neurotransmitters.
SLSC503	Fermentation technology & Genetic engineering: A Biotechnological Approach I	Upon successful completion of this course, the student will be able to: (a) Understand the various concepts of fermentation (aerobic, anaerobic, batch vs continuous); Design a simple containment system (Bioreactor / fermentor). (b) Isolate and screen microorganisms with potential to produce particular metabolites. Enhance the efficiency of microorganisms to produce particular metabolites and produce the same at large scale. (c) Produce beer, wine, vinegar, cheese, yoghurt etc resulting from alcoholic and acidic fermentation. (d) Describe the use of restriction endonucleases in gene cloning and apply best suited Prokaryotic vectors in the process of gene cloning experiments. (e) Apply strategies of cloning, screening and selection methods.

SLSC504	Environmental Biotechnology I	Upon successful completion of this course, the student will be able to: (a) Articulate the interdisciplinary context of environmental issues, toxicology management. (b) Develop a sense of community responsibility by becoming aware of scientific issues in the larger social context along with its laws and regulations of the Indian constitution for the safeguard of Environment. (c) Learn about the biodiversity of the world by studying biomes, biogeographic zones, categories of IUCN and wildlife management. (d) Understand the basic sustainability concepts of homeostasis, carrying-capacity, recycling (e) Formulate an action plan for sustainable alternatives that integrate science, humanist, and social perspectives.
SLSC601	Genetics & Immunology II	Upon successful completion of this course, the student will be able to: (a) Understand the concept of recombination and gene mapping in Eukaryotes and Learn various tools used in molecular genetics and recombinant DNA technology and their applications (b) Comprehend and apply various types of mutations and mutagenesis methods (c) Correlate the relationship between malfunctions of the immune system and disorders such as autoimmunity, hypersensitivity, graft/host rejection and immunodeficiency. (d) Describe and understand the adverse effects of immune response hypersensitivity, auto immunity. (e) Understand the Principles and diagnosis of tumour immunology, mechanisms of transplant rejection, immunodeficiency disorders.

SLSC602	Developmental Biology & Neurobiology II	Upon successful completion of this course, the student will be able to: (a) Describe the cellular and molecular basis of development and genes involved during the early development and the applications of developmental biology in different fields related to treating various conditions and diseases. (b) Explain the basics of stem cell research and Explore the neurobiological basis of certain behaviours and diseases. (c) Have a clear understanding about the human sense organs, its transduction mechanisms and pathways. (d) Understand the mechanisms of Prostaglandin inhibition for pain management. (e) Discuss the structure of the reflex arc and mechanism of muscle contraction.
SLSC603	Fermentation technology & Genetic engineering: A Biotechnological Approach	Upon successful completion of this course, the student will be able to: (a) Understand the enzyme technology, the various methods of immobilization of enzymes (b) Evaluate factors that contribute in enhancement of cell and product formation during fermentation process (c) Provide examples of current applications of biotechnology and advances in the different areas like medical, microbial, agricultural, plant and animal tissue culture (d) Conceptualise cloning in eukaryotes and applications of recombinant DNA technology and related ethical issues (e) Stay abreast with recent tools used in genetic engineering and bioinformatics.

SLSC604	Environmental Biotechnology II	Upon successful completion of this course, the student will be able to: (a) Understand the basic sustainability concepts of Population changes, carrying- capacity, and various factors for the same. (b) Analyze the positive and negative impacts of urbanisation and causes of respiratory diseases. (c) Understand the application of alternative energy resources and energy efficient processes. (d) Learn the process of environmental auditing, data collection and the benefits of community participation . (e) Understand the perspectives and concerns related to safety and health hazards.

BIOTECHNOLOGY

PROGRAMME OUTCOME:

1. Knowledgeable about the latest developments in the field of Biotechnology and its current practices.
2. Technically competent to handle basic as well as few advanced instrumentations with an objective to be dexterous and efficient in execution of the task at hand.
3. A graduate is able to read and interpret scientific publications, formulate a research hypothesis and define research problems, design an experiment, collect, analyse and interpret data and draw logical conclusions based on observations and research findings.
4. A graduate leader with team spirit capable of innovative ideas that has a potential to generate employment opportunities and meet the needs of the society in terms of products and services.
5. Proficient in oral and written expression of ideas via clear and relevant justification, appropriate illustrations and scientific and graphical representation.
6. A graduate who appreciates values like Environmental preservation, conservation of resources, Sustainable Development.
7. Develop ability to innovate and create solutions through regular learning and updation of skills and knowledge in the subject and allied fields.

COURSE OUTCOME:

After completion of the course, students will be able to

Define different branches of Biotechnology.

Describe the importance of biotechnology and state the current scenario of biotechnology in India and globally.

Identify the products of different branches of biotechnology.

Recall the contribution of the Department of Biotechnology and other government research

Define terminologies: Bioremediation, Nanotechnology, Green technology, Biosensor, Cloning.
State the two Laws of Mendelian Genetics.
Discuss the concept of probability using a suitable illustration
Elucidate higher order packaging of chromosomes and their role in gene regulation.
Demonstrate gene mapping using Conjugation
Broadly classify plants, animals and microorganisms.
Choose appropriate techniques such as Field Gene Banks, Seed Banks, Pollen Banks, DNA
State IUPAC name and common names of organic compounds and draw their structures
Enlist IUPAC rules for the nomenclature of organic compounds
Summarize biological significance and industrial applications of some regular organic compounds
Calculate strengths of solutions in terms of standard quantities
Define theories of acids and bases and illustrate the concept of dissociation of compounds
Describe the make, principle, use and working of the instruments used in Chemistry laboratory
Summarize the structure based on Chargaff's Rule and understand the Watson and Crick model.
Recall the use of X-ray crystallography to determine the structure of DNA.
Interpret the genetic structure of the population by calculating genotypic and allelic frequencies.
Comment on whether populations are in Hardy-Weinberg equilibrium.
compare and contrast between: starch, glycogen, Peptidoglycan

Use a colorimeter to determine the absorption maxima of each extracted pigment.
Detect the activity of Amylase using Starch agar and *Bacillus* cultures
Separate and characterize different amino acids using paper chromatography.
Describe the process of polypeptide chain synthesis including initiation, elongation, and termination of the chain.
Analyse the difference between conventional and modern methods in research
& Frame a research problem
Isolate and identify lymphocytes from the whole blood sample using density gradient centrifugation
Describe Thymic development of TH cells
Discuss the advantages of M13 phages and phagemids as cloning vectors &
Explain the construction of a cosmid vector.
Summarise applications of Nano & Green chemistry to generate a greener alternative to existing commodities (biofertilizers, pesticides, biopolymers, etc).
Calculate the purity, yield and concentration of DNA in a given sample using a spectrophotometer.
Explain terms: Neoplasm, Benign, Malignant, Metastatic, Tumour suppressor gene, Oncogene, TATA, TSTA,
Learn data formats commonly used in bioinformatics.
Learn to use tools such as BLAST.
State basic principle for working of various analytical instruments like 2D electrophoresis, microchip and capillary electrophoresis, HPLC, GC, HPTLC, etc.
Outline meal plan for special needs of women such as pregnancy, lactation, individuals suffering from anemia, and PCOD/PCOS.
Understand the mode of action of various commonly used antibiotics.

Explain the terms: Tolerance, Autoimmunity, central and Peripheral Tolerance, Ag Sequestration,

Perform techniques to determine antibiotic susceptibility of microorganisms

MATHEMATICS

Program Outcomes:
The student will be able to

- Communicate mathematical ideas effectively.
- Apply mathematical methods and procedures in the Mathematical related fields.
- Use software to aid in problem solving.
- pursue higher studies and research.
- Get awareness towards professional ethics and responsibility.

Course objectives:
The courses offered are aimed at

- Developing skills and understanding the fundamental concepts which are necessary to pursue higher studies.
- Developing logical and critical thinking.
- Appreciating the usefulness and power of Mathematics.
- Enjoying the beauty of Mathematics.

PHYSICS

1. Program Learning Outcomes or PLO

Graduates will be able to:

1. **Analyse** various scientific and research problems.
2. **Manage** research work and **design** of experimental setups/electronic circuits/theoretical problems.
3. **Compare/ differentiate** between the formulation/ applications of the laws of Classical as well as Quantum Physics through scientific reasoning.
4. **Apply** the physics principles to explain natural and physical phenomena.
5. **Exhibit** professional ethics and norms of scientific development.
6. **Communicate** effectively in both verbal and written forms.
7. **Function** individually and in teamwork.
8. **Practice** the use of lifelong learning of physics.
9. **Use** modern ICT tools and softwares/simulators, and programming languages.
10. **Comprehend** and **apply** the physics knowledge in competitive exams at national/international levels.
11. **Apply** their responsibilities in the societal context.

2. **Course Learning Outcomes or CLO**

Mechanics and Thermodynamics Paper (SPHY101)

1. **Apply** Newton's laws, write the balance of force and solve the equation of force
2. **Apply** first law of thermodynamics to physical situation and study the effect
3. **Use** of fluid dynamics Enhance problem forming and problem solving skills

Vector calculus -I and modern physics (SPHY102)

1. **Differentiate** between scalar and vector fields.
2. **Apply** divergence and curl of vector fields to physical situations.
3. **Describe** the properties of nuclei.
4. **Calculate** the decay rates and lifetimes of radioactive elements.
5. **Apply** radioactive concepts for understanding carbon dating and age of earth,
6. **Develop** quantitative problem solving skills for competitive exams.
7. **Comprehend** the failure of classical physics and need for quantum physics.
8. **Grasp** the basic foundation of various experiments establishing quantum physics.

Electricity and Electronics (sphy202)

1. Explain and analyse basic electrical network theorems.
2. Explain basic electronic components and use them to design simple electronic circuits
3. Draw input output characteristics of CB, CE,CC mode
4. Recognizes half-wave, full-wave and bridge rectifier circuits and explains the operation of these circuits.
5. Explain the amplification in amplifier circuits with transistors.
6. Design simple electrical and electronic circuits
7. Calculate current through load resistance in a complicated network using DC network theorems
8. Draw and analyse the DC load line of a transistor.
9. Analyse and simplify electrical networks by applying principles of mathematics and physical science.

1. **APPLIED PHYSICS-I (SPHY303)**
2. List applications of optical fibre
3. List applications lasers
4. Describe properties of laser beam
5. Define reverberation time
6. Classify different types of optical fibres
7. Explain absorption and spontaneous and stimulated emission in two level systems.
8. Describe the working of He-Ne laser
9. Distinguish between three level and four level pumping schemes
10. Derive Sabine's formula to determine unknown absorption coefficient

Optics and Digital Electronics (SPHY401)

1. **Comprehend** the concepts of diffraction, polarisation and digital circuits.
2. **Apply** them in their observations/experiments.
3. **Analyse** research problems involved in optics and binary arithmetic.
4. **Communicate** real life applications of optics and digital electronics through ICT tools.
5. **Practice** in preparing for competitive examinations.

Atomic and molecular physics(SPHY503)

1. **Interpret** applications of quantum mechanics in atomic physics.
2. **Construct** space quantization, energy spectrum and energy level diagrams.
3. **Discuss** the effect of magnetic fields on atoms.
4. **Differentiate** between rotational, electronic , Raman and microwave spectroscopy.
5. **Apply** spectroscopy for IR, microwave and Raman Instrumentation.
6. **Comprehend** molecular physics and its applications.
7. **List** electronic configuration of elements.
8. **Develop** problem solving skills for competitive examinations.

Electronics PHY502

1. **Understand** the different types of semiconductor devices like JFET, MOSFET, SCR, TRIAC and DIAC used in modern electronics
2. **Analyse** the circuits made from these semiconductor devices.
3. **Create** the circuits using simulations or in the lab.
4. **Recognise** the importance of these devices in the modern world.

Electrodynamics PHY504

5. **Learn** special techniques to solve problems in electrostatics such as Gauss law, Laplace's equations, Method of images
6. **Analyse** the effect of electromagnetic fields in material medium
7. **Understand** Ampere's Law for magnetised materials, Maxwell's equations, displacement current and magnetisation
8. **Apply** Maxwell's equations to obtain electromagnetic wave equation, energy and momentum.
9. **Describe** the properties of magnetic materials
10. **Calculate** the magnetic fields and magnetisation of magnetised materials.

Mathematical physics , waves and oscillations(SPHY201)

1. **Understand** the basic mathematical concepts.
2. **Apply** differential equations for physical situations.
3. **Recognize** and use a mathematical oscillator equation and wave equation
4. **Comprehend** the principle of superposition of waves.
5. **Describe** several phenomena which we observe everyday that can be explained using wave phenomena

6. **Differentiate** between various types of waves
7. **Construct** Lissajous figures
8. **Develop** problem solving skills for competitive examinations

Vector Calculus and Analog Electronics (SPHY302)

1. **Comprehend** the basic concepts in vector differentiation, vector calculus, spherical and cylindrical coordinates.
2. **Apply** these concepts in various problems in Physics.
3. **Understand** the methods of transistor biasing and types of amplifiers and oscillators and feedback.
4. **Characterise** the properties of OP-AMPS
5. **Distinguish** the different types of amplifiers, oscillators and OP-AMP configurations.
6. **Practice** the concepts learned in the laboratory as well as real-life situations

Nuclear Physics(SPHY603)

1. **Understand** nuclear structure.
2. **Derive** the properties of nucleus from various nuclear models
3. **Formulate** theory of alpha , beta and gamma decay
4. **Develop** basic knowledge of elementary particles and quark model
5. **Differentiate** between fusion and fission
6. **Construct** decay schemes
7. **Compare** particle accelerators

BOTANY

Program Outcomes:

- The student graduating with the Degree B.Sc Botany should be able to acquire:

1. **Core competency in taxonomy:**

- The **student will be able to identify and classify** major groups of plants and compare the characteristics of **lower** (e.g. algae and fungi) and **higher** (angiosperms and gymnosperms) **plants**.

2. **Plant metabolomics**

- The students will be able to **explain various plant processes and functions.**

3. **Phylogenetic analysis:**

- Students will be able to use the evidence based knowledge of botany to **explain the evolution of organisms and understand the genetic diversity on the earth**.

4. **Adaptations and their implications :**

- Students will be able to **understand adaptation, development and behaviour of different forms of life**.

5. **Laboratory skills:**
   Students will be able to **demonstrate the experimental techniques and methods of their area of specialization in Botany**.
6. **Understanding environment sustainability:**

- The understanding of **interconnected life on earth** and **tracing their energy pyramids through nutrient flow** is expected from the students.

7. **Analytical ability**:

- The students will be able to demonstrate the knowledge in **understanding research and addressing practical problems.**

8. **Research skills:**

- Application of various scientific methods to address different questions by formulating the hypothesis, **data collection and critically analyzing the data** by applying the **appropriate statistical tests** to support their hypothesis**.**

9. **Critical Evaluation skills**

- An increased understanding of fundamental concepts and their **applications of scientific principles** is expected at the end of this course.

10. **Problem solving skills:**

- Students will become **critical thinkers and acquire problem solving capabilities**.

11. **Digitally equipped:**

- Students will **acquire digital skills** and integrate the **fundamental concepts with modern tools.**

12. **Ethical and Psychological strengthening:**

- Students will also **strengthen their ethical and moral values with respect to avoiding plagiarism** and shall be able to **deal with psychological weaknesses.**

13. **Team Player:**

- Students will learn **team workmanship** in order to efficiently serve institutions, industry and society.

14. **Independent Learner:**

- Apart from the subject specific skills, generic skills, especially in botany, the program outcome would lead to **gain knowledge and skills for further higher studies, competitive examinations and employment.**

15. **Employability:**

- Learning outcomes based curriculum would **ensure equal academic standards** and **career avenues globally.**

Course Outcomes:

- **Semester 1 Paper 1 CLO**
- Students will be able to
- Differentiate and compare between members of Chlorophyta and Cyanophyta
- Discuss life cycles and systematic position of algae belonging to prescribed in the syllabus

- Suggest solutions for sustainable agriculture/healthy lifestyle.
- Differentiate and compare between members of Phycomycetes.
- Discuss life cycles and systematic position of fungi prescribed in the syllabus
- Differentiate between different Modes of nutrition in fungi.
- Analyse the diseases caused by fungi and provide a suitable solution.
- Differentiate between types of lichen thallus on the basis of their external-internal structure , habitat and fungal partners.
- Assess and understand the economic and ecological significance of lichens.
- Comment on the principle, working and different parts of a simple and compound microscope.

- **Semester 1 Paper 2 CLO**
- Students will be able to:
- Apply the concept of gene interaction to phenotypes observed.
- Analyse the influence of the environment on phenotypic expression.
- Apply theoretical knowledge for the betterment of the environment.
- Evaluate, Analyse the environmental problems and apply solutions along with adaptive plants in respective areas.
- Differentiate between primary and secondary metabolites.
- Comment upon commercial uses of Primary and Secondary metabolites covered in their syllabus.

- **Semester II Paper 1 CLO**
- Learning Outcomes:
- Students will be able to
- Understand the morphological, anatomical and reproductional peculiarities of Plants belonging to Hepaticae.
- Identify and classify Plants belonging to Hepaticae.
- Compare and differentiate between Plants belonging to Hepaticae.
- Comment on the economic importance of Bryophytes.
- Describe various stages of life cycle in Riccia and Marchantia
- Understand the morphological, anatomical and reproductional peculiarities of Plants belonging to Lycopsida.
- Identify and classify Plants belonging to Lycopsida.
- Comment on the economic importance of Pteridophytes.
- Describe various stages of life cycle in Selaginella
- Understand the morphological, anatomical and reproductional peculiarities of Plants belonging to Coniferopsida.
- Identify and classify Plants belonging to coniferopsida.
- Compare and differentiate between Plants belonging to coniferopsida
- Comment on the economic importance of Coniferopsida.
- Describe various stages of life cycle in Thuja and Araucaria
- Justify classification of gymnosperms by C. J. Chamberlin.
- Define taxonomy and enumerate the aims of taxonomy
- Apply the knowledge of basic floral morphology in identification of plants.
- Comment on parts of typical flower i.e. essential and non-essential whorls.

- Classify the plants according to Benthem and Hooker's classification.
- Comment on the economic importance of plant families studied
- Relate different plants with respect to placentation of seeds in fruits
- Decipher the morphological characters from the given floral formula.

- **Semester II Paper 2 CLO**
- Learning Outcomes:
- Students will be able to
- Comment on functions of various types of basic tissue systems present in plants.
- Give significance to various adcrustations; incrustations; ergastic substances; laticifers; lithocysts etc.
- Compare and contrast between primary structures in roots; stems and leaves of dicotyledons and monocotyledons.
- Identify and describe different types of trichomes and stomata in plants
- Understand the importance of epidermis and the epidermal tissue system.
- Enlist the functions of epidermis.
- Identify and comment on various structural and storage polysaccharides.
- Comment on ultrastructure of chloroplast.
- Diagrammatically represent the light harvesting mechanisms in plants.
- Classify, compare and differentiate between different types of carbohydrates.
- Understand the basic concept of light harvest mechanism.
- Enlist and give the role of the different photosynthetic pigments found in plants.
- Understand and Compare the different pathways of carbon fixation and classify plants based on the same.
- Describe the process of photorespiration.
- Analyze the impact of photorespiration in agriculture
- Define ethnobotany and comment on various sources of data and methods of study in ethnobotany
- Comment on the traditional knowledge for use of medicinal plants for various ailments and as antidotes.
- Suggest edible plants for use during famines and other natural calamities.
- Apply the knowledge of identification of toxic plants and their products in various fields.
- Design various experiments to prove the efficacy of ethnobotanical data.

- **Semester 3 Paper 1 CLO**
- Students will be able to
- Differentiate and compare between different classes of algae from their syllabus.
- Understand life cycles and systematic position of algae prescribed in the syllabus
- Analyse and comment upon the economic importance of algae with the help of case studies.
- Comment on methods of preservation for plants.
- Differentiate and compare between different classes of fungi from their syllabus.
- Understand life cycles and systematic position of fungi prescribed in the syllabus
- Analyse and comment upon the economic importance of fungi with the help of case studies.
- Identify the causal organism and give remedial measures for pathological symptoms on

plants

- Understand the importance and correlation of the different eras in geological time scale.
- Identify different fossils prescribed in the syllabus with the help of macro and micromorphology.
- Understand the evolution of plants and their fossils
- Explain different types of fossilisation processes.
- Apply the knowledge of palaeobotany with respect to coal and oil exploration.

- **Semester 3 Paper 2 CLO**
- Students will be able to:
- Comment on the role of different parts of the colorimeter.
- Differentiate between a spectrophotometer and a colorimeter.
- Justify Beer Lambert's law using colorimeter/spectrophotometer
- Understand and apply the knowledge of chromatography for separation of plant metabolites.
- Discuss the principle behind the technique of centrifugation and its applications.
- Summarize different types of centrifuges.
- Summarize different types of centrifugation techniques.
- Apply the knowledge of centrifugation for separation of cell components and / or fractionation of subcellular organelles
- Predict the genetic disorder from the human karyotype under study.
- Judge the impact of chromosomal aberration on gametes formed by the affected organism.
- Relate the association of morphological and anatomical abnormalities observed in an organism with changes in its chromosomal structure.
- Guess the consequences of such abnormalities on the offspring due to formation of defective gametes.
- Realise that determination of sex of an organism could be based on either genotypic determination or X chromosome-autosome balance system determination or genic sex determination.
- Comment and Distinguish between various methods of sex determination in different organisms.
- Differentiate between sex linked, sex influenced and sex- limited traits. They also realise that secondary sexual characters can also result due to effect of genes present on the autosomes and may not always be on the sex chromosomes.
- Realise that inheritance of extranuclear genes follows rules different from those for nuclear genes and is generally maternal or uniparental inheritance.
- Describe ultrastructure and role of important cell organelles like nucleus and vacuoles.
- Understand the details of organisation of DNA in prokaryotic and eukaryotic chromosomes.
- Comment on packaging of eukaryoticDNA into chromosomes.
- Discuss types & role of histones in packaging of DNA.
- Understand the detailed process of DNA Replication both in prokaryotes and eukaryotes.
- Comment on similarities and differences observed in the enzymes involved and process of DNA replication in both Prokaryotes and Eukaryotes.

- **Semester 3 Paper 3 CLO**
- Students will be able to
- Differentiate between substitutes and adulterants/ regional and seasonal variations in phyto-constituents.
- Comment the importance of proximate analysis/organoleptic evaluation of crude drugs
- Understand the monographs prescribed in their syllabus.
- Understand and Apply the knowledge to differentiate regions into different types of forests and their relevance to nature and mankind.
- Understand and Comment on the economic aspects of the forest products.
- Understand and Comment on the industrial and economic aspects of different plant based products.

- **Semester 4 Paper 1 CLO**
- Students will be able to
- Differentiate between plant groups belonging to Bryophytes, Pteridophytes, Gymnosperms
- Enlist economic importance for these plant groups will help students understand the potential use of each group.
- Apply the knowledge of inflorescence morphology in identification of plants.
- Classify plants according to the floral morphology and adaptations exhibited by the plants.
- Comment on the economic importance of plant families from the syllabus.
- Compare and contrast between the plant families prescribed in the syllabus
- Understand the Bentham and Hooker's system for classification of plants.

- **Semester 4 Paper 2 CLO**
- Students will be able to
- Describe the process of secondary growth in plant organs.
- Discuss the importance of the mechanical tissue system in plants.
- understand the importance of defence mechanisms in the plants.
- Elaborate the role of conducting tissue system in plants
- Relate Secretory and glandular tissue systems with other tissue systems in plants.
- Identify the different types of wood/timber with the help of wood anatomy.
- With the study of this unit of physiology students will understand all basic interconnecting links between photosynthesis, respiration and photorespiration. They will also have in-depth knowledge of structures of molecules (carbohydrates) which are the photosynthetic products and respiratory substrates.
- Grasp the basic concepts in ecology of soil formation and its related factors and they will understand the concept of community ecology
- sensitized about the types of pollution and their impact on environment. Case studies will help them relate to environmental issues across the globe.

- **Semester 4 Paper 3 CLO**
- Students will be able to
- The PTC unit will make the students aware of the various techniques followed in setting up a lab, making a medium, sterilising for aseptic conditions and various types of

culturing techniques. After studying the topics, students will also be well versed with taking the plants from lab to land and how in vitro propagation can improve food crops.
- The gene cloning unit will introduce students to the fascinating topic on genetic engineering. They will understand the strategies involved in gene cloning using different types of vectors as well as the role played by some important enzymes involved in recombinant DNA technology.
- The student will use the basics studied about research in their academics for conducting projects and present them.

- **Semester 5 Paper 1 CLO**
- Students will be able to:
- Identify the different types of organisms and their growth characteristics.
- Master culturing techniques of microbes Master the antibiotic sensitivity tests
- Grasp the concept of fermentation using appropriate examples.
- Differentiate between marine and freshwater algae
- Understand life cycles of algal and fungal specimens [as per the syllabus] and classify the same
- Comment on the economic importance of Algae and Fungi
- Apply the knowledge gained to identify pathological symptoms on plants and suggest appropriate prophylactic measures for the same
- Understand different classes of bryophytes and also understand its evolutionary aspect and apply knowledge for its ecological significance.

- **Semester 5 Paper 2 CLO**
- Students will be able to:
- Comment recent trends in systematics Study of morphological characters will help them to easily identify the field plants.
- Apply the knowledge of morphology in identification of plants as per Bentham and Hooker's (Natural) system of classification.
- Enumerate plants of economic importance from the prescribed families.
- Compare and differentiate amongst various types of anomalous anatomical structures in plants.
- Identify pollen grains based on morphology using the NPC system of classification.
- Apply the knowledge of palynology in various fields prescribed in the syllabus and suggest a few measures to cure or control pollen allergy.

- **Semester 5 Paper 3 CLO**
- Students will be able to:
- Understand the detail process of protein synthesis (transcription and translation) in both prokaryotes and eukaryotes along with post transcriptional modifications occurring in eukaryotic cells during protein synthesis.
- Understand the concept of transport of solutes in plant systems, the structure and role of various types of anatomical structures involved in mechanism of translocation of metabolites.
- Understand plant physiological responses to light absorption by various photoreceptors.
- Understand the physiological role and mechanism of production of secondary metabolites

in plants and use of these important phytochemicals for benefit of mankind

- Understand and comment on different methods of bioremediation and apply the knowledge to combat the major current day problem i.e. pollution.
- Understand the transition of landform over the period of years due to environmental impact.
- Understand the concept of carbon sequestration, carbon emissions, carbon sinks and carbon capture and storage.
- Understand and comment on the importance of Post Kyoto agreements on climate change.
- Understand and analyse the various types of environmental effects of toxic substances like eutrophication, bioaccumulation and biomagnification.
- Creating sensitisation towards the problems faced in the environment and to analyse the solutions to avoid causing harm to ecosystems.

- **Semester 5 Paper 4 CLO**
- Students will be able to
- Master the technique of column chromatography and apply the same for the separation of specific plant metabolites depending on its properties.
- Use their knowledge of biotechnology and bioinformatics to understand current research articles on most recent developments in recombinant DNA technology. They will also understand its applications in the field of evolutionary studies, medicine and forensic science.
- Understand the significance and construction of genomic, chromosomal and c- DNA libraries and will be able to differentiate between these.
- Understand the various ways in which DNA molecules are analysed in molecular biology experiments. They will be familiar with methods and principles involved in identification and analysis of cloned DNA or its transcripts using colony hybridisation, antibody probes, southern hybridisation, Autoradiography, as well as restriction mapping.
- The students will learn how to culture plant cells in vitro in liquid medium, how this culture is maintained and what are the methods, advantages and disadvantages.
- Students will learn the various methods to enhance secondary metabolite production in vitro via techniques of elicitation and biotransformation
- They will study and understand techniques like virus elimination, synthetic seed production and commercial production of secondary metabolites. This will be promoting ideas of start-up.

HISTORY

Programme Learning Objectives (PLO) for B.A in HISTORY

PLO 1. Provide a comprehensive understanding in the discipline of History pertaining to Early India, its political, economic and social history and historiography, on Medieval History and in regional history, History of Marathas in the social, political and economic aspects and on Modern India period, its historiographical approaches, on Contemporary India its political developments, economic policies, social movements and foreign policy of India
PLO 2. Build critical understanding on research and historiography with respect to different

approaches to writing History and critical theories for historical analysis
PLO 3. Provide a perspective on Contemporary World and developments in Asia-political developments and major human rights movements and trends in international politics
PLO 4. Build skills in in Archaeological methods, Museum and Archival sciences.
PLO 5. Build an ability in critical historical reading, interpreting narratives and contextual analysis of historical events.
PLO 6. Foster analytical and critical thinking abilities and build a multidisciplinary approach for problem solving and decision making by giving due importance for lateral thinking
PLO 7. Develop communication and presentation skills, problem solving skills, team skills, organisational skills and leadership skills.
PLO 8. Inculcate sensitised approach to existing gender and social inequalities and feminist writings and adopt a multicultural and inclusive approach
PLO 9. Create Awareness about Human Rights movements, subaltern and Post-colonial historical trajectories.
PLO.10. Promote employability skills like building civil services competitive skills, research competencies, preservation techniques, Interpretation of scripts
PLO.11. Build an awareness and encourage commitment on Heritage, Culture and on Sustainability.
PLO.12. Ability to use survey tools in research, literature review and research paper format
PLO.13. Provide digital skills, data analysis and social media marketing skills and training in brochure designing, tour packaging and marketing for the travel sector and blogging in general
PLO 14. Apply critical thinking skills, research skills and domain knowledge to various issues in the contemporary world and on any research assignments.
PLO15.Apply blog writing skills on topics related to history/travel, art or heritage and prepare Travel brochures and travel itineraries.

Programme Learning Outcomes (PLO/PSO) for B.A in HISTORY

After completion of the Program, students will be able to-

PLO 1. Comprehend the major historical developments pertaining to the Early Indian period, Medieval History of India, regional History of Marathas, Modern Indian period, Contemporary India and trace the social, political and economic aspects, its various historiographical approaches, social movements and the foreign policy of India in contemporary India.
PLO 2. Build critical understanding on research and historiography with respect to different approaches to writing History in a given historical period and the critical theories for historical analysis
PLO 3. Develop a perspective on Contemporary World and developments in Asia-political developments and major human rights movements and trends in international politics
PLO 4. Apply critical historical reading, interpret narratives and contextual analysis of historical events and articulate on the same
PLO 5. Apply analytical and critical thinking abilities and build a multidisciplinary approach for problem solving and decision making, by giving due importance for lateral thinking
PLO 6. Synthesise communication and presentation skills, team working skills, organisational skills and leadership skills.

PLO 7. Apply a sensitised approach to existing gender and social inequalities and feminist writings and adopt a multicultural and inclusive approach
PLO 8. Understand relevance about Human Rights movements, the subaltern and post-colonial historical trajectories.
PLO.9. Apply employability skills for qualifying for the civil services exams, research competencies, preservation techniques and interpretation of scripts
PLO 10. Apply digital skills, data analysis and social media marketing skills.
PLO.11. Inculcate commitment on Heritage, Culture and on practising Sustainability.
PLO.12. Apply survey tools in research, literature review and research paper format
PLO.13. Apply skills in brochure designing, tour packaging and analyse/create marketing strategies for the travel sector
PLO 14. Apply analytical thinking skills, research skills and domain knowledge to various issues in the contemporary world and on any research assignments.
PLO15.Apply blog writing skills on topics related to history/travel, art or heritage

1. **History of Early Modern India (1757-1857)-AHIS101**

CLO 1. Discuss/Explain the various facets of colonialism in India with special reference to British Colonialism in India and its distinct phases, events, personalities and people.

CLO 2. Map the impact of the various policies of the British rule in India.

CLO 3. Write a critique on the role of various Governor Generals in strengthening British paramountcy in India.

CLO 4. Use / Apply interpretative skills to access various newspapers to project the role of press in the Indian National movement.

CLO 5. Trace the role of British Government in the development of education in India

CLO 6. Draw a comparative study of the transportation and communication system under the British regime with contemporary India.

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2. **History of Modern India (1858 - 1947)-AHIS201**

CLO 1. Interpret historical arguments with regard to the emergence of nascent nationalism in India/ movements/ trends that have left implications and challenges in contemporary Indian society.

CLO 2. Examine the political changes in Europe and its impact on the Indian young elite.

CLO 3. Trace the genesis of communalism in Colonial India and its impact on the course of harmonious conditions in India.

CLO 4. Draw a road map to the evolution of the constitution of India.

CLO 5. Apply the knowledge of Historical trajectories to the status of women/Dalits/tribal's /peasants/workers in contemporary India.

CLO 6. Analyse the events and players inducing partition of India and evaluating its aftermath.

CLO 7. Make a comparative study of the various colonial powers in India.

CLO 8. Evaluate the role of Japanese militarism in the liberation movement of India

3. **Landmarks in World History (1453 -1919)-AHIS301**

Course Learning Outcome: At the end of the course the student will be able to

CLO 1. Examine the spirit of Renaissance and its role in modernisation of Europe and the world.

CLO 2. Make a comparative study of the conditions in India and that of Europe in the 15th century.

CLO 3. Present arguments to support the view that the Protestant Reformation of Europe impacted the social religious movement of India.

CLO 4. Present views on the significance of reason and science for the progress and development of a nation in the light of the Renaissance movement of Europe with reference to the growth of nationalism.

CLO 5. Analyse and portray the struggle of mankind to assert natural rights in the 18th century through revolutions.

CLO 6. Distinguish between the American, the French and the Russian revolutions.

CLO 7. Interpret the impact of the Unification of Germany and the Unification of Italy in arousing nationalism in India.

CLO 8. Assess the impact of World War I on the social life of the world in general and of Europe in particular.

4.Early Indian History (Stone Age to c. 326 BCE)-AHIS302

CLO 1. Understand the History of India from Stone Age to 326 BCE and explore the state formation, economic growth, societal and cultural developments in the period from Stone Age to 326 BCE through various readings and approaches adopted by the historians

CLO 2. Understand various sources for the study of early India and their limitations

CLO 3. Analyse how a geographical notion of India was developed and how History has been a source for constructing the identity

CLO 4. Apply the knowledge of Early Past of India to understanding the social and cultural legacies in current times and develop insights

CLO 5. Able to create research projects and blogs in the historical period under study by using recent interdisciplinary approaches on the past

Q5. Please provide any information regarding Mentoring done in your department for the students.

5. INTRODUCTION TO TRAVEL & TOURISM-AHIS3AC1

CLO 1. Trace the evolution, growth and development of Travel and Tourism in the world in general and in India in particular.

CLO 2. Propose safety measures to the Government in order to ensure the safety of tourists at a destination.

CLO 3. Apply the use of the diverse Social and Electronic Media tools in popularising a tourist destination.

CLO 4. Analyse the different factors that motivate the tourist while determining travel plans.

CLO 5. Enumerate the need and importance of infrastructure for the tourism industry.

CLO 6. Suggest different ways by which optimum Utilisation of Infrastructure can be used in popularising a tourist destination

CLO 7. Make a comparative study of the various Ancillary and Supplementary services required by the tourist.

CLO 8. Draw a plan for sustainable tourism in a State.

CLO 9. Highlight precautions to be taken by tourists while travelling to a particular destination.

CLO 10. Suggest measures for the optimum development of the economy of a destination through tourist activities.

CLO 11. List the tourist activities to be refrained from in order to reduce/minimise its impact on environment and culture .

6.Landmarks in World History (1920 -1950)-AHIS401

CLO 1. Distinguish between Kemal Pasha of Turkey and Reza Shah Pahelvi of Iran as modern Muslim politicians of the early 20th century.
CLO 2. Write a critique on the performance of the present leadership in Turkey and Iran with reference to the reforms of Kemal Pasha and Reza Shah.
CLO 3. Interpret historical arguments to explain the Arab Israel conflict.
CLO 4. Explain the Zionist movement and its implications on the present situation in Palestine.
CLO 5. Trace the significant political dealings in the world during the interwar period that shaped the destiny of world history.
CLO 6. Analyse the rise, growth and role of the dictatorial regime and its subsequent impact.
CLO 7. Draw a plan for future discourse between nations on the basis of the aims and objectives of the United Nations to ensuring World peace and harmony.
CLO 8. Draw a comparison between the Imperial techniques of the19 th century and the techniques of globalisation.
CLO 9. Distinguish between the nationalist struggle of India and Burma/Indo China/Indonesia/China.
CLO 10. Write a critique on the Dutch/Japanese/French imperialism in Asia.
CLO 11. Compare the ascent of imperialist Japan in the 20th century and its upsurge as an economic power post World War II.

7. Early Indian History (326 BCE-1000 CE)-AHIS402

CLO 1. Gain an understanding on the History of Early India from the rise of the Mauryan Empire to about 1000 CE and the process of state formation leading up to the emergence of empires in the north and the kingdoms in the south

CLO 2. Analyse critically the political developments and will be able to identify the economic trends, inspirations and impact of thought and practices existent in the society, culture and religion and the impact on art and iconography.

CLO 3. Apply the knowledge of History of Early India in questions in the competitive exams, NET exams, in research assignments and for further studies in Post-Graduation in History

CLO 4. Evaluate and compare various historiographical approaches to the study of Early India, different periods and the trends in the given historical period.

CLO 5. Create and undertake newer researches in polity, society, economy and art

8. Introduction to Travel & Tourism-AHIS4AC1

CLO 1. Describe the different phases in the planning process essential to achieve the goals of the tourism industry.
CLO 2. Discuss the performance of Integrated Marketing Communications Systems in travel industry.
CLO 3. Bring out the role of tourist organisations in the growth of tourism.
CLO 4. Make a Comparative Study between the Travel Agent and Tour Operator with special reference to the role played by them.
CLO 5. Explore the relevance documentation to the tourism industry and analyse the difficulties faced to maintain it.
CLO 6. Make a travel brochure, travel Itinerary to a destination of your choice/ as per tourist requirement.
CLO 7. Suggest measures to overcome the drawbacks of the present tourism policy at the State and National Level.
CLO 8. Draw a Plan to build a strong connection between National and International Tourism Organisation.

9. History of Early Medieval India (1000 CE- 1526 CE)

CLO 1. Distinguish between the Indian expeditions of Mahmud of Ghazni and Mohammed Ghori.
CLO 2. Provide historical views to present the liberal personality of Iltutmish.
CLO 3. Draw a comparative study of the status of Muslim women with reference to Razia Sultan and present views on the present status of Muslim women in India.
CLO 4. Project Alauddin Khilji's Chittor expedition in the light of Muhammad Jayasi's Padmavat.

CLO 5. Present the uniqueness of the Sultanate administration that provided stability and prosperity to the Delhi Sultanate.
CLO 6. Identify the role of Sufi saints in spreading Islam in India.
CLO 7. Point out the similarities and dissimilarities in Sikhism and Hinduism.
CLO 8. Classify the different styles of calligraphy introduced by the Delhi Sultanate.
CLO 9. Appreciate the heritage found in the different architectural styles of the Delhi Sultanate, Vijaynagar empire and the Bahamani Kingdom.

10. History of Contemporary India (1947-2000)-AHIS502

CLO1. Describe significant socio-economic and political developments in post -independence India and examine critical perspectives on the same
CLO.2Analyse the shaping of the political institutions, socio-economic reforms in the initial years and initiatives under various Prime Ministers in India since 1947 till 2000
CLO3.Analyse and evaluate the role of various parties, the shifts in the political culture from the latter half of 1960s and the rise of opposition parties, both left and right wing in India and their policies between 1947 to 2000.
CLO4.Understand and analyse the economic policies of India and probes into the shifts and changes following the adoption of policies of liberalization.
CLO5.Evaluate the coalition and majoritarian governments and their impacts
CLO6.Analyse the developments in education, science and technology since 1947
CLO7.Analyse the Feminist struggles, class and caste-based struggles and challenges in contemporary India
CLO8. Formulate, sustain and justify a historical argument.
CLO 9. Create a solutions-based thinking on the current social dynamics and economic and political challenges in the country

11. Introduction to Indian Archaeology-AHIS503
Course Learning Outcome: At the end of the course the student will be able to

CLO 1. Trace the evolution and the development of Archaeology in India and its contribution for the study of history.
CLO 2. Comprehend the relation of archaeology with other social sciences.
CLO 3. Analyse the role of metal technology in developing human societies.
CLO 4. Examine the relevance of material culture beyond political history.
CLO 5. Outline the different Phases and make a comparative Study of the Palaeolithic, Mesolithic, Neolithic, Chalcolithic and Early Historical Period.
CLO 6. Review the development of Epigraphical studies in India during the 19^{th} and 20^{th} century.
CLO 7. Evaluate the significance of epigraphy for the study of political, social and economic life of people.
CLO 8. Interpret the different types of inscriptions and Scripts for the

reconstruction of History.

CLO 9. Make a Comparative study of the Coinage of the different dynasties in the Indian History.

CLO 10. Discuss the different career opportunities in the field of Archaeology Epigraphy and Numismatics.

12.History of The Marathas (1630 -1707)-AHIS504

CLO 1. Bring out the significance and contribution of literary sources to the reconstruction of Maratha history.

CLO 2. Map out the geographical conditions of Deccan in the 17th century.

CLO 3. Present Historical interpretations to explain the role of Shahaji in the establishment of Swarajya.

CLO 4. Write the changing nature and significance of Maharashtra Dharma from 17th to 21st century and its implementation in the present day politics.

CLO 5. Apply Knowledge about Shivaji's strategy, diplomacy and statesmanship qualities to present views on Shivaji's contribution in the creation of Maratha Swarajya.

CLO 6. Draw a comparative study between Chhatrapati Shivaji Maharaj's Ashtapradhan Mandal and the present-day Cabinet of Ministers.

CLO 7. Point out the similarities and dissimilarities between Maratha Military system and Mughal Military system

CLO 8. Present a critique on Tarabai as a Maratha warrior queen and a statesman.

13. History of Contemporary World-AHIS505

CLO 1. Understand and examine the major political events, manifestations of various ideological struggles, emergence of newer political entities such as the EU, the rise of US unipolarity and challenges to it, human rights struggles and the new features in international Politics since 1990 and the impacts

CLO 2. Analytical skills on how to study a particular historical development in the international sphere, examine various aspects and form one's own opinion on the same.

CLO 3. Understand and analyse a deeper understanding on theorization aspects and grassroots struggles in the areas of human rights in various parts of the world whether with respect to equality of race, nations or gender especially in the USA, South Africa and in international arena post-decolonization.

CLO 4. Apply the knowledge of Contemporary World while working on research projects and

CLO 5. Analyse and apply the knowledge of vulnerabilities in the International, challenges through Communication revolution and apply the principles of sustainability in everyday life

The Mentoring is done to the Students at

14. Research Methodology and Approaches to History I-AHIS506

CLO1.Understand the basics and important concepts in Research and the Research Process and important aspects of writing a Research Paper
CLO 2. Apply knowledge of conducting literature review, surveys and citation tools while on research projects
CLO 3. Analyse the philosophy of History and its evolution, approaches to historiography and the application of critical theories in history writing
CLO 4. Apply the knowledge of research in conducting research and writing papers
CLO 5 Create awareness on new techniques of historical analysis

15. History of Later Medieval India (1526 – 1739) -AHIS601

CLO 1. Write on the Tulughama war strategy of Babur that led to his victory in the First Battle of Panipat.
CLO 2. Make a comparative study to assess the contribution of different Mughal rulers to India.
CLO 3. Analyse the forces and factors that steered the decline of Mughal rule in India.
CLO 4. Trace the legacy of the earlier Medieval Indian rulers visible in the Mughal administration.
CLO 5. Write a critique on Akbar's Din-i-Illahi.
CLO 6. Comprehend the Mughal Maratha relations from 1630-1707.
CLO 7. Distinguish between Dar-ul harb and Dar-ul-Islam.
CLO 8. Draw a comparison between the edifices of Akbar and Shah Jahan.
CLO 9. Trace the changes under Mughal rule in music with reference to darbar singing.
CLO 10. Bring out the impact of Akbar's Rajput policy on social and cultural life of India.
CLO 11. Explain the heterodoxy of religion and stratification of the society during the Mughal rule.
CLO 12. Identify the Panchim kaari and Meena Kaari work of the Mughal period.
CLO 13. Appreciate the rich heritage visible in the monumental structures built during the Mughal rule.

16. India's Foreign Policy (1947-2000)-AHIS602

CLO 1Understand the historical evolution and various trends in India's Foreign Policy and develop a critical viewpoint on India's foreign policy realities in South Asia and at the global level

CLO 2Analyse the initiatives undertaken in India's Foreign Policy, various leadership and diplomatic endeavours

CLO 3. India's trade relations and the role of media and soft power in leveraging the international presence of India.

CLO 4. Apply the knowledge on foreign policy for research projects at think tanks and build research interests in students on the current challenges

CLO 5 Create and bring solutions to current challenges

17. Introduction to Museology and Archival Science-AHIS603

CLO 1. Trace the different stages in the proliferation of museum movement in India and its role in disseminating information of the past and the present.
CLO 2. Suggest measures to be adopted by a curator to motivate the Student community to consider career opportunities at the museum.
CLO 3. Make a comparative study of the different types of Museums in India.
CLO 4. Enumerate the different methods adopted by museums for acquisition of artefacts.
CLO 5. Review the factors that lead to decay of museum objects and the measures taken to preserve it.
CLO 6. Draw a plan to enhance the In -house and Out-reach activities of the museums to enlighten the visitors.
CLO 7. Make a Plan for mass education through the museum exhibitions.
CLO 8. Discuss the International parameters involved in Classification of Archival Records.
CLO 9. Understand and appreciate the relevance of systematic preservation and management of archival sources.
CLO 10. Apply the recent trends in digitalisation of Archival records.
CLO 11. Suggest measures to overcome challenges and issues confronting digital archives.
CLO 12. Design the Brochure of any Museum of their choice.

18. History of the Marathas (1707 –1818)-AHIS604

CLO 1. Write a critique on Chhatrapati Shahu Maharaj as a warrior,

diplomat and a statesman.

CLO 2. Elucidate on the Peshwa leadership that led to the expansion and consolidation of Maratha power in the 18th century.

CLO 3. Make a survey of the implications of the Maharashtra Dharma in the Northern politics.

CLO 4. Appraise the revival of Maratha power post Panipat battle and its relations with the European powers.

CLO 5. Expound on the administrative changes initiated by the Peshwa regime.

CLO 6. Make a study of the trends in the art and architecture of the Marathas under the Peshwa regime.

CLO 7. Write a discourse on the role of prominent women in the Maratha politics during the Peshwa regime.

CLO 8. Explore how the caste system was instrumental in the eventual defeat of the Peshwa in 1818.

19. History of Asia (1945– 2000)-AHIS605

CLO 1. Develop a critical understanding on the current geopolitics in Asia and explain the rise of economies in Asia- developments in Post War Japan, the emergence of ASEAN, Tiger economies and on the Oil Politics and political developments in West Asia, in the context of Western penetration in the region

CLO 2. Analyse the developments in China under Mao Zedong ideologically, and the subsequent leadership by Deng Xiaoping, in the economic transformation of China.

CLO 3.Apply analytical skills and critical thinking skills on the contemporary politics in Asia.

20. Research Methodology and Approaches to History II-AHIS606

CLO 1. Apply knowledge in conducting research by the method of hypothesis
CLO 2. Know and explain the categories of sources and methods of collection of data
CLO 3. Understand research ethics and any breach by plagiarism
CLO 4. Apply and analyse the data processing and representation of data
CLO 5. Apply the knowledge about citations and bibliography
CLO 6. Apply the knowledge of post structural, post-colonial and sub altern methods of analysis to text reading

PSYCHOLOGY

Program learning outcomes or program specific outcome

1. Review and analyse psychological concepts at individual level and societal level
2. Compare and contrast functional and dysfunctional organisation behavio

3. Students can select an effective psychological instrument _ (Intelligence ,personality, interests, aptitude and attitude)
4. Describe and evaluate the DSM classification, causal factors , treatments for psychological disorders
5. Design an experiment in the area of cognitive processes and review literature in the field of psychology as well as write a report based on replicated experiments and research papers in the APA forma
6. Explain, critically elaborate and apply human resource methods
7. Discuss and critique theories & measurements of organisational behaviour and carry out research in the areas of leadership, job satisfaction, organisational structure and motivation
8. Understand personal qualities , professional qualities and skills of a professionals in psychology through self examination and interaction with role models , as also through internships
9. Undertake projects and community based assignments and present them in a group
10. Demonstrate the application of life skills both intrapersonal and interpersonal levels
11. Arrive at an understanding & appreciation of growth, change at the physical, cognitive, social level and also personality development- during the lifespan of the individual.
12. Apply the Psychological theories to problems and issues.
13. Get sensitized to the importance of appreciating human diversity
14. An in depth understanding of the cognitive processes
15. Awareness of latest trends and research in biological aspects of psychology

POLITICAL SCIENCE

Program Learning Outcomes:

A Political Science graduate will be able to:

1. Gain disciplinary knowledge of Political Science.
2. Critically analyze the fundamental concepts, theories, perspectives, and ideological discourses in Political Science.
3. Communicate effectively about the political issues in both verbal and written forms.
4. Exhibit the skill in analyzing research problems in the field of Political Science.
5. Play a constructive role as a responsible citizen of the country.
6. Function individually and in teamwork through various group activities.
7. Apply both theoretical and practical knowledge acquired during the course to address local, national, and transnational challenges.
8. Acquire digital literacy to meet professional challenges in the domain of politics and related fields.
9. Develop scientific reasoning abilities to interpret and evaluate political ideas and issues.
10. Promote leadership skills to work effectively and solve complex political issues and challenges.
11. Practice the use of lifelong learning of Political Science.
12. Understand the nature and developments in national politics.
13. Examine the nature & development of International Politics.

14. Develop critical and creative thinking skills that are vital for identifying, defining, analyzing, and solving political problems.
15. Equip himself/herself for competitive examinations and employment in the public and private sectors.

SEMESTER I
The Constitution of India

Course Learning Outcomes:

After successfully completing this course, the students will be able to:

1. Describe the brief history in the making of the Constitution.
2. Understand the philosophy of the Preamble and enumerate the salient features of the Constitution.
3. Critically assess the concepts and provisions pertaining to Citizenship, Fundamental Rights, Directive Principles of State Policy, Judicial Review, and Judicial activism.
4. Examine the powers, functions, and limitations of the legislative, executive, and judicial branches of the government.
5. Analyze the federal system, the Centre-State relationship, and the importance of decentralization of power and evaluate the functioning of the local self-government.
6. Learn the presentation skills and work as a team through group assignments and presentations, etc.

SEMESTER II
The Indian Political Process

Course Learning Outcomes:

After successfully completing this course, the students will be able to:

1. Differentiate between national and regional political parties.
2. Explain the ideology, structure, and programs of all the national and few regional political parties.
3. Understand the concept of coalition politics and related issues.
4. Analyse the changing patterns of the Indian Party system.
5. Describe the electoral process, understand electoral reforms, enumerate different types of representations, and critically analyze the functioning of the Election Commission of India.
6. Assess the political economy of India from the Nehruvian model to date.
7. Differentiate between the Planning Commission and Niti Aayog and understand their role.
8. Analyse how issues pertaining to caste, religion, and gender influence identity politics in India.
9. Understand the role of media and what is fake news.
10. Examine the challenges facing the Indian political system, especially naxalism, terrorism, and criminalization of politics.
11. Work as a team.

SEMESTER III
Introduction to Politics

Course Learning Outcomes:

After successfully completing this course, the students will be able to:

1. Explain the meaning of politics.
2. Distinguish between the traditional and modern views of politics.
3. Analyse the approaches to politics.
4. Enumerate the basic elements of the state, assess the theories and perspectives of state, distinguish between state, government, association, and society.
5. Describe the changing perspectives of the nation-state system.
6. Explain and distinguish the concepts of power, authority, and legitimacy.
7. Elucidate the concept of law and sources of law.
8. Expound the concept of political obligation, grounds of political obligation, and different perspectives on right to resist.
9. Work as a team.

SEMESTER III
Public Administration

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Explain the different stages in the evolution of Public Administration.
2. Distinguish between public and private administration.
3. Discuss the differences between Traditional Public Administration, New Public Administration, New Public Management. When and how they emerged?
4. Examine the principles and theories of organization.
5. Explain the concepts and theories on motivation and leadership. How can people in an organization be motivated towards their work and what kind of leadership skills are required in an organization?
6. Critically analyze the Bureaucratic, Scientific Management, and Human Relations theory.
7. Evaluate the concepts of E-Governance, Good-Governance, and Public-private partnership.

SEMESTER IV
Political Concepts & Ideologies

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Explain the concept of rights, distinguish between negative and positive rights, describe the evolution of rights and classification of rights, and evaluate various theories of rights.
2. Examine the concept of liberty, distinguish between negative and positive liberty, describe types of liberty and safeguards of liberty.
3. Discuss the development of the concept of equality, dimensions of equality, and the differences between liberty and equality.
4. Assess diverse perspectives on justice, dimensions of justice, and the concept of procedural and distributive justice.
5. Explain the concept of democracy, evaluate the theories of democracy, its merits, and demerits.
6. Reflect on conditions for the successful working of democracy and challenges to democracy.
7. Critically assess nationalism, socialism, and feminism.
8. Work in collaboration with others.

SEMESTER IV:
Indian Administration

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Explain how the Indian administration is a legacy of British rule?
2. Describe the Constitutional context of Indian administration and its basic features.
3. Draw the structure of the Indian administration from the center to the local level.
4. Explain the meaning of personnel administration and its evolution.
5. Examine how the civil servants are recruited and what kind of training is given to them?
6. Critically assess UPSC, its powers, and its functions.
7. Explain the meaning of budget, how it is prepared and kept accountable?
8. Understand the importance of financial parliamentary committees and their functions.
9. Reflect on the challenges to the Indian administration and the remedies.

SEMESTER V:
Introduction to Public Policy

Course Learning Outcomes:

After successfully completing this course, the students will be able to:

1. Explain the meaning, nature, and significance of public policy.
2. Examine the contextual- setting of public policy.
3. Describe the public policymaking process.
4. Critically assess the different theoretical approaches to public policy.
5. Assess the process of policy implementation.
6. Evaluate a public policy?

7. Analyze the key policy initiatives in India.

SEMESTER V:
Western Political Thought

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Examine why Machiavelli gave so much importance to pragmatism in statecraft.
2. Describe the advice given to the ruler by Machiavelli in his celebrated book *The Prince.*
3. Evaluate Machiavelli's contributions to political thought.
4. Critically discuss the Social Contract theory of John Locke.
5. Analyze critically the contributions of John Locke to political thought.
6. Assess the views of J.S.Mill on liberty and utilitarianism.
7. Evaluate J.S.Mill's contributions to political thought.
8. Appraise John Rawls views on Justice and his contributions to political thought.
9. Critically assess Marxism.
10. Evaluate the thoughts of Antonio Gramsci as a neo-Marxist.
11. Analyze the views of Simone de Beauvoir as a feminist.
12. Understand the concept of multiculturalism and the views of Will Kimlicka on it.

SEMESTER V:
World Politics

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Differentiate between World Politics, International Relations, and International Politics.
2. Explain the scope and relevance of International Relations.
3. Assess Liberal and Realist approach to International Relations.
4. Understand the concept of power, national interest, and balance of power
5. Analyse the concept of multipolarity, bipolarity, unipolarity, and non-polarity.
6. Enumerate types of conflict and the changing nature of conflict.
7. Critically discuss different approaches to peace.
8. Understand the concept of national security and human security.
9. Describe and analyze the role of IMF, World Bank, and WTO.
10. Assess the structure, powers, and functions of the European Union.
11. Analyse the concept and different dimensions of globalization.
12. Learn presentation skills and collaborative skills.

SEMESTER VI:
Politics of Modern Maharashtra

Course Learning Outcomes:

After successfully completing this course, the students will be able to:

1. Describe the historical background of the State.
2. Analyse the movement for a separate State of Maharashtra.
3. Critically assess sub-regionalism and political and administrative measures to resolve the same.
4. Highlight the interaction between caste and politics in Maharashtra.
5. Assess the Dalit and OBC politics and its implications in context to Maharashtra.
6. Analyze the genesis, structural and functional aspects of urban and rural pressure groups of Maharashtra.
7. Review the emergence, significance and, functioning of the regional political parties of Maharashtra.
8. Comment on some of the contemporary social movements of Maharashtra.

SEMESTER VI:
Indian Political Thought

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Explain the key ideas of Ranade.
2. Examine the Gandhian thought.
3. Distinguish between the nationalism of Tagore and Savarkar.
4. Evaluate the ideas of Savarkar on Hindutva.
5. Assess the rational views of Agarkar.
6. Critically examine the key ideas of Ambedkar.
7. Examine the socialistic ideas of Nehru and Lohia.

SEMESTER VI:
India in World Politics

Course Learning Outcomes:
After successfully completing this course, the students will be able to:

1. Critically analyze the determinants, principles, and objectives of India's foreign policy.
2. How and why under to what extent India's foreign policy has changed?
3. Explain the meaning, types, and changing nature of diplomacy.
4. Assess India's relations with the USA, Russia, and China.
5. Comment on India's relations with Pakistan and Bangladesh.
6. Analyse India's interactions with SAARC.
7. Explain the Look East Policy and Act East Policy.
8. Describe India's role in the United Nations.
9. Learn to work as a team.

PHILOSOPHY

Program Outcomes or PO

1: Apply moral reasoning to contemporary ethical issues and moral problems.

2: Reflect on and evaluate their own ethical decisions, actions and practices, as well as on their obligations as morally responsible agents.

3: Identify and analyze the major currents of thought in philosophy.

4: Apply philosophical perspectives to contemporary issues.

5: Analyze, synthesize and evaluate ideas and apply analytical skills to solve problems.

6: Develop conceptual competence, demonstrate vigor of logical inquiry, and produce clarity of expression.

7: Learn to read, analyze and reflect on primary philosophical texts to formulate their own understanding.

8: Recognize and respect the beliefs, opinions and values of other individuals and cultures.

9: Demonstrate an awareness of personal, social, civic, and environmental responsibility.

Course Outcomes or CO

Moral Philosophy (APHI101 Semester I and APHI102 Semester II)

1: Analyze the major moral philosophical schools of thought like Virtue Ethics, Deontological, and Utilitarianism and philosophers like Kant, Mill and Bentham.

2: Apply philosophical knowledge to real-world problems and contemporary issues.

3: Proficiency in critical thinking, including the ability to ask relevant questions, examine different sides of an issue, and recognize and evaluate arguments.

4: Seek general explanatory principles, reflect upon what really matters, look for alternatives to widely-accepted views, and learn to distinguish what is significant from what is not.

5: A taste for philosophical discussion and an examined life, including critical receptivity toward alternate viewpoints and arguments

Social and Political Philosophy (APHI201 Semester III and APHI202 Semester IV)

1: Primary concepts of social and political philosophy like society, community, family, gender, discriminations of caste and class.

2: Students become familiar with theories regarding relation and responsibilities between individual and society, transitions of social change and progress.

3: An ability to identify and reconstruct political arguments, including the ability to identify premises and conclusions in political arguments.
4: Acquainted with theories and Philosophers associated with political ideologies.
5: Increases students' horizons to analyze philosophical debates around political themes. or write short expositional and critical essays in social and political thought.

Philosophy of Religion (APHI301 Semester III and APHI302 Semester IV)

1: Get acquainted with arguments for the existence and non-existence of God and the peculiarity of religious language.
2: Besides discussion about ancient religious beliefs, the course does not confine itself to these only but expands other new age humanistic religions within its purview and it also throws light upon the recent concepts of Universal Religion, interreligious understanding and communications.
3: Compare and contrast Eastern and Western approaches to religion and religious experience.
4: Critically evaluate concepts of God, creation, miracles, faith, mysticism, life after death, etc.
5: Examine the relationship between science and religion and evaluate the various challenges to religion.

Classical Indian Philosophy (APHI401 Semester V and APHI402 Semester VI)

1: Knowledge about the definition, division, features of the Philosophy of Orthodox school and Heterodox Schools of Indian Philosophy.
2: Familiarize with the Epistemology, Metaphysics, Ethics and Logic of Classical Indian Schools of Thought.
3: Understand the role of interpretation of texts in deciding the position and key concepts, theories, and arguments of classical Indian philosophers and schools of thought.
4: Students write good philosophical essays which reveal improved skill in the presentation and defence of arguments.
5: Description of the very idea of cause-effect relationship and methodology of interpretation of texts.

Greek Philosophy (APHI501 Semester V)

1: Comprehend primary sources in philosophy and understand main arguments.

2: Students compare and contrast the core of a philosophical problem as stated by the Greek philosophers, the issues they raised and the questions they asked by referencing the inquiry to a system.

3: Students defend a philosophical position, view, or theory from more than one perspective.

4: Students demonstrate a basic understanding of methods of philosophy given by philosophers such as the Ionians, Sophists, Socrates, Plato and Aristotle.

5: Students identify/recognize consistencies and inconsistencies of specific philosophical theories or worldviews.

Western Philosophy (APHI502 Semester VI)

1: Learn about western sources in philosophy and understand presented by them in the form of arguments and debates.

2: Compare and contrast the core of a philosophical problem, issue, or question by referencing the inquiry to system proposed by Rationalists, Empiricists, Idealists and modern
Western thinkers.

3: Students critically evaluate and defend philosophical positions, perspectives and theories from more than one view point.

4. Students develop and defend student's own unique philosophical point of view.

5: Students demonstrate a basic understanding of methods of philosophy and identify and recognize consistencies and inconsistencies of specific philosophical theories or worldviews.

Applied Ethics (APHI 601 Semester V and APHI602 Semester VI)

1: Compare and contrast at least two different aspects of issues examined in bioethics, environmental issues, sexual ethics, professional ethics, etc. with respect to ethical perspectives and learning to identify the pros and cons of each proposed position.

2: Critically discuss, defend positions in a debate about issues under applied ethics and subject them to critical analysis as well as produce possible resolutions.

3: Think critically about ontological, epistemological, methodological, ethical, or religious questions that arise in applied ethics.

4: Compare and contrast philosophy of science and technology.

5: Discuss ethical, political, social and cultural issues relevant to applied ethics.

ACCOUNTS

Program Outcomes:

1. **Students will be able to prepare books of accounts as per different accounting methods.**
2. **Students will be able to analyse the books of accounts of commercial organisations.**
3. **Students will be able to detect errors and frauds in books of accounts.**
4. **Students will be able to describe and follow the ethics in preparation of books of accounts at their workplace and in their own ventures.**
5. **Students will be able to compartmentalize incomes under different heads of income under Income Tax.**
6. **Students will be able to discuss the fall and rise of markets, economic conditions in research meets at the global level.**
7. **Students will be able to serve the society in a better manner.**
8. **Students will be able to select and utilize appropriate accounting term with which to analyze Accounting problems in a wide variety of areas.**
9. **Students will be able to make rigorous accounting and ethical arguments.**
10. **Students will be able to express themselves orally in an articulate, sound and well-organized fashion.**

Course Outcomes:

FY students will be able to do Accounts for their personal use and can be helpful to their relatives and friends for preparing their books of Accounts.

SY students will be able to prepare Accounts for Partnership firms as well as they will be able to

read and understand few schedules of Annual reports of the Company and audit cash transactions, check the vouchers and verify them.

TY students have various subjects:

In Financial Accounts students will be able to read and understand the Annual reports of the Company.

In Cost Accountancy students will be able to understand different types of Costing techniques and apply them.

In Direct Tax the students will be able to understand their personal taxation structure and when and why the taxes are to be paid.

In GST the students will be able to file GST returns for the Small traders and retailers.

In financial management the students will be able to understand the preparation of Budgets, reading and understanding the various financial statements to be prepared by the company.

EVS

The Program/Course Learning Outcomes

a. After the completion of program/course on environmental studies, learner is able:

1. To describe the basic concepts of environment.
2. To analyse the functioning of ecosystem.
3. To demonstrate the coherent and systematic knowledge in the discipline of environment.
4. To evaluate the role of human beings behind environmental issues.
5. To assess the status the stock of natural resources in the world and environmental issues related to thereof with solutions.
6. To deal with solutions for current environmental issues.
7. To evaluate the process of urbanisation with respect to population growth, migration and concurrent developmental issues.
8. To carry out field work
9. To handle the instrument for collection of primary data
10. To state the sustainable ways of living
11. To display an ability to read maps with environmental significance.
12. To learn map filling skill and to look at the various aspects on the space.
13. To cultivate ability to evaluate critically the wider chain of network of environmental aspects from global to local level on various time scales as well.
14. To recognize the skill development in Environmental studies course as part of career avenues in various fields like teaching, research, and administration.

15. To demonstrate the knowledge obtained in such way so that they can find the solutions for environmental problems and serve to the society

COMMERCE

- Programme Outcomes
- Apply the strategies ,plan and techniques of marketing/exports to improve productivity and profits of any organisation.
- 2.Practice the management principles and theories in their workplace.
- 3.function as an effective Leader by working in multidisciplinary teams and diverse settings.
- 4.Apply the business acumen gained in practice by having their own start ups.
- 5.Exhibit and practice the applicability of ethicsin all functional areas of business and technology
- Course Outcomes:
- 1.Indepth understanding of financial concepts and their application.
- 2 Focused approach to using financial methodologies for business decisions.
- 3.Logical and situation based idea of handling the financial challenges
- 4.Ensuring a flexible but progressive approach in financial plans of the business
- 5.Receptive and comprehensive approach to identify the financial changes.

BAF

PROGRAM LEARNING OBJECTIVES

1. Apply the accounting treatments to record transactions for a Proprietorship, Partnerships and Companies with respect to Financial Accounting. Using techniques of Cost Accounting to reduce expenses and manage cost sheets pertaining to different departments in an organization. An added skill would be to interpret and analyse financial statements and garner knowledge about Management Accounting.

2. Documenting the accounting transactions of companies at the time of raising capital in the form of shares and debentures and redemption of debt as well as maintain the books of accounts at the time of reconstruction. The students will also be able to prepare the financial statements of Banks, Insurance companies and NBFCs as per the rules and regulations laid by the concerning authorities.

3. Gain expertise in choosing the best source of raising funds and the allocating the resources optimally with an objective to earn maximum returns. Demonstrating skills to the determine the value of bonds and calculate the best dividend policy by analysing current market standing of the organization.

4. Complete understanding of Primary and Secondary Markets in India. The students will be able to explain the various instruments and securities of different tenures traded in the Money Market and Capital Market. Moreover, the students will have achieved an exposure to traditional and contemporary investment arenas.

5. Demonstrate knowledge and understanding of various investment options available in the Equity Market, Commodities Market, Derivatives market, etc., state the benefits of having a diverse portfolio while minimizing risks and maximizing returns. Using Fundamental Analysis and Technical Analyse to monitor the markets and take informed decisions.

6. Thorough conversance of the Indian taxation system as well as an awareness of International Tax regulations. Complete understanding of the Goods and Service Tax and its implications while carrying out a business. They will be equipped with the knowledge of Income Tax which can be applied practically. Furthermore, the students will have access to pertinent information on International Taxation.

7. Demonstrate risk management skills that will enable firms to prepare for the unexpected by reducing risks and additional expenses before they occur rather aim for profits. In addition to that, the students will be able to detect potential threats and weaknesses of organizations and craft strategies to get an added advantage in the competitive environment.

8. Discover interests and explore arenas in the industry the students will be given a chance to pursue an elective too.

    a. Marketing Management in the Digital Era: Use major tools and techniques to confidently implement numerous marketing strategies across various traditional and digital platforms.

BFM

PROGRAM LEARNING OBJECTIVES

1: Students will be equipped with a thorough understanding of specialized subjects like Primary Markets, Organisational Behaviour, Secondary Markets, Business Ethics and Management, Entrepreneurship, Corporate and Financial Accounting.

2: The students will gain an insightful experience which will cover the curriculum of professional courses such as the Chartered Financial Analyst (CFA) and Enterprise Risk Management (ERM), which cater to the core activities in the financial markets.

3: Ability to grasp the characteristics, role, orchestration and development of the money, debt, bond, commodity markets and the mutual fund industry pertaining to the same. Determine fair valuations of these securities to make informed investment decisions.

4: Students will be familiarised with the workings of various capital market segments, i.e equity, debt, derivatives, commodities, alternative investments etc. from a practical standpoint.

5: Students will be able to understand how Investment banks help their clients with financing, research, trading and sales, wealth management, asset management, IPOs, mergers, securitized products, hedging, and more.

6: Students will be able to employ analytical tools like ratio analysis, trend analysis, and cash flow statements based on the functioning of a business for making calculated decisions to be industry-

ready for the global accounting & financial sector through a detailed application of balance sheets, income statements, investment accounting and working capital management.

7: Students will be acclimatized to the numerous investor psychologies that have a profound impact on their financial decisions. They will also be able to examine the numerous financial models involved in behavioural finance that assist investment managers in making sound investment decisions.

8: Students will be eligible to identify the nature, scope and significance of research and research methodologies and obtain a basic understanding of the various processes involved in writing a research paper, particularly the study of primary and secondary research methods, qualitative and quantitative designs etc.

9: The students will be able to apply accounting practices, data handling, financial analysis and further be able to quantify raw data and solve business problems.

10: The student will be able to demonstrate, employ, interpret and apply research methodologies to conduct an individual investigation on current problems within a student's field of interest with the help of the various tools acquired during the term of the course.

11: Understand the concept of risk and the increasing importance of risk management for the businesses of today. Students will also be able to analyse and interpret the risks associated with a particular project with the help of numerous tools acquired during the term of the course.

12: Familiarize with the essential laws governing various sectors of the economy starting with the Indian Contract Act 1872, Special Contracts Act, Benami, NCLT, and SARFAESI Act by employing the principles and precedents of business law and auditing requirements through Vouching and Verification.

13: Through various activities like presentations, group discussions, debates; the students will benefit in terms of their soft-skills development. Students will be able to assimilate within their respective workplaces and contribute positively towards a holistic work culture. They will learn the art of public-speaking and will apply this successfully at work negotiations.

14: Students will be able to appreciate the significance of sustainable development. The course will encourage them to apply core concepts, competencies and creativity that will foster entrepreneurship into practice.

15: Apply tools like MS Excel, MS PowerPoint, MS Word, Tally, CorelDRAW, Google Analytics, HTML and MIS to automate data in an innovative manner.

16: Ability to overcome ethical dilemmas in their personal and professional lives while comprehending the significance of ethics in business and financial decisions.

BBI

PROGRAM LEARNING OBJECTIVES

1. Through a detailed application of insurance basics, students will adopt a comprehensive understanding of the types of insurance, claim settlements, insurance regulations, and

insurance frauds. A series of professional research projects will ensure that the students are industry-ready for the global insurance sector.

2. Students will be able to apply their understanding and expertise in various matters relating to operations of commercial banking, rural banks, Reserve bank of India, investment banking, and banking laws & practice in India. Moreover, they will understand how to build customer relationships in the banking sector and the modern banking services e.g., E-banking and internet banking.

3. The students will gain extensive knowledge in all branches of accounting such as financial accounting, management accounting, and corporate accounting. It will enable them to interpret and apply their learnings appropriately in real-life cases such as analysis, infer and record accounting transactions for sole proprietorships, partnerships, and companies.

4. Ability to comprehend the workings of an economy under varied situations by studying numerous aspects of the same while also the familiarity of characteristics of advanced economic concepts. Students will also have a better understanding of numerous financial calculations such as annuities, return on investment, variances, regression, and probability. It improves their analytical and decision-making abilities, enabling them to make more conscious decisions.

5. Students will be able to comprehend and apply knowledge of human communication and language processes as they occur across various contexts. Learners will develop the foundations, processes, and practices of writing and speaking. Apart from this, the curriculum inculcates a sense of civic responsibility, social commitment, and moral accountability among the students through social activities with exposure to human rights, value system, culture, heritage, scientific temper, and environment.

6. Students will have the opportunity to take an elective that will help them discover interests and explore industry areas.
    a. Functioning knowledge of human resources helps to outline the roles and functions of members of the human resources department, as well as educating others outside human resources, in how their roles include human resources-related activities. The students learn about the evolution in human resources management as we know it today.
    b. A thorough understanding of the Indian taxation system, as well as international tax legislation, is required. Complete knowledge of the Goods and Services Tax (GST) and its ramifications when conducting business. They will be well-versed in income tax, which they will be able to apply in the real world. Students will also have access to important information on international taxation.
    c. Employ significant tools and techniques to confidently implement a variety of marketing campaigns across traditional and digital media.

7. Students will be making use of their knowledge indulging in intensive intricate and pertinent research, ultimately drafting a concise yet descriptive research paper. Spontaneity

and of the top thinking will be put to the test while they execute their utter grit and determination to come up with creative solutions for various projects and their consequent problems.

8. Students will be able to demonstrate a complete understanding of the corporate laws starting with the Indian contract Act, 1872, Benami law, income tax, SARFAESI act, special contracts act, and be competent enough to enter a profession in which legal knowledge is an advantage. They will inculcate the skills of handling key managerial aspects. In addition to this, a thorough understanding of the primary areas of auditing while adhering to the ICAI's norms and regulations, as well as a desire to follow ethical standards will be inculcated.

9. The students will have a well-established base of all concepts related to the financial markets and be competent to analyse and interpret information about the correlated subjects.

10. The students will be well equipped with the necessary computer skills required by the industry and will have the first-hand experience on how to cope with the continuous advancements in technology. They will be able to operate software like Tally, Corel Draw, and Excel.

11. Create and maintain an internet business by creating a fool proof business plan and completing significant research, obtaining the capacity to properly handle all operations. It includes a practical component that includes continuing attempts to strengthen inner skills and raise excellence among students so that they confidently face the external environment.

BVoCSD

Programme Outcomes

PLO 1. Adaptability of new technologies:•Use of Modern tools, resources and software and apply possessed knowledge of fundamental subjects which will enable students to be 'Future technology ready'.

PLO 2. Logical and analytical thinking: Solve Complex scientific problems by using mathematical and statistical tools and techniques.

PLO 3. Data analysis and security awareness: Examine data sets with appropriate consideration to security and privacy

PLO 4. Research skills: •Analyze various research and scientific problems in the field of IT.•Exhibit professional ethics and norms of software development

PLO 5. Implementing computing based solution: Apply computer science theory and software development concepts to construct computing-based solutions

PLO 6. Experiential learning and business knowledge: Function individually and in teamwork through various live project assignments.

PLO 7. Organizational standards: Enable a person to acquire desired competency levels, transit to the job market and, at an opportune time, return for acquiring additional skills to further upgrade competencies, as well as, find opportunities to work not only in India but also abroad.

PLO 8. Placement and internship: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PLO 9. Communication skills:Communicate effectively with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PLO 10. Environment and sustainability: Understand the impact of the professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PLO 11: Cultural and Global Awareness: Recognize the applicability of computing and evaluate its impact on individuals, organizations, and global society.

PLO 12: Project management: Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PLO 13: Design and develop computer programs/computer -based systems in the areas related to networking and web design

PLO 14: Use writing, financial/statistical, presentation and data collecting/organization tools for academic research and communication.

PLO 15: Understand a wide variety of learning algorithms.Also to develop capabilities to design and develop formulations for computing models and identify its applications in diverse areas. Understand how to evaluate models generated from data. Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models. (Applicable to DS and AI)

Course Outcomes
Sem I:
Communication Skills

- To put in use the basic mechanics of Grammar
- To stimulate their Critical thinking by designing and developing clean and lucid writing skills
- To demonstrate his verbal and non-verbal communication ability through presentations
- To develop interview , group discussion, presentation skills
- To improve speaking, learning, and interview skills of students.
- To understand the Socio-Cultural Sensitization Soft Skills

French Language

- Student will learn grammar, words and sentence construction in French Language
- Demonstrate an elementary knowledge of French sentence structure through speaking and writing
- Translating french to english and vice versa
- Understanding the different Tourist Places and Essential Travel Information
- Understanding the board signs and Modes of transport in France
- Understanding Situational Communication in French and RolePlay

Office Automation

- They will be able to perform documentation
- They will be able perform basic accounting operations
- They will be able to prepare presentation
- They will be able to use MS Office tools for professional documentation preparation and analysis
- Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs
- Create, edit, save and print documents with list tables, header, footer, and images

Web designing and Programming

- Apply critical thinking and problem solving skills required to successfully design and implement a web site.
- Demonstrate the ability to analyze, identify and define the technology required to build and implement a web site.
- Demonstrate knowledge of artistic and design components that are used in the creation of a web site.
- Create, select, and apply various aspects of interactive websites, motion graphics, video and informational graphics with an understanding of the limitations.
- Able to acquire practical competency with emerging technologies and skills needed for becoming an effective web designer.

Logics and algorithm

- Understand a problem description, and then identify, compare, and apply appropriate algorithms to solve it.
- Evaluate different ways to implement an algorithm, and implement it as part of an

executable program.
- Formulate statements and problems in logical form
- Understand, at least at a high level, one or more established techniques for automated reasoning and the algorithms involved
- Critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution to a problem.

Software Engineering

- A general understanding of software engineering, process and software process models
- Interprets minimum requirements, types of requirements for the development of application.
- Describes various system models for business processes and understanding the existing system
- Develops and maintains efficient reliable software solutions by creating a blue print for further development
- Constructs SW engineering testing and risk strategies, and develops their appropriate applications.
- Develops critical thinking and evaluate assumptions and argument.

Object Oriented Programming with C++

- Understanding the various programming concepts of the C++ language.
- Students are introduced to these programming language elements including fundamental data types, flow control, and standard function libraries.
- Apply the concepts of Constructor, Destructor & inheritance
- Apply virtual and pure virtual function & complex programming situations
- Explains the use of file handling, exception handling so the students can practice extensively in the hands onlabs.
- Interpret the concepts of Object-Oriented Programming and data structures

Sem II

Organizational Behavior

- Demonstrate knowledge of OB theories, models and concepts presented in the course
- Demonstrate understanding of the role of individual level (micro), and group and organizational level (macro) factors in fostering organizational success
- Demonstrate the ability to analyze and evaluate organizational behaviour
- Understand how evidence-based management is used to diagnosis problems and provide solutions to organizations
- Understanding health Psychology
- Understanding cultural negotiations, global leadership & motivational issues – cultural difference in ethics & decision making

Principles of Marketing and Customer Service Management

- Understanding the origin, importance, scope and functions of marketing

- Understanding Customer Relationship Management Fundamentals
- Understanding Service Quality
- Importance of marketing mix in marketing decisions
- Understand Components of Customer Satisfaction, Customer Satisfaction Models, Rationale of Customer Satisfaction, Measuring Customer Satisfaction, Cases of Customer Satisfaction
- Understand Societal marketing concept, Impact of marketing concepts and its applicability

Introduction to computer networks

- Students can Discuss the key technological components of the Network
- Understand the capacity and use of different cables used in a network
- Enumerate the layers of the OSI model and TCP/IP and will understand the function(s) of each layer.
- Identify the different types of network topologies
- Identify the different types of network devices and their functions within a network
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation

Modern Operating Systems

- Core understanding of fundamentals
- Descriptive objectives of each aspect
- Foundation of design, concepts and structure
- Understanding computing and resource management of the computer
- organization and operating systems
- Operating system form and function
- Software structure: abstraction, modularity, interface vs. implementation, layers

Computational Mathematics

- Promote analytical and critical thinking.
- To develop inductive skills in reasoning.
- To be able to utilize technology, including computer algebra systems, to solve problems numerically, symbolically, and graphically.
- To understand the basic concepts of probability and statistics.

- To understand the principal concepts of the calculus.

Core Java

- Use the syntax and semantics of java programming language and basic concepts of OOP.
- Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
- Design event driven GUI applications which mimic the real world scenarios.
- Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
- Identify classes, objects, members of a class and relationships among them needed for a specific problem
- Implement the database connectivity and to familiarize the advanced java programming skills

Database Management System

- Students must be able to describe the fundamental elements of relational database management systems
- Students must be able to design ER-models to represent simple database application scenarios
- Students must be able to Improve the database design by normalization.
- use Structured Query Language (SQL) to define and manipulate database information.
- describe and develop Relational Algebra and Relational Calculus queries.
- Will be able to explain the principle of transaction management design.

Sem III

Basics of Network Security

- Understanding the principles underlying cryptographic concepts and technologies available today, including symmetric and asymmetric encryption, hashing, and digital signatures.
- To be able to secure a message over an insecure channel by various means.
- To understand the threats and vulnerabilities that are specific of a networked environment, and explain countermeasures including firewalls and intrusion detection systems

- To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
- To understand how malicious code functions, what the vulnerabilities that make propagation possible and what methods and practices are available for mitigation
- To understand various protocols for network security to protect against the threats in the networks.

Green Computing

- Have a greater awareness of fire and be able to select the correct firefighting equipment relative to its contents, capacity and limitations and operate it safely in the event of fire
- Evaluate workplace to determine the existence of occupational safety and health hazards
- Perform cradle to grave lifecycle analysis of the materials used in electronic devices
- Students will be aware and promote green initiatives in their environments leading to a green movement.
- Understand the environmental impacts of using paper and knowledge about the cost and efficiency benefits of reducing paper
- Relate the challenge of managing e- waste to the broader goal of developing sustainable electronics

Digital Marketing

- Will help them to understand the strategies to advertise their product
- Understand strategies of Public relations
- Understand social media marketing, search engine optimization, Freelancer affiliate Marketing, Google Adwords, Create advertising campaigns on google
- Understand market analysis and target audience analysis
- Understand Infographics Content marketing, DigitalMarketing strategy, E commerce Business Marketing

Advanced Java

- Knowledge of the structure and model of the java programming language, (knowledge)
- Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
- To learn the creation of pure Dynamic Web Application using JDBC.
- Student will be able to develop web application using Java Servlet and Java Server Pages technology
- Develop software in the java programming language, (application)
- Understand EJB for enterprise applications

Advance Web Designing & Programming

- Students will have hands-on experience on various techniques of web development and will be able to design and develop a complete website.
- Analyze and solve common Web application tasks by writing PHP programs using various PHP library functions, and that manipulate files and directories.
- Analyze and solve various database tasks using the PHP language.
- Use Bootstrap's predefined classes and Bootstrap's grid system to develop responsive navbars and style typography, tables, and forms with Bootstrap
- Use jQuery UI features and animation techniques and select DOM objects using jQuery selectors and event handlers
- Use various AngularJS features including directives, components, and services to implement a functional front-end for a web application

Data Communication and Networking

- Interpret the basics of Computer Networks and Various Protocols.
- Generalize functionalities and services of each layer of OSI and TCP/IP model.
- Explains the concept of data framing and error control mechanisms
- Compares Different routing protocols
- Understand types of addresses, data communication.
- Understanding client- server network application in form of FTP, HTTP, Email concepts.

Software Testing

- Understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
- Design and conduct a software test process for a software testing project.
- Understand the use of software testing methods and modern software testing tools for their testing projects
- Design SQA activities, SQA strategy, formal technical review report for software quality control and assurance
- Apply software testing knowledge and engineering methods

Sem IV

Financial Literacy

- Students will be able to understand the fundamentals of Book Keeping
- Evaluate the functions of accounting and rules of debit and credit. They also will be

able to make journal entries
- They will gain complete awareness about the taxation system
- Students will be able to differentiate between the direct and indirect taxes for individuals and companies
- They will be able to identify various financial services and the various types of insurances available

Research Methodology

- Understand the Research specific procedures or techniques used to identify,select,process and analyze information about a topic
- Select and define appropriate research problems and parameters
- understanding of literature reviews, data analysis, applying research concepts and report writing.
- Organize and conduct research in a more appropriate manner
- identify and discuss the concepts and procedures of sampling, data collection, analysis and reporting.
- identify and discuss the issues and concepts salient to the research process.

Human Resource Management

- Student will be able to appreciate the values of HRM and incorporate in their professional life.
- Students will learn various aspects and have a perspective on organizational behaviour
- Understanding job analysis and designing
- Understanding Current Issues and Trends in HRM
- Understanding Administrative and developmental uses of performance appraisals, Common appraisal methods & management by objective
- Understanding The hiring process, staff selection methods & job bidding Employee turnover and absenteeism, employee termination Employee training programs

Android Application Development

- Understanding the fundamentals of Android operating systems
- Design and develop user Interfaces for the Android platform
- Demonstrate their skills of using Android software development tools
- Ability to develop software with reasonable complexity on mobile platform
- Demonstrate their ability to deploy software to mobile devices
- Demonstrate their ability to debug programs running on mobile devices

C# and ASP.Net MVC

- Understand the core MVC concepts
- Create applications with strong object oriented principles
- Implementing Navigation in MVC web apps
- Learn how to create backend using LINQ and query databases using Entity Framework.
- Implement web applications using ASP.NET MVC
- Learn how client-side technologies can be used to interact with RESTful services created using ASP.NET Web API.

Computer Security

- Learn the basic concepts in computer security including software vulnerability analysis and defense, networking and wireless security, applied cryptography, as well as ethical, legal, social and economic facets of security.
- Learn the fundamental methodology for how to design and analyze security critical systems
- Identify some of the factors driving the need for Computer Security
- Identify physical points of vulnerability in simple networks
- Design and implement appropriate security technologies and policies to protect computers and digital information
- Understand security in wired and wireless networks

Advance SQL with Oracle

- Enhance the knowledge and understanding of Database analysis and design.
- Develop efficient PL/SQL programs to access Oracle databases
- Manage data retrieval with cursors and cursor variables
- Enhance performance using collection datatypes and bulk operations
- Create triggers to solve business challenges and enforce business rules
- Write and execute PL/SQL programs in SQL*Plus

Sem V
Strategic Management

- Understanding of strategy formulation
- To familiarize students to corporate strategies, functional strategies and global strategies
- To develop capabilities of the students to analyze cases and develop strategic solutions
- Understanding of strategy implementation
- Understanding of strategy monitoring
- Understanding strategy evaluation

Entrepreneurship

- Teaches students to think outside the box and nurtures unconventional talents and skills
- It creates opportunity, ensures social justice, in stills confidence and stimulates the economy
- To understand the steps and processes in the process of becoming and entrepreneur
- Understanding Role of Innovation in Business and Idea Generation
- Understanding Business Plan Preparation

Multimedia-I

- Understanding the basics of Adobe Flash
- Understanding the basics of Coreldraw and photoshop
- Understanding layout designs, digital illustration, color theory, typography, image manipulation, branding, packaging and advertising
- Understanding pre-press, the design of symbols and logos & corporate stationery and multimedia project management with sound and video editing techniques.

Cyber Forensics and Investigation

- Conduct digital investigations that conform to accepted professional standards and are based on the investigative process: identification, preservation, examination, analysis, and reporting
- Work collaboratively with clients, management, and/or law enforcement to advance digital investigations or protect the security of digital resources
- Learn the issues of Data Acquisition and Data Recovery
- Describe how to conduct an investigation using methods of memory, windows, network, cloud and mobile forensics.
- Be familiar with forensic tools and case studies
- Communicate effectively the results of a computer, network, and/or data forensic analysis verbally, in writing, and in presentations to both technical and lay audiences

Python Programming and Data Structures

- Interpret the basic principles of Python Programming.
- Design, code, review, test, debug and document own programs.
- Acquire decision making and looping concepts.
- Design and develop modular programming.
- Implement database applications in python.
- To Learn data structures – lists, stacks, queues, linked list and Tree

Big Data Analysis

- Understand the basics in R programming
- Visualize data attributes using graphical elements and other R packages
- Query data using SQL and R
- Understand the use of R for Big Data analytics
- Understand Big Data and Hadoop ecosystem
- Work with HDFS ,writing mapreduce programs and HIVE queries

Theory of Computation

- Understand the basic properties of formal languages and grammars
- Differentiate regular, context-free and recursively enumerable languages.
- Make grammars to produce strings from a specific language.
- Acquire concepts relating to the theory of computation and computational models including decidability and intractability
- Develop a view on the importance of computational theory.

Project and Viva Voce

- Describe the time needed to successfully complete a project, considering factors such as task dependencies and task lengths
- Estimate project costs by considering factors such as estimated cost
- Students will be able to develop a project scope while considering factors such as customer requirements and internal/external goals

Sem VI
Multimedia-II

- Learning Advance Corel Draw tools
- Learning photoshop at advanced level
- Understanding Animation using adobe flash
- Understanding Layers and Mask
- Understanding Masking Techniques in Flash
- Implementing painting tools

Reasoning Aptitude and Placement Orientation

- Ability to use numbers and mathematical concepts to solve mathematical problems
- Ability to analyse the data using datainterpretation
- Understand and solve analytical pronlems

- Understand SYLLOGISM
- COMPREHENSION & TECHNICAL WRITING

Data Analytics

- Understanding process of how data analytics is applied
- Understanding data analytics can be used to better address and identifyrisks
- Demonstrate the power of data analytics using casestudies
- Understand Use appropriate models of analysis, assess the quality of input, derive insight from results, and investigate potentialissues.
- Analyze and interpret data using an ethically responsibleapproach
- Obtain, clean/process and transformdata.

Artificial Intelligence

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- To enable Problem-solving through various searching techniques
- Design, implement and apply novel AI techniques based on emerging real-world requirements
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
- Explain the basic concepts in Neural Networks and applications
- Use PROLOG as an effective AI programming tool

Internet of Things with SDN

- Identify the Components that forms part of IoT Architecture
- Able to differentiate between the levels of the IoT stack and be familiar with the key technologies and protocols employed at each layer of the stack
- Familiar with Raspberry Pi Components and interface and its installation.
- Understand modern networking elements SDN and NFV
- Able to analyse the data link and network layer protocols for IoT
- Able to design some IOT based prototypes

Emerging Technology

- Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).
- Evaluate NoSQL database development tools and programming languages.
- understanding of the detailed architecture, define objects, load data, query data and

performance tune document-oriented NoSQL databases.
- unserstanding of JSON and BSON data type
- Parsing other data type to mongodb using programming languages.

Optimization Technique

- Understanding the Concept of optimization and classification of optimization problems.
- Formulate the LPP for a real life Problems and give the solution for the problem using using Graphical, Simplex and Big-M method.
- Find the feasible solution of Transportation Problem using North-west Corner Rule, Least cost Method and VAM.
- Solve the Assignment and Travelling Salesman Problem using Hungarian Algorithm
- Solve sequencing and queuing problems when working with the real world issues
- Develop an understanding of decision theory, theory of games for improving decision making skills

Project and Viva Voce

- Describe the time needed to successfully complete a project, considering factors such as task dependencies and task lengths
- Estimate project costs by considering factors such as estimated cost
- Students will be able to develop a project scope while considering factors such as customer requirements and internal/external goals
- Students will be able to develop project on Machine Learning or Artificial Intelligence

INFORMATION TECHNOLOGY

Programme Outcomes

PLO 1. Adaptability of new technologies:•Use of Modern tools, resources and software and apply possessed knowledge of fundamental subjects which will enable students to be 'Future technology ready'.

PLO 2. Logical and analytical thinking: Solve Complex scientific problems by using mathematical and statistical tools and techniques.

PLO 3. Data analysis and security awareness: Examine data sets with appropriate consideration to security and privacy

PLO 4. Research skills: •Analyze various research and scientific problems in the field of IT.•Exhibit professional ethics and norms of software development

PLO 5. Implementing computing based solution: Apply computer science theory and software development concepts to construct computing-based solutions

PLO 6. Experiential learning and business knowledge: Function individually and in teamwork through various live project assignments.

PLO 7. Organizational standards: Enable a person to acquire desired competency levels, transit to the job market and, at an opportune time, return for acquiring additional skills to further upgrade competencies, as well as, find opportunities to work not only in India but also abroad.

PLO 8. Placement and internship: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PLO 9. Communication skills:Communicate effectively with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PLO 10. Environment and sustainability: Understand the impact of the professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PLO 11: Understand the basic embedded system components and acquire necessary knowledge to construct IoT systems and use cloud services for processing and storage of the data produced by the IoT devices.

PLO 12: Project management: Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PLO 13: Design and develop computer programs/computer -based systems in the areas related to networking and web design

PLO 14: Use writing, financial/statistical, presentation and data collecting/organization tools for academic research and communication.

PLO 15: Understand a wide variety of learning algorithms. Understand how to evaluate models generated from data. Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models. (Applicable to DS, ML, AI)

Course Outcomes
Sem I:
Imperative Programming

- Interpret the basic principles of C Programming
- Acquire decision making and looping concepts.
- Explore usage of Arrays, strings, structures and files.
- Effective utilization of pointers and preprocessor directives
- To design, implement, debug and test programs using the fundamental elements of C/Python
- Design and develop modular programming.

Digital Electronics

- Interpret and manipulate representations of numbers stored in digital computers
- Convert different type of codes and number systems which are used in digital communication and computer systems
- "Explain Gates and flip flops and make use in designing different data processing circuits, registers and counters and compare the types."
- Simplify digital circuits using Karnaugh Map and Quine Mc Cluskey Technique
- "Design and analyze combinational and sequential circuits"
- Design and analyses synchronous and asynchronous sequential circuits using flip-flops

Operating System

- Core understanding of fundamentals
- Descriptive objectives of each aspect
- Foundation of design, concepts and structure
- "Understanding computing and resource management of the computer organization and operating systems"
- Operating system form and function
- Software structure: abstraction, modularity, interface vs. implementation, layers

Discrete Mathematics

- Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.
- Demonstrate the application of discrete structures in different fields of computer science.
- Solve problems using recurrence relations and generating functions
- Apply different mathematical proofs, techniques in proving theorems.
- Compare graphs, trees, and their applications.

Communication Skills

- To put in use the basic mechanics of Grammar
- To stimulate their Critical thinking by designing and developing clean and lucid writing skills
- To demonstrate verbal and non-verbal communication ability through presentations
- To improve speaking, learning, and interview skills of students.
- To develop interview , group discussion, presentation skills
- To study technology based communication

Sem II

Object Oriented Programming

- "Understanding the various programming concepts of the C++ and python language."
- "Students are introduced to these programming language elements including fundamental data types, flow control, and standard function libraries."
- Apply the concepts of Constrctor, Destructor & inheritance
- Apply virtual and pure virtual function & complex programming situations
- "Explains the use of file handling, exception handling so the students can practice extensively in the hands onlabs."
- "Interpret the concepts of Object-Oriented Programming as used in Python"

MICROPROCESSOR & MICROCONTROLLER ARCHITECTURE

- To understand the basic architecture of 16 bit and 32 bit microprocessors.
- to recall and apply a basic concept of digital fundamentals to Microprocessor based personal computer system
- to distinguish and analyze the properties of Microprocessors & Microcontrollers
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors
- analyze the data transfer information through serial & parallel ports

Web Programming

- "To design valid, well-formed, scalable, and meaningful pages using emerging technologies"
- "To develop and implement client-side and server-side scripting language programs."
- To develop and implement Database Driven Websites.
- To learn to write, test, and debug web pages using HTML and JavaScript,JQuery
- Develop skills in analyzing the usability of a web site.
- To develop the ability to logically plan and develop web pages.

Applied Mathematics

- Acquire the basic skills and conceptual understanding regarding differential, integral and multivariable calculus, as well as that of fundamental mathematical objects

- Communicate mathematical ideas orally and in writing, with precision, clarity and organization, using proper terminology and notation.
- Use knowledge of content and mathematical procedures to solve problems and make connections between the different areas of mathematics.
- Use numerical techniques in solving problems.
- Demonstrate a solid understanding of rigorous mathematical proof. Students will be able to write clear well-organized and logical mathematical arguments..

Green Computing

- Students will be aware and promote green initiatives in their environments leading to a green movement.
- Students will have knowledge about energy efficiency, ethical IT assets disposal, carbon footprint estimation
- Students can give an account of standards and certifications related to sustainable IT products,
- Students can discuss how the choice of hardware and software can facilitate a more sustainable operation
- Evaluate IT use in relation to environmental perspectives
- Students will be able to have a basic understanding of a variety of technologies applied in building a green system and to identify the various key sustainability and green IT trends

Sem3

Advanced Python Programming

- Interpret the basic principles of Python Programming.
- Design, code, review, test, debug and document own programs.
- Acquire decision making and looping concepts.
- Design and develop modular programming.
- Implement database applications in python.
- Design and develop Client Server network applications

Applied Data Structures and Algorithms

- Demonstrate and classify various data structures and their primitive operations.
- Implement the operations of linear data structures like stacks, queues and linked lists.
- Solve problem involving graphs, trees and heaps
- Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data
- Students can implement and can calculate the time and space efficiency of classic search, sort, and traversal algorithms, including the use of big-Oh notation.
- Describe the hash function and concepts of collision and its resolution methods

Computer networks

- Understand different application of networks
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP and understanding the function(s) of each layer.
- Familiarise with the Transmission Media and Flow Control
- Understand types of addresses, data communication.
- Understand how errors detected and corrected that occur in transmission

Databases and Transactions

- Understand the basic concepts and the applications of database systems.
- "able to perform the basic elements of a relational database
- management system. "
- Identify the data models for relevant problems.
- understanding transaction processing mechanisms in relational databases.
- able to describe and develop Relational Algebra and Relational Calculus queries.

Core java with JSP

- Explain the object- oriented concepts and JAVA
- Develop computer program to solve real world problems in java
- Develop simple GUI interfaces for a computer program to interact with users and to understand the event-based GUI handling principles using Applets and awt.
- Develop Multithreaded and Networking application
- Introduce Java EE Concepts with JSP

Sem IV

.NET Technologies

- Understand the core C# and .NET concepts
- Create applications with strong object oriented principles
- Implementing Navigation in web apps
- Learn how to create backend using LINQ and query databases
- Implement web applications using ASP.NET

Embedded Systems

- Acquire a basic knowledge about fundamentals of microcontrollers
- Identify building blocks of embedded systems.
- Build C programs for embedded systems to perform specific tasks.
- Demonstrate embedded development software tools for target machines.
- Design and implement microcontroller based embedded systems

- Acquire knowledge about Life cycle of embedded design and its testing.

Computer Oriented Numerical and Statistical Techniques.

- Ability to flowchart and pseudocode logic for problem solving
- Perform regression and interpolation on datasets
- Understand essential aspects of statistical sampling and analysis of experimental data
- Ability to perform estimation of parameters and hypothesis testing
- understand concepts of probability and conditional probability

Software Methodologies and Management

- Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance
- Students will be able to know various processes used in all the phases of the product.
- Understanding time management, project and resource management
- Students can apply the knowledge, techniques, and skills in the development of a software product.
- Students will be able to choose appropriate process model depending on the user requirements.
- Ability to work as an effective member or leader of software engineering teams

Advanced Network and Security

- Analyze state-of-the-art real-world enterprise-wide networks
- Design and build advanced enterprise-wide computer networks.
- Analyze Enterprise LAN, Wireless LAN, WAN technologies design
- Identify some of the factors driving the need for Computer Security
- Identify physical points of vulnerability in simple networks
- Design and implement appropriate security technologies and policies to protect computers and digital information

Sem V

Research Methodologies

- Understand the Research specific procedures or techniques used to identify,select,process and analyze information about a topic
- Select and define appropriate research problems and parameters
- understanding of literature reviews, data analysis, applying research concepts and report writing.
- Organize and conduct research in a more appropriate manner
- identify and discuss the concepts and procedures of sampling, data collection, analysis and reporting.
- identify and discuss the issues and concepts salient to the research process.

Physical Computing and IoT Programming

- Identify the Components that forms part of IoT Architecture
- Able to differentiate between the levels of the IoT stack and be familiar with the key technologies and protocols employed at each layer of the stack
- Familiar with Raspberry Pi Components and interface and its installation.
- Able to analyse the communication protocols for IoT
- Understand the role of big data, cloud computing and data analytics in a typical IoT system
- Able to design some IOT based prototypes

Mobile Application Development

- "Understanding the fundamentals of Android and iOS operating systems"
- Design and develop user Interfaces for the Android platform
- "Demonstrate their skills of using Android and iOS software development tools"
- "Ability to develop software with reasonable complexity on mobile platform"
- demonstrate their ability to deploy software to mobile devices
- demonstrate their ability to debug programs running on mobile devices

Machine Learning and Deep Learning

- formulate a machine learning problem
- Select an appropriate pattern analysis tool for analyzing data in a given feature space
- "Apply pattern recognition and machine learning techniques such as classification and feature
- selection to practical applications and detect patterns in the data."
- ability to train models, conduct experiments, and develop real-world ML-based applications and products
- able to Distinguish different types of ANN architectures
- able to Explain the deep learning concepts using Back Propagation Network

Enterprise Jakarta 8

- Apply the concept of Servlet and its life cycle to create web application.
- Apply JSP tags and its services to web application.
- Learning MVC concept by creating View Based Facelets using JSF
- Build Database connection for all types web applications.
- Develop enterprise applications using Java Beans concepts for the given problem
- with Persistence

Sem VI

Enterprise Resource Planning

- To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.
- To focus on a strong emphasis upon practice of theory in Applications.
- To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.
- To aim at preparing the students technological competitive and make them ready to self-upgrade with the higher technical skills.
- Design the ERP implementation strategies
- Understand basic use of Enterprise software, and its role in integrating business functions

Cloud computing

- Able to store, manage, process, share, collaborate data and information with high speed and accuracy.
- Understand Platform as a Service, Infrastructure as a service and Software as Service
- Understand the new ways you can use to program, develop, deploy and provide application access to the users
- Able to identify problems, and explain, analyze, and evaluate various cloud computing solutions.
- Understand the concept of Cloud Security
- Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.

Artificial Intelligence and Soft Computing

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Design, implement and apply novel AI techniques based on emerging real-world requirements
- explain the basic concepts in Neural Networks and applications
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.

Big Data and Next Generation

- List the components of Hadoop and Hadoop Eco-System

- Manage Job Execution in Hadoop Environment
- Student must be Able to understand the building blocks of Big Data
- To understand the applications using Map Reduce Concepts
- To introduce programming tools PIG & HIVE in Hadoop echo system
- To understand cassandra and mongodb

Cyber security

- Plan a vulnerability assessment and penetration test for a network.
- Execute a penetration test using standard hacking tools in an ethical manner.
- Identify legal and ethical issues related to vulnerability and penetration testing.
- The Student will be able to Compare various Cryptographic Techniques and apply various authentication Techniques
- Identify footprinting techniques and tools
- Determine the techniques and tools used in system hacking

Economics Department

B.Com LOCF

PROGRAM LEARNING OUTCOMES (PLOs)

1. Demonstrate understanding of all basic concepts in Economics.
2. Effectively use and apply economic theory, concepts and vocabulary to solve contemporary and real-world issues.
3. Critically evaluate socio-economic policies and understand their need and relevance in the current context.
4. Display the ability to understand and interpret consumer behaviour and issues of Indian economy.
5. Recognise the importance of international relations between countries and their impact on trade, Balance of Payments and Indian financial markets.
6. Examine the basic tenets of public finance and apply the knowledge in analysing the public expenditure and revenue trends in India.
7. Develop an aptitude for understanding inflation and Business cycles and observe their real life effects.
8. Develop research possibilities in macro and Public finance related topics.
9. Develop oral and written proficiency to comprehend, analyse, evaluate and synthesise economic concepts.
10. Develop analytical skills and conduct meaningful research.
11. Make effective use of ICT in research, data analysis and updating their knowledge on an ongoing basis.
12. Promote inquisitiveness and personal growth through life-long learning.
13. Get placed in a wide range of areas like teaching, banking, public policy making and even entrepreneurship.

14. Learn various soft skills such as ability to negotiate, time management and organisational ability to make them well rounded, competitive and globally accepted individuals.
15. Improve sensitivity towards community and society and display leadership skills to eradicate social ailments.

COURSE LEARNING OUTCOMES

Semester I

Course Title: Business Economics (Microeconomic Aspects)

Course Code: CECO101

CLO1. Basic Concepts: To familiarize the students with basic micro-economic principles such as trade-off, opportunity cost, demand-supply, elasticity of demand and supply, utility.

CLO2. Thinking like an Economist: Understanding the concepts which affect individual choices and decision making which will help them to think like an economist.

CLO3. Scientific approach to economics: Understanding the art of economic model-building and role of assumptions in it.

CLO4. Learning use and significance of simple statistical and mathematical tools like tables, graphs and functions for economic analysis.

CLO5. Understanding behaviour of different economic agents such as consumers, producers and governments and analyse real life situations.

Semester II

Course Title: Business Economics II

Course Code: CECO201

CLO1. Understanding concepts like type and structure of markets, pricing principles, types of costs.

CLO2. Understanding behaviour of producers and suppliers in different types of markets under different cost conditions.

CLO3. Mathematical application: Calculating various types of costs, profit and loss and understanding its meaning and significance.

CLO4. Analytical thinking: skill to analyse various pricing policies and understand its significance.

CLO5. Case study based analysis and illustrations for concepts such as market structures, dumping, pricing policy.

Semester III

Course Title: Business Economics III (Macroeconomic Aspects)

Course Code: CECO301

CLO1. Conceptual understanding: Understanding concepts related to national income, Keynesian Economics, money, prices, inflation and unemployment.
CLO2. Understand the relevance of model-building and functioning of an economy.
CLO3. Develop an aptitude for understanding trade cycles, inflation and unemployment and examine their real life effects.
CLO4. Display the ability to understand and interpret consumer behaviour and actors affecting consumption, saving and investment.
CLO5. Learn about constituents of money supply and understand why people demand money.
CLO6. Learn about fiscal and monetary policies used to control inflation in the economy.
CLO7. Practical application: Discuss case studies about hyperinflation in different countries and measures used by the Government and Central Bank to control it.

Semester IV

Course Title: Business Economics IV (Public Economics)
Course Code: CECO401
CLO1. Examine the basic tenets of public finance and apply the knowledge in analysing the public expenditure and revenue trends in India.
CLO2. Understanding role of the government in correcting market failure and discuss case studies related to effect of market failure.
CLO3. Analysing different principles of taxation, the burden of taxation and examine its real life economic impact.
CLO4. Study the principles of public expenditure, theories of growth of public expenditure, public debt and its burden.
CLO5. Understand and analyse the Government budget and various types of deficits. Students should be able to interpret the budget and discuss its consequences on the economy.
CLO6. Examine inter-governmental fiscal relations, sources of Government revenue and expenditure.
CLO7. Research skills: Develop research aptitude related to public finance.

Semester V

Course title: Business Economics V (Indian Economy)
Course Code: CECO501
CLO1. Students learn to apply their knowledge of the subject to understand real world situation.

CLO2. Students get a perspective of the performance of the Indian economy in different sectors.
CLO3. Students get knowledge of the policy framework, recent trends and issues faced by the economy.
CLO4. Critically analyse policies, frameworks and reforms implemented in the Indian Economy.
CLO5. Learn and discuss case studies about Environmental issues, development indicators and performance in SDGs.
CLO6. Develop analytical skills and conduct meaningful research.

Semester VI

Course title: Business Economics VI (International Economics)
Course Code: CECO601

CLO1. To understand trade theories and international relations. The student should be able to comprehend an overview of the external sector, trade and tariff policies, balance of payment issues and recent global happenings.
CLO2. Mathematical application. Learning how to calculate terms of trade ratios and deficits in Balance of Payment.
CLO3. Should be able to read and interpret the Balance of Payments and learn its significance.
CLO4. Should understand the working of foreign exchange markets and the role of participants and regulator in it.
CLO5. Analyse the working of international trade organisations and understand the pacts and treaties between different member nations.
CLO6. Conduct research about international relations and discuss case studies.

Graduate Attributes
BA Economics

Upon completion of this programme, a student will have the following attributes:

- **Critical Thinking**: Ability to understand and analyse all major economic phenomena in a scientific/ logical manner
- **Analytical Thinking**: Skill to analyse government policies and regulations, and demonstrate their significance
- **Subject Knowledge**: Know how an economy functions, and how decisions are made by consumers, producers, and regulators
- **Research Skills**: Capability to identify, hypothesise, and find solutions to economic problems in a logical and efficient way by using different methods of research
- **Quantitative Skills**: Ability to process and evaluate economic data based on sound mathematical and statistical principles, in order to arrive at economically meaningful conclusions

- **Soft Skills**: Good interpersonal skills, organisational and team building ability, self-confidence and leadership qualities
- **Ethical Values**: Ability to appreciate the socio-political-economic environment and sustainability issues

Programme Specific Objectives

The programme aims to:

- Train students in basic concepts of economic theory
- Equip students with the mathematical and statistical tools required for analytical purpose
- Discuss real world economic issues and problems facing the country and the world
- Enable students to understand policy responses and find policy solutions to economic problems
- Train students to collect primary data and learn sampling techniques
- Train students to use statistical and econometric methods to arrive at conclusions about the validity of economic theories
- Train students to learn the art of economic modelling.

Programme Learning Outcomes (PLOs)

A student of the programme in Economics will be able to:

16. Demonstrate understanding of all basic concepts in Economics.
17. Effectively use and apply economic theory, concepts, and vocabulary to solve contemporary and real-world issues.
18. Critically evaluate socio-economic policies and understand their need and relevance in the current context.
19. Find innovative policy solutions to socio-economic, growth and developmental issues.
20. Display the ability to understand and interpret consumer behaviour and functioning of different type of markets.
21. Develop an aptitude to gauge the economic relationship between different macro-economic variables and the causation and correlation between them.
22. Recognise the importance of international relations between countries and their impact on trade, technology, research and development, migration, and culture.
23. Develop oral and written proficiency to comprehend, analyse, evaluate, and synthesise economic concepts.
24. Develop analytical skills, formulate research questions and hypothesis, and conduct meaningful research.
25. Make effective use of ICT in research, data analysis and updating their knowledge on an ongoing basis.

26. Promote inquisitiveness and personal growth through life-long learning.
27. Get placed in a wide range of areas like teaching, banking, public policy making and even entrepreneurship.
28. Learn various soft skills such as ability to negotiate, time management and organisational ability to make them well rounded, competitive, and globally accepted individuals.
29. Improve sensitivity towards community and society and display leadership skills to eradicate social ailments.
30. Develop strategies for sustainable growth and promote a healthy environment.

Course Level Learning Outcomes

Semester I

Course Title: Basics of Microeconomics

Course Code: AECO101

CLO1. Basic Concepts: To familiarize the students with basic micro-economic principles such as trade-off, opportunity cost, demand-supply, comparative advantage

CLO2. Thinking like an Economist: Understanding the concepts which affect individual choices and decision making like opportunity cost, response to incentive, thinking at the margin and rationality which will help them to think like an economist

CLO3. Scientific approach to economics: Understanding the art of economic model-building and role of assumptions in it

CLO4. Learning use and significance of simple **statistical and mathematical tools** like tables, graphs, and functions for economic analysis

CLO5. Understanding behaviour of different economic agents such as consumers, producers and governments and analyse real life situations

CLO6. Identifying critical economic problems and finding solutions.

CLO7. Case study-based analysis and illustrations for concepts such as taxation, price ceiling and market demand-supply.

Semester II

Course Title: Basics of Macroeconomics

Course Code: AECO201

CLO1. Basic Concepts: To familiarize the students with basic macro-economic principles such as National Income, consumption, savings, investment, public economics and external economy.

CLO2. Thinking like an Economist: Understanding the concepts which affect consumers' behaviour in an economy, savings, and investments.

CLO3. Understanding the working of trade cycles and measures adopted by the Government and Central Bank during the different phases of the trade cycle.

CLO4. Recognising the role of Government in an economy and its sources of revenue and expenditure.

CLO5. Get an overview of the external sector and international trade.

CLO6. Case study-based analysis and illustrations for concepts.

Semester III

Course Title: Intermediate Microeconomic Theory

Course Code: AECO301

CLO 1. Mathematical application. Understanding graphs, calculating equilibrium price and quantity, and learning basics of derivatives.

CLO2. Understanding concepts of production, costs and revenue and mathematically deriving them.

CLO3. Understanding and distinguishing between different market structures.

CLO4. Discussing examples of various types of market structures and relating it with theory.

CLO5. Application of microeconomic theory and concepts to understand real-world situations.

Course Title: Indian Economy and Contemporary Issues - I

Course Code: AECO302

CLO 1. Get an overview of the Indian Economy and its performance in different sectors.

CLO2. Critically evaluate economic policies and understand their need and relevance in the current context.

CLO3. Analyse the trends in Indian economy and enquire about its implications.

CLO4. Find innovative policy solutions to socio-economic, growth and developmental issues.

Semester IV

Course Title: Intermediate Macroeconomic Theory

Course Code: AECO401

CLO 1. Understanding concepts of macroeconomics such as money, prices and inflation.

CLO2. To understand how income and interest rates are determined and how fiscal and monetary policies affect them.

CLO3. Discuss case studies and examples of hyperinflation in different countries and measures adopted by the countries to bring it under control.

CLO4. Apply their knowledge of macroeconomics to real world issues.

Course Title: Indian Economy: Policy and Prospects

Course Code: AECO402

CLO 1. Understand concepts such as working of financial system, Government Budget, Public finance and international trade.

CLO2. Critically evaluate policies and reforms in the financial sector.

CLO3. Read, interpret and understand the Government Budget.

CLO4. Comprehend the types of fiscal policies, its instruments and impact on the economy.

CLO5. Analyse the trends, composition and direction of India's international trade.

CLO6. Understand the working of foreign exchange market and the role of participants in the market.

Semester V

Course Code: Advanced Microeconomic Theory

Course Title: AECO501

CLO1. Understand concepts such as collusive oligopoly, factor pricing, general equilibrium, asymmetric information.

CLO2. Comprehending the interdependence of all markets and economic agents in determining equilibrium price and quantity of all commodities.

CLO3. Learning, analysing and understanding the significance of various social welfare theorems.

CLO4. Applying their knowledge of macroeconomic concepts to issues in the current context.

CLO5. Discuss real-world examples of market failure, asymmetric information and the role of the Government in it.

Course Code: Growth and Development- I

Course Title: AECO502

CLO1.Introducing different concepts and indices related to development and growth like human development index, sustainable goals.

CLO2.Learning, understanding, and analysing different growth and development theories and models.

CLO3.Understanding socio-economic issues and problems in rural development; financial inclusion, rural-urban divide.

CLO4.Understanding the measurements of poverty and income inequality, discussing ways to reduce poverty, and analysing the problems through case study basis.

CLO5. Reviewing and discussing the government policies based on inclusive growth, rural development.

Course Code: Indian Financial System - I

Course Title: AECO503

CLO1.Introduction to structure and components of the financial system in India

CLO2.Understanding the role of the financial markets and institutions.

CLO3.Reviewing and discussing financial sector reforms in India

CLO4 Discussing the objectives and recent developments of the monetary policy of RBI

CLO5. Understanding commercial banking and non-banking financial institutes. Learning the concepts related to recent financial instruments like Bonds, Equities.

Course Code: Elementary Mathematics for Economic Analysis

Course Title: AECO504

CLO1. Understanding the concept of derivatives with respect to economic applications

CLO2. Using integration for economic applications

CLO3. Learning concepts of Linear algebra as used in Economics

CLO4. Solving Optimisation problems – constrained and unconstrained

CLO5. Building a strong quantitative base for understanding economic phenomena

Course Code: Fundamentals of International Economics

Course Title: AECO505

CLO1. Grasping different theories of international trade.

CLO2. Learning about different trade policies and evaluating them.

CLO3. Discuss examples of application of trade theories and its relevance.

CLO4. Gain knowledge about international movement of factors of production.

CLO5. Apply their knowledge about International Economics and determining factors that affect trade mobility, issues in outsourcing, Trade, and labour issues among others.

Course Code: Elementary Statistics for Economic Analysis

Course Title: AECO506

CLO1 Learning different measurements of central tendencies and variations like mean, standard deviation

CLO2.Understanding the ways to calculate correlation coefficient to analyse relation between economic variables.

CLO3.Forming regression equation and understanding the application in economic analysis

CLO4.Learning different indices and components of time series for estimation and forecasting of economic variables.

CLO5. Learning and solving problems based on probability distribution for improving quantitative base.

Semester VI

Course Code: Advanced Macroeconomic Theory

Course Title: AECO601

CLO1. Learning concepts such as Aggregate Demand and Aggregate supply.

CLO2. Recognise the trade-off between inflation and unemployment and its economic impact.

CLO3. Understanding international trade theories, terms of trade and offer curves.

CLO4. Determining exchange rate and learning about the types of exchange rates.

CLO5. Learning through case studies on market failure, role of state, principles of taxation and impact of taxation.

Course Code: Growth and Development- II

Course Title: AECO602

CLO1. Understanding the important theories of population growth and analysing its impact on economic development.

CLO2. Recognizing the role of human capital in development aspects of an economy.

CLO3. Examining the nature of migration and urbanisation in developing countries and its impact on development.

CLO4. Examining the different trade strategies in context of economic development.

CLO5. To understand the role of voluntary agencies in education and health as critical development agents.

Course Code: Indian Financial System - II

Course Title: AECO603

CLO1. To understand important instruments and participants in the Indian Money market.

CLO2. To examine the role of and reforms in the Indian Capital market since Liberalisation of the Indian economy.

CLO3. To acquaint the students with Indian derivatives market and give an introductory knowledge of Futures, forwards, and Options.

CLO4. To explain the role and nature of new financial services and its impact on the economy.

CLO5. To Discuss the changing role of the regulatory bodies in the Indian financial sector.

Course Code: introduction to Econometrics I

Course Title: AECO604

CLO1. Introducing concepts of random variables – discrete and continuous

CLO2. Using the probability distribution to understand economic experiments

CLO3. Estimating point and interval estimators for economic parameters

CLO4. Understanding hypothesis testing and how to formulate simple and composite hypothesis

CLO5. Learning the concept of forecasting and simple forecasting models

Course Code: International Economic Theory and policy

Course Title: AECO605

CLO1. Read, understand, and interpret the structure of Balance of payments.

CLO2. Understand the determination of foreign exchange rate and some exchange rate theories.

CLO3. Discuss the rationale, objectives, and types of trade blocs with examples.

CLO4. Learn about case studies of cartels and trade blocs.

CLO5. Understand and evaluate the functioning of International Economic Organisations.

Course Code: Introduction to Econometrics II

Course Title: AECO606

CLO1.To frame a population and sample regression function with respect to different economic variables.

CLO2.Understanding in detail the assumptions to frame the regression model and learn about estimators of the model

CLO3.Learning the structure of econometric model specification and understanding different types of biases and errors which can be detected in the model

CLO4. Understanding the types of problems in the regression model like auto correlation, heteroscedasticity

CLO5. Learn tests to detect the problems in the regression model