PROGRAM OUTCOME

B.A. Pass Course

The program outcomes of a B.A. pass course may vary depending on the specific curriculum and institution, but typically include:

Broad knowledge base: Graduates will have a broad understanding of various disciplines within the arts, humanities, and social sciences, including history, literature, philosophy, sociology, psychology, and economics.

Critical thinking skills: Students will develop critical thinking skills, enabling them to analyze, evaluate, and interpret complex texts, arguments, and societal issues.

Effective communication: Graduates will demonstrate proficiency in written and verbal communication, effectively expressing ideas and arguments in a clear, coherent, and persuasive manner.

Research abilities: Students will acquire basic research skills, including the ability to gather, evaluate, and synthesize information from diverse sources to support their arguments and inquiries.

Cultural awareness: Graduates will develop an appreciation for cultural diversity and global perspectives, understanding the historical, social, and cultural contexts that shape human experiences and societies.

Ethical reasoning: Students will engage in ethical reasoning and reflection, considering the moral implications of their actions and decisions within societal, cultural, and historical frameworks.

Problem-solving skills: Graduates will be equipped with problem-solving skills applicable to various contexts, allowing them to approach challenges with creativity, adaptability, and resilience.

Lifelong learning: Students will recognize the importance of lifelong learning and personal development, cultivating a curiosity and openness to new ideas, perspectives, and experiences beyond the classroom.

Career readiness: Graduates will possess transferable skills that are valued in a wide range of professions, including adaptability, teamwork, leadership, and a strong work ethic.

Civic engagement: Students will be encouraged to actively participate in civic and community activities, fostering a sense of social responsibility and contributing to the betterment of society.

<u>Course Outcomes</u> <u>Compulsory English (B.A.)</u>

After studying this English course, It will be able:

- To enable the students to acquire communication fluency.
- To enhance the linguistic competency as translation and vocabulary skills.
- To develop command on the subject through various activities and competitions.
- To acquaint the students with cultural and behavioral approaches for global competence.
- To develop intellectual, personal and professional abilities.
- To become aware of different communication skills and develop among them an ability to effectively communicate in English, both in written and spoken mode.
- Students are encouraged and enabled to read various types of texts on their own and discuss them among peers.
- Students are introduced to the grammatical concepts in order to enable them to read, write and speak English consciously.
- It strengthens student's ability in listening, reading , writing and speaking both at practical and theory level.
- It helps the students to understand the creative resources of language in Poetry, drama, Fiction, Prose and how it expresses the human emotions & experiences.
- To help them apply a critical, analytical framework to analyze cultural, historical background of texts written in English.
- It helps in developing the quality of thinking and imagination, a step towards making them realize a better human being.
- B.A. English (SEM-1) Essays- Contain inspirational Contents about various mythological and scientific concepts about origin of the universe, culture, scientific development and moral ethical learning and offer scope for effective spoken and writing skills.

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

at. E. 16-21 41621 - 4120114 at. E. हिन्दी पार्ध्यकाम से विद्यार्थी जिन्हनात्विर्ण्यत होत्रों में हमारे देश में हिन्दी माखा को 210द्रमाखा, में सराम होरों + भानक साखा एवस सम्पर्क साखा का राष्ट्र मा द्र्जा प्राप्त ١. र्श्व द्वा द्वा बर्ट्वा यह रेग की उन्द्र साधार्डेंग की जोड़ने के अव्या आसिका जिसाती है। उटालिए यह पार्ध्यम्म विद्याधियों के द्वित्रकांग को विकारित करने में जिनमेरगार्ट्यां में जिला में तथा उनमें आदम विश्वासं जागीने में सहायक है। यह पाठ्यक्रम भावी पीरिट्यों को ज्मी आहित्यिक 212212 4210 22 302 2102 11 2022 2. नाआहिम बनाने में अनम हैं। यह पाढ्यकाम विद्यादिन्द्रां में सामाजिम, सांस्ट्रांतक Var 2162721 -270-11 -11-17 + 2121272 21 3 विद्याधियों के थे। दिन विस्तास के साथ - साथ उनके 2-4-TICHAN AVIZION, CAZAN AVIZION & UBN AVIZION 4. के विकास में अथरात्र होगा । 41821 काम विद्याधियों भी नेतना शाकित के निरम्साठा एवम् काल्यालमक संस्कार युक्त दानानि 5 À 2181212 21511 1

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वी. ह. जयम वर्ध, दितीय संग्रेटट2 1. -गर्यसाहित्य के साहत्यमा से विद्याचित्यों को प्रान्तीन साहतीय संदर्भति के गांहत से पार्थन्मत करवान के साध-2 41527 - 4120114 -रेश- भाषित एवम् देश- मेम मी आवन्ता अटपन्न भाषना । 418474 में संकालित जारक के मादराम से विद्यार्थियां में विश्वीसकार हाजाउनी को जावी के आधामार्थ स्वम् 2. 321+1 291-991 22 31917 2021-11 21204 मी 4121221021 2 21121 -2 मिर्मान म 21110 काल्याया की उपयाखाओं में पार्थमात करवानी । हिन्दी आहित्य के दवर्णायुग के दवर्णायुगील कार्वयों के 3 21112021 =1 412-421 22210-11 1 हारिम दिन्दी के प्रति विद्याप्रियों में काम जागत 4 5 4164 + H & TAILIEZ UIZOINA d-2-11 1 Pazzelizzi di mizale zazzeni van zizzen zi 24061124 FERZI 2121 ENIZI à 1 FEZZI CULAZOI 49 ۱. otts +12 229+TI 1 Fazzellerzeti al adal kan diari zitarel anizia 2 मी योगराता में दृष्टि होना । वियमाध्ययां की दर्शन स्वम् आख्याटम के बारे में 3. 1 Atis Permann 4

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12-21 311-1912 A.E. BATZI all, add , ada zitizz 412217 H 4120114 -1. उत्ताद्यांत्वे हिन्दी साट्याया के विक्रिन्त कवियों की कविताओं से हमारे देश की सामाजिन - सांस्टांतर पुण्ठमाम मे 1 3 5th and 23 विद्याधियों की साहित्यक संस्कार्य प्राप्त होरों। 2 विद्याधियों के लिए शब्दीय न्येतना का आयर्ट सिंह होगा 3 Alexination your in an our in 2005 121 and in and in 2005 रीविवह, रीविस्तिह स्वम् रीविमनेत कादयब्यायं के कवियां 4. In these 2's within the this מהדוה בואת אי ארגעני או שורעני או שניבוווותו, בובתוראא the second 24204 KAH HEZA AT MINHIE ZAN 1 ite-2) any is in real sunday tak unicitie à तीत्र भी अपरेगामित के बारे में किस्पार्थियों में साम 6. 421 +2-11 +124 3 24 1012102 41201174 1 familiai mi more à acâi (mia, neuri, già, Mal) at monthal Ster Elin 1 ۱. मारायुटर भी भरूर को साल - विसाल , हिला एवम् ्यक्साय के होते के जाए आयाम स्थापित होते । 2. Rela Buck Bernenne Pre Stresse

12-21 311-10124 वी. ह. छितीय तम , यहताम २१४/२२२ 4162774 4120114 4 सहारान्द्रां में साड्यम के सामार्जिय, राजनीतिय आद आर्थिम साइयम के साथ - साथ सांदरी तादी दर्शन दो ١. USITINA anzalati 1 भारामात मारणाणा ' काहानीकार्यां की काल्यात संवेदनार उत्तीर रिप्रामान में समझले में समय वनाला ! 2. महानियों के आव्याम यो आव्यमयी आव्यीय संदर्शन til 3107 47201124 32(1620) à 2014 À AZUN2/241 à 3 अख्यानिक काल में जादा के उद्भव उत्तर विकारों के २त्ताथ-२ ग्राथ सार्विटयं की विज्यन्त विधायतं भी 4. 5. 411221116 210211001 à 3124 à 2024 à 012 H ania Et Zinte Alger H' 32121 3421111AT al Monthal 2011 +127 H PAILLEZ LEDOILA !-1. द्वाद्विक एतम् २-१जनाटमक विकास होता है। सारतीय उतिहास की जानमारी फिलती है। ग्राद्य एकम पाद्य में युद्यार्थ एकम मल्पाना करा भिन्नान होता है। जिसने विद्यादिन्यों में आव एवम् मलपूर्णा 2 21147 In विकार्य होता है। 4. आध्यानिक तमनीकी भारदावली के अन्तेमत न्याधा रिवम् विद्यालं को पाश्ट्रपार्टक स्टाम्बन्दा की पता ふでか 差」

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B.A. Economics

The students after completion of B.A. in Economics will develop understanding of the major concepts & principles in Economics. Students will be able to think critically following the economic way of thinking and will be able to analyse economic behaviour in practice. They will secure employment in various services of Economics, Statistics & Banking. Basically, economic graduates are familiar with the knowledge and application of microeconomics & macroeconomics for the formulation of policies and planning. Students will have the knowledge of financial institutions and markets and understand the structure and functions of banking.

Year wise course outcome is as under

B.A./B.Com 1st year

• Economic Problem and Demand:

- Understand the fundamental economic problem of scarcity and choice and the role of economic systems in addressing these issues.
- Analyze the circular flow of economic activities and distinguish between micro and macroeconomics.
- Comprehend the Law of Demand and the concept, types, measurement, determinants, and significance of elasticity of demand.

• Consumer Theory:

- Master the concepts of utility, including cardinal and ordinal utility analysis, to determine consumer equilibrium.
- Derive the demand curve and understand consumer surplus.
- Analyze the limitations of utility theory in explaining demand through indifference curves and budget lines.

• Producer Behavior and Supply:

- Understand the firm's role in production and apply the law of variable proportions and returns to scale.
- Use isoquants and ridge lines to determine the least cost combination of factors.
- Evaluate internal and external economies and diseconomies and measure elasticity of supply.

• Cost and Revenue Analysis:

- Grasp the concepts of short and long period costs, and apply modern cost theories.
- Understand total, average, and marginal revenues and perform break-even analysis for business decision-making.
- **Market Structures:** Understand perfect competition and monopoly, including price determination, firm and industry equilibrium, and price discrimination.
- **Imperfect Market:** Analyze monopolistic competition and oligopoly, focusing on characteristics, equilibrium, selling costs, and models like Cournot and Bertrand.
- **Market Failure:** Evaluate reasons for market failure, public goods, externalities, transaction costs, asymmetric information, and policies towards monopoly and competition.
- **Theory of Factor Pricing:** Comprehend marginal productivity theory, theories of rent, interest, and profit, including backward bending supply curve of labor and quasi-rent concepts.

2nd year

• Introduction to Macroeconomics and National Income Accounting:

• Understand the nature, scope, and key issues of macroeconomics, including GDP and National Income concepts and measurement methods.

• National Income Determination:

• Analyze the components of Aggregate Expenditure, such as Consumption and Investment Functions, and comprehend concepts like MPC, APC, MPS, APS, and the Multiplier effect.

• Open Economy National Income Determination:

- Evaluate the impact of fiscal policy, government expenditure, and taxes on Net Exports and Equilibrium GDP in an open economy.
- GDP and Price Level in Short and Long Run:
 - Study the relationships between Aggregate Demand, Aggregate Supply, and Multiplier Analysis, considering short and long-term price level changes.

• Money in a Modern Economy:

• Grasp modern monetary concepts, including the demand and supply of money, liquidity preference, and the role of monetary policy in credit creation.

• IS-LM Analysis, Trade Cycle Theory, and Growth Theory:

• Derive IS and LM functions and explore their impacts on Aggregate Demand, including theories of trade cycles and growth models.

• Balance of Payments and Exchange Rate:

• Understand the benefits of international trade, the balance of payments, and the mechanisms for determining exchange rates in foreign exchange markets.

• Public Finance:

• Analyze the principles, scope, and effects of public finance, including public expenditure, taxation, and the characteristics of a good taxation system.

3rd Year

Course Outcomes:

- 1. **Understanding Economic Development:** Grasp the features of underdeveloped countries, determinants, measurement, and obstacles to economic development, and the concept of the vicious circle of poverty.
- 2. **Growth Theories:** Study balanced and unbalanced growth theories, Lewis' model, and Leibenstein's critical minimum effort thesis.
- 3. **Environmental Economics:** Comprehend the meaning, features, and components of the environment, environmental economics, and the population-environment linkage.
- 4. **Natural Resources and Pollution:** Analyze environmental pollution, its types, causes, effects, control policies, and environmental legislation in India.
- 5. **Sustainable Development:** Understand sustainable development, its indicators, measurement, and importance.
- 6. **International Trade Theories:** Learn about inter-regional and international trade, comparative cost theory, Heckscher-Ohlin theory, and exchange rate determination theories.
- 7. **Exchange Rates and Policies:** Study fixed and flexible exchange rates, exchange rate policy in India, free trade vs. protection, terms of trade, and exchange control.

- 8. **Foreign Trade in India:** Examine the changes in foreign trade in India since 1991, balance of trade, and balance of payments.
- 9. **International Monetary Organizations:** Understand the objectives, functions, and benefits of the IMF, World Bank, WTO, and SAARC.
- 10. **Applied International Economics:** Analyze India's adverse balance of payments and the measures to correct it, and understand the foreign trade multiplier.

B. A. (Geography)

The syllabus of geography for undergraduate course has been divided into six semesters through which different theories and practical papers have taught to the students to enhance their knowledge about subjects.

Geography of India (Semester - 1st)

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

Physical Geography-I (Semester 2nd)

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

Physical Geography-II (Semester 3rd)

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

Human Geography (Semester 4th)

During 4th semester the theory paper Human Geography has been introduced and the main aim of this course is to acquaint the students with basics of human geography- nature of man environment relationship and human capability to adopt and modify the environment under its

various conditions from primitive life style to modern living; to identify and understand environment and population in terms of their quality and spatial distribution pattern and to comprehend to contemporary issue facing global community. In practical paper Map Projection, the students have to enable to understand various methods of map making and types of map projection. Map projections are necessary for accurate transformation of 3-D surface. The basic aim of this course it to develop basic understanding of maps and selection of suitable projection for them.

Economic Geography (Semester 5th)

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

Remote Sensing, GIS & Quantitative Methods (Semester 6th)

The theory paper, Introduction to Remote Sensing, GIS and Quantitative methods has been introduced in last semester of UG course. The aim of this course is to introduce the students to modern technology i.e. Remote Sensing its basic concepts and Digital Satellite Imageries, Data set and their application. The students have to learn different statistical methods that will be very fruitful for them. In practical paper the aim of this course is to acquaint the students about aerial photograph and satellite imageries, their process and methodology and also familiarize the students with importance of field work in geography, its type and related requirement and procedure.

BA (HISTORY) COURSE OUTCOME

The Students will be able to Identity how different regional, religious, linguistic and genders identities. The student's learn to identify the various problems by recalling historical events and find the solution on the basis of the past events. To explain the present by understanding the past and how it has evolved. Identify and analyze the significance of historical changes that take place within a society. To understand the international relationship between the Countries. To understand the social and colonial India and their influence on the national movement.

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

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

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

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

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

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

Political Science (B.A.)

Sem-01: Indian constitution

We get the knowledge of fundamental duties & rights. We also get the information about Union, state executives, legislature & judiciary.

Sem-02: Indian Politics

We get to know about our elections & EVM machines. We found the information about our MLA's & MP's jobs & responsibilities. It's also important to know about the roles & responsibilities of our state & central ministers.

Sem-03: Principles of Political Science –I

Get the knowledge of state, its elements, origin & its development. Found the information regarding the distinction between state& society. It also provides the information about sovereignty, its nature & kinds.

Sem-04: Principles of Political Science –II

We get to know about right to information and consumer protection. Also get the knowledge of nation, nationalism & citizenship. Find the information about rights, liberty & equality.

Sem-05: Comparative Politics

We get to know about the voting behaviour of country. It provides us the information about structural functions & political development approaches. Also find the knowledge about constitutionalism.

Sem-06: Comparative constitutions of UK & USA

Students get to know about the comparative study of US & USA for their government & constitutions. We get to know about the rules of Govt. making in other countries like US & USA. We can get comparative elements of constitutions of US & USA.

Course outcomes for UG (B.A. Physical education)

Learning outcomes for the physical education program:-

Graduates will select and create learning experiences that are appropriate for curriculum goals, relevant to learners, show evidence of sequential learning, incorporate modifications for variations in learning styles and performance, and are based on the principles of effective instruction. Graduates will demonstrate competence in movement skills, analyze the performance of motor skills (particularly team and individual sports activities and dance/rhythms), as well as prepare and teach written lesson plans which address student learning of motor skills and analysis and assessment of these skills. Graduates will plan and adapt instruction for diverse student needs including specific accommodations and/or modifications for student exceptionalities and specialized needs. Graduates will demonstrate knowledge of current technology by planning and implementing learning experiences that require students to appropriately use technology to meet lesson objectives as well as use technological applications to facilitate effective assessment and evaluation strategies, and enhance personal productivity and professional practice. Graduates will maintain a healthenhancing level of fitness throughout the program as well as be able to collect and analyze personal fitness data. Graduates will demonstrate effective communication and pedagogical skills, utilize strategies to enhance student engagement and learning, and create appropriate managerial rules and routines in order to create a

Physical Education is a very wide subject in which biological, psychological, physical, health and functional aspects of sports and body are smudged. It is noteworthy that it is such a subject with the help of which human body both internally and externally can be kept healthy.

1-Studems will definitely be able to discharge their duties towards themselves and society though this subject.

2-Under this subject, the students can demonstrate excellently their skills and perfection. Particularly in sports ability, management, leadership, health plan, event management, sports budgeting physiology, teaches methods, sports psychology and research along with getting information regarding to the importance of Physical Education for DIVYANG.

3-The program has been framed in such a manner that students will learn practical knowledge of sports and games, therapeutic modalities well as Physical education fundamentals by touching all aspects of human body, 4. This program is well designed m enhance the capacity of students to underhand universal and specific needs for their career.

5- This programs develop the ability to address the complexities and interface among of self, mental, social national and global priorities Inculcate both generic and subject specific skills to succeed in the employment market and standards of life Promote research, innovation and design (product) development Favouring all the disciplines in physical education

6-This program is very useful for sports person for understand the busies of physical education and improve a mind set for their career.

B.Com. Pass Course

The program outcomes of a B.Com pass course typically include:

Foundational knowledge: Graduates will have a strong foundation in various aspects of commerce, including accounting, finance, economics, business law, and management principles.

Practical skills: Students will develop practical skills through coursework, case studies, and projects, enabling them to apply theoretical knowledge to real-world business scenarios.

Financial literacy: Graduates will possess financial literacy, including the ability to analyze financial statements, manage budgets, and make informed financial decisions.

Analytical and critical thinking: Students will develop analytical and critical thinking skills, allowing them to evaluate business problems, identify opportunities, and propose effective solutions.

Communication skills: Graduates will effectively communicate business concepts, strategies, and recommendations through written reports, presentations, and interpersonal interactions.

Teamwork and collaboration: Students will work effectively in teams, demonstrating collaboration, leadership, and interpersonal skills necessary for success in a professional environment.

Ethical awareness: Graduates will understand the ethical principles and practices that govern business conduct, demonstrating integrity, honesty, and social responsibility in their professional endeavors.

Entrepreneurial mindset: Students will cultivate an entrepreneurial mindset, recognizing opportunities, taking initiative, and innovating within the context of business and commerce.

Adaptability and resilience: Graduates will be adaptable and resilient, able to navigate change, uncertainty, and challenges in the dynamic business environment.

Lifelong learning: Students will recognize the importance of continuous learning and professional development, staying abreast of industry trends, emerging technologies, and evolving business practices throughout their careers.

Bachelor of Commerce (B.Com.)

- Students setting admission for B.Com (Pass course) is expected to imbue with following quality which helps them in their future life to achieve the expected goals.
- The B.com Graduates would be able to acquire basic and fundamentals knowledge and skills for doing business and commercial activities for their choice.
- B.com pass course covers several subjects such as accounting, costing, taxation, marketing, economics, corporate and business laws, management, HR and business etc. This opens up the door for wide range of employment opportunities.
- A b.com graduate can choose from multiple job profiles based on their interests and abilities. A few of them are: - Accountant, finance analyst, portfolio manager, investment analyst, tax consultant.
- The program also empowers the graduates to appear for various competitive exams or choose a profession of their choice such as CA, CS, ICWA, M.COM, MBA etc.
- A B.Com degree holder is well suited to a business career whether as an employee or an entrepreneur.

B. Com (Sem-01)

- > To record the basic journal entries.
- Memorize how to calculate depreciation by applying various methods.
- Maintain the financial statements of a business entity.
- Rectify errors in accounts.
- To apply basic terms of integration in solving practical problems field of as of business.
- To explain basic methods of business calculus, types and methods of interest account and their basic applications in practice.
- To solve problems in the areas of business calculus, simple and compound interest account, use of compound interest account, loan and consumer credit.
- > To discuss effects of various types and methods of interest account.
- Connect acquired knowledge and skills with practical problems in economic practice. Understand how households (demand) and businesses (supply) interact in various market structures to determine price and quantity of a good produced.
- Understand the links between household behavior and the economic models of demand. Represent demand, in graphical form, including the downward slope of the demand curve and what shifts the demand curve.
- Understand the links between production costs and the economic models of supply.
- > Apply the concept of opportunity cost
- > analysed operations of markets under varying competitive conditions
- ▶ Use business terms and concepts when communicating.
- Explain the financial concepts used in making business decision.
- ▶ Use effective communication skills to promote respect and relationship.
- Utilize information by applying a variety of business and industry software and hardware to major business function.
- > Demonstrate a basic understanding of business management.
- > To make effective and impressive communication.
- > To make communication in ethical manner.
- Capable to make persuasive digital communication.
- Capable to make abstract & summaries of proposals.
- > Better presentation and communication using proper body language.

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

B.Com (Sem-02) ¬

- Student can able to make necessary journal entries in the books of record under hire purchase method.
- > Able to maintain royalty and joint venture accounts.
- Easily examine the dissolution of partnership.
- Easily can prepare the journal entries of amalgamations and sale of partnership firms.
- Define basic terms in the areas of business calculus and financial mathematics.
- Explain basic methods of business calculus, types and methods of interest account and their basic applications in practice.
- Solve problems in the areas of business calculus, simple and compound interest account, use of compound interest account, loan and consumer credit.
- Discern effects of various types and methods of interest account.
- Connect acquired knowledge and skills with practical problems in economic practice.
- > Apply marginal analysis to the "firm" under different market conditions;
- Understand the causes and consequences of different market structures;
- Apply economic models to examine current economic issues and evaluate policy options for addressing thisissue.
- Understand the meaning of marginal revenue and marginal cost and their relevance for firm profitability.
- ▶ Use business terms and concepts when communicating.
- Explain the financial concepts used in making business decision.
- ▶ Use effective communication skills to promote respect and relationship.
- Utilize information by applying a variety of business and industry software and hardware to major business function.
- Demonstrate a basic understanding of business management.
- Define various elements internal as well as external affecting business environment. Explain the techniques like SWOT analysis.
- Define the terms like inflation, GDP, etc.
- Define the consequences with regard to BOP.
- Explain the economic trends and effect of Govt. policies as LPG.

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

B.COM (Sem 03)

- Learn about the journal entries of issue of shares and issue of debentures.
- > To know about the meaning of companies and working style of companies.
- > To know about the final accounts of the companies.
- Learn about the valuation method of shares and goodwill and measurement of performance of companies.
- Work with profit prior to incorporation and post incorporation profits in company's accounts.
- Learn about the concept of sources of redemption of debentures and redemption of preference shares.
- Student will able to apply knowledge to solve simple tasks using computer (MS Excel).
- Student will able to independently calculate basic statistical parameters (mean, measures of dispersion, correlation coefficient, indexes)
- Student will able to interpret the meaning of the calculated statistical indicators.
- Student will able to choose a statistical method for solving practical problems.
- Student will able to explain probability theory and probability distributions in relation to general statistical analysis.

 Student will able to Understand and appreciate the need to solve a variety of business- related problems using a systematic approach involving accepted statistical techniques.
- > Learn the difference between valid void and voidable contract.
- Memorize difference between contract of guarantee and indemnity.
- Analysis the rights and duties of pawn or Pawnee under contract of bailment.
- ▶ Learn how to pursue the consumer rights under consumer protection act 1982.
- Know about the concept of company and shares.
 ¬Know about the company law in the India.
- Understand the use of the memorandum of association and article of association in a company, they also learn from this course.
- Use of prospectus in a company.
- Understand the relationship between company and debenture holders.
- > Learn the qualities of human resource manager in an organization.

- Analysis the importance of different methods of training given to the employees in organization. ¬
- > Memorize the difference between on-the-job training and of the job training.
- Learn the participant of industrial relation and recruitment of good industrial relation Program.

≻ B.Com (Sem-04) ¬

- Know about the companies all accounts.
- Get the Knowledge of banking system.
- Learn about working format of companies.
- Understand Mutual funds" investments.
- Find out how a company can dissolve.
- Student will able to apply knowledge to solve simple tasks using computer (MS Excel)
- Student will able to independently calculate basic statistical parameters (mean, measures of dispersion, correlation coefficient, indexes)
- Student will able to interpret the meaning of the calculated statistical indicators.
- Student will able to choose a statistical method for solving practical problems.
- Student will able to explain probability theory and probability distributions in relation to general statistical analysis.
- Student will able to Understand and appreciate the need to solve a variety of business- related problems using a systematic approach involving accepted statistical techniques.
- Can able to learn the conditions of partnership act.
- Critically evaluate conditions and warranties of sale of goods act.
- Aware about rights to information.
- Can able to use negotiable instrument in practical life.
- Student will able to develop in the student an understanding of the free enterprise system and the legal safeguards of the same.
- Student will able to demonstrate clearly and forcibly the generally accepted, but not always documented, proposition that law is an expression of the public will; that a law is valid in the real sense only when it is an expression of the public will.
- Student will able to develop in the student and appreciation of the significant role played by the judiciary in the protection of individual liberty and private property.
- Student will able to develop in the student habits of analytical thinking and logical reasoning as a technique for decision-making.

- Student will able to develop in the student acceptable attitudes and viewpoints with respect to business ethics and social responsibility.
- Student will able to enrich and make more meaningful the study of the other social sciences.
- Students can identify how consumer behaves differently.
- > Able to understand how a product passes from different stages.
- > Able to understand the difference between trademark and branding.
- > Able to describe the customer segmentation, target marketing and positioning.
- Understand different methods of sale promotion.
- Demonstrate a comprehension of the principles of banking law and its relationship to banks and customers.
- > Demonstrate an awareness of law and practice in a banking context.
- Engage in critical analysis of the practice of banking law from a range of perspectives.
- Organize information as it relates to the regulation of banking products and services.

B.Com (Sem-05)

- > Define the procedure of direct tax assessment.
- > Able to file IT return on individual basis.
- > Able to compute total income and define tax complicacies and structure.
- > Able to understand amendments made from time to time in FinanceAct.
- > Differentiate between direct and indirect tax assessment.
- Define the various components of total cost of a product i.e. direct & indirect cost and fixed & flexible cost.
- Determine various levels of material i.e. reorder level, minimum level, maximum level & EOQ for managing working capital.
- Use methods of time-keeping & time-booking and manage idle & overtime.Define the features of overhead or indirect cost of production and basis of allocation and apportionment.
- ➢ Use cost-sheet to compute unit cost of product.
- > Determine basis for computing tender price of a product.
- > Use business finance terms and concepts when communicating.
- Explain the financial concepts used in making accounting management decision.
- Record the basic journal entries.
- > Memorize how to calculate depreciation by applying various methods.
- Use effective communication skills to promote respect and relationship for financial deals. Utilize information by applying a variety of business and industry software and hardware to major financial function.
- > Demonstrate a basic understanding of accounting management.
- Student will able to understand the Australian banking system and describe the role of regulatory bodies in regulating how banks manage their capital.
- Student will able to describe the types of equity securities that companies can use to raise equity capital and how these securities can be listed and traded on the Australian Stock Exchange.

- Student will able to apply different company valuation techniques to determine share prices.
- Student will able to describe the characteristics of different types of debt securities and be able to price them.
- Student will able to describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates.
- Student will able to understand the mechanics and conventions of the foreign exchange market and the motivation of different participants in trading foreign currencies.
- Student will able to understand the basic development of entrepreneurship as aprofession
- Student will have a basic knowledge of human resource management for small business.
- Student will able to identify and implement systems for collecting and analysing information to monitor the performance of a new firm
- > Student will able to understand ton going business operation. \neg
- Student will able to understand the critical roles of marketing research, competitive analysis, consumer-value proposition, and market-entry strategy in the development of a business plan.
- Student will able to describe examples of entrepreneurial business and actual practice, both successful and unsuccessful, and explain the role and significance of entrepreneurship as a career, in the firm, and in society.
- Student will able to understand the importance and role of ethical, sustainability, innovation and global issues for strategic decision making.
 Student will evaluate different modes of entering into entrepreneurship
- Use International Business Environment terms and concepts when communicating.
- Explain the International Business Environment concepts used in making global decision.
- Use effective communication skills to promote respect and relationship for International Business Environment

B.COM (Sem06)

- > Define the procedure of direct tax assessment.
- Able to file IT return on individual basis.
- > Define tax complicacies and structure.
- Aware about IT authorities and their powers.
- Aware about appeal & revision, tax penalties, offences and prosecutions.
- Define the process to compute total cost of a product belong to various production processes.
- > Accumulate total cost of a contract assigned.
- > Able to prepare various budgets like fixed and flexible budgets.
- > Define the terms with regard to variance analysis.
- > Define the terms with regard to BEP analysis.
- > Use business finance terms and concepts when communicating.
- Explain the financial concepts used in making financial management decision.
- Use effective communication skills to promote respect and relationship for financial deals.
- Utilize information by applying a variety of business and industry software and hardware to major financial function.
- > Demonstrate a basic understanding of financial management.
- Student will understand the audit process from the engagement planning stage through completion of the audit, as well as the rendering of an audit opinion via the various report options.
- Student will understand auditors" legal liabilities, and be able to apply case law in making a judgment whether auditors might be liable to certain parties;
- Student will understand to describe the various levels of persuasiveness of different types of audit evidence and explain the broad principles of audit sampling techniques;
- Student will understand to discuss the need for an independent or external audit and describe briefly the development of the role of the assurance provider in modern business society;
- Student will able describe the quality control procedures necessary to ensure that a competent assurance engagement is performed, and apply professional ethics including Code of Conduct to specific scenarios

- Student will explain the internal audit process including the professional standards applicable to the internal audit profession.
- Student will able to Compute the assessable value of transactions related to goods and services for levy and determination of duty liability.
- Student will able to Identify and analyse the procedural aspects under different applicable statutes related to Goods and Service taxation.
- Student will able to understand the basic principles underlying the Goods & Service Tax).
- Student will able to understand Tax liability and taxable entities. Accounting treatment (simple and trilateral transactions).
- Student will able to examine the method of tax credit. Inflows and outflows.
 Outflows: tax imposition, tax exemption, tax deduction.
- > Use International Marketing terms and concepts when communicating.
- > Explain the International Marketing concepts used in making global decision.
- Use effective communication skills to promote respect and relationship for International Marketing.

Course Outcomes

Basics of Computer in B.Com I & II Sem.

Basics of Computer (11346)

In the present scenario the basic need of every commercial, Academic , Research fields are to remain in touch of latest updates and status. This paper is for the students of Commerce as compulsory subject so that the students can get benefits. In first semester the subject introduce the student with the technical platforms. Microsoft Word is being taught in first semester, it enables students for typing related jobs i.e. Reports, Chapters, Formatting, Macros, Mail Merge etc. This course enhances the computer skill of students in the various aspects of day to day life requirements.

Basics of Computer (21346)

In second semester MS Excel is in curriculum and it helps the student in preparing Tables, Graph, Chart. Students can fetch various details from the feed data by using Filters and other utilities . By using MS Excel students can arrange and processed the scattered and unprocessed data. The use of this software tool is quite beneficial for the students. By using Internet tools, surfing skills of students is enhanced and its enable them to get job and various supports. This software tool is helpful in the field of research and benefits to the students.

B.Sc. Pass Course

The program outcomes of a B.Sc. pass course may vary depending on the specific curriculum and institution, but typically include:

Strong foundational knowledge: Graduates will have a solid understanding of the fundamental principles, theories, and concepts in their chosen field of science, whether it be biology, chemistry, physics, mathematics, or a combination thereof.

Practical skills: Students will develop practical skills through laboratory work, fieldwork, and hands-on experiments, enabling them to apply theoretical knowledge to real-world problems and scenarios.

Critical thinking and analytical reasoning: Graduates will possess strong critical thinking and analytical reasoning skills, allowing them to analyze data, evaluate evidence, and draw logical conclusions.

Problem-solving abilities: Students will acquire problem-solving abilities, including the capacity to identify, formulate, and solve scientific problems using appropriate methods and techniques.

Research proficiency: Graduates will be proficient in conducting scientific research, including literature review, experimental design, data collection, analysis, and interpretation.

Communication skills: Students will effectively communicate scientific ideas, findings, and conclusions through written reports, presentations, and discussions, catering to both technical and non-technical audiences.

Quantitative literacy: Graduates will demonstrate quantitative literacy, including proficiency in mathematical and statistical methods relevant to their field of study.

Technological competency: Students will be familiar with relevant technologies and tools used in scientific research and practice, including laboratory equipment, computer software, and data analysis tools.

Ethical awareness: Graduates will understand the ethical principles and practices that govern scientific inquiry, including integrity, honesty, and respect for intellectual property rights.

Lifelong learning: Students will recognize the importance of continuous learning and professional development, staying abreast of new developments, methodologies, and technologies in their field of study.

Course Outcome Chemistry

Semester-1st

After completing this course, the learner will be able to:

- 1. Enable to understand the basis of quantum mechanics and structural idea and relevance in describing shapes of s, p and d orbitals.
- 2. To learn about role of temperature and pressure to establish the state of gases and describe the concept of critical constants of real gases.
- 3. Get knowledge about the electrophile/nucleophile and its role in mechanism of preparation of organic compounds.
- 4. To know the physical properties, morphology and crystalline study of liquid and different type of solids.
- 5. Hand on practice in preparation of solutions, compounds, estimation and determination of physical properties of some compounds.

Semester- 2nd

After completing this course, the learner will be able to:

- 1. Able to understand the theories which governs the shape, structure and ionic behavior, polarizability,ionic structures and concept of Lattice energy of crystals of molecules.
- 2. To know the basics of rates of chemical reactions, the laws and solubility behavior of solutes in different compositions of solvents.
- 3. To know about alkanes, alkene, cycloalkanes and their chemical reactions.
- 4. To understand about weak interactions and bonding in metals.
- 5. Hand on practice for estimation and determination of viscosity, specific refractivity properties of some compounds.

Semester- 3rd

After completing this course, the learner will be able to:

- 1. To learn about the structure of S and P-block elements, their properties and discuss their use in daily life as well as industrial applications.
- 2. To understand about various laws and theories related to eletrochemistry-I and know about their thermodynamic properties.
- 3. To understand about variation of conductance studies with concentration and explain with many phenomenon.
- 4. The fundamental properties, structures and reactivity of organic compounds such alkene, alkyne arenes, alkyl and aryl halide etc.
- 5. Learning about reaction mechanism and predict theoutcome of the reactions. How to distinguish between the organic compounds by use of different chemical tests.

Semester-4th

After completing this course, the learner will be able to:

- 1. Classify d block and f block elements and also know their properties
- 2. Learn about the basic idea of analysis with respect to qualitative as well as quantitative measures

- 3. Know about the first and second law of thermodynamics and also their implications and also know about the concept of chemical equilibrium
- 4. Know about the alcohols, phenols, aldehydes and ketones with respect to their general characteristics and their important reactions
- 5. To get knowledge about identification and confirmation of acidic and basic radicals in a given inorganic salts/mixtures.

Semester-5th

After completing this course, the learner will be able to:

- 1. Know about Metal ligand bonding in transition metal complexes and their thermal and kinetic aspects, magnetic properties and electronic spectra.
- 2. Understanding of Quantum mechanics. Physical properties and molecular structure of soild.
- 3. Learn about Rotational, Vibrational and Raman spectroscopy.
- 4. Study of principle of NMR spectroscopy, understanding of spectra and structure elucidation.
- 5. Know about the classification, nomenclature and structure of carbohydrates and organometallic compounds

Semester-6th

After completing this course, the learner will be able to:

- 1. Know about the various concepts of Acids and Bases and organometallic compounds.
- 2. Know about electronic spectra and photochemistry.
- 3. Know about Solutions, colligative properties and phase rule.
- 4. Know about Bioinorganic chemistry and biological role of inorganic metal ions. Silicones and phosphazenes.
- 5. know about Heterocyclic compounds and Enolates. Synthetic polymers, amino acids, peptide and proteins.

B.Sc-1st Semester (Mathematics)

Program outcomes and course outcomes for Paper-1 (Algebra of matrices & Theory of equations)

Course Outcomes:

- Define matrices, linear equations and determinants, Recall basic vector algebra
- Understand basic concepts like vector spaces and linear dependence
- Understand different types of matrices, Perform matrix algebra with applications
- Understand inverse and rank of a matrix
- Find the relation between the roots and coefficients of an equation
- Solve algebraic equations and inequalities involving the topic of theory of equations
- Understand the fundamental theory of equations and its applications

Program outcomes and course outcomes for Paper-2 (Calculus)

Course Outcomes:

-Understand the concept of limits, continuity, and differentiability

- -Apply differentiation and integration to solve problems
- -Analyse physical and real-world applications
- -Develop mathematical models to solve problems

Program outcomes and course outcomes for Paper-3 (Solid Geometry)

Course Outcomes:

- Find the center and radius of spheres and circles
- Visualize three-dimensional objects using mathematical software
- Understand the basic concepts of the right line

B.Sc-2nd Semester

Program outcomes and course outcomes for Paper-1 (Number Theory & Trigonometry)

Course Outcomes:

- Find quotients and remainders from integer division
- Apply Euclid's algorithm and backwards substitution
- Understand the definitions of congruences, residue classes, and least residues
- Add and subtract integers, multiply integers, and calculate powers, modulo n
- Determine multiplicative inverses, modulo n, and use to solve linear congruences
- Learn about the expansions of trigonometric functions
- Learn about trigonometric functions and identities
- Learn the application of trigonometry in different fields

Program outcomes and course outcomes for Paper-2 (Ordinary differential equations)

Course Outcomes:

- Solve first-order linear and non-linear differential equations
- Solve systems of linear equations and application problems requiring them
- Understand the concepts of Differential Equations
- Solve linear systems of ordinary differential equations

Program outcomes and course outcomes for Paper-3 (Vector Calculus)

Course Outcomes:

- Understand vector algebra and calculus, including vector differentiation and integration
- Apply vector calculus to solve problems in engineering, physics, and other fields
- Analyze and interpret vector fields, including gradient, divergence, and curl
- Use vector calculus to solve problems related to motion, force, and energy

B.Sc-3rd Semester

Program outcomes and course outcomes for Paper-1 (Advanced calculus)

Course Outcomes:

- Understand advanced calculus concepts, including vector calculus and Laplace transforms
- Apply advanced calculus to solve problems in physics, engineering, and other fields
- Analyze and interpret results, and communicate mathematical ideas effectively
- Use computational tools to visualize and analyze advanced calculus concepts
- Demonstrate understanding of the theoretical foundations of advanced calculus

Program outcomes and course outcomes for Paper-2 (Partial Differential Equations)

Course Outcomes:

- Understand the definitions and classifications of PDEs

- Apply mathematical techniques to solve PDEs, including separation of variables and Fourier transforms

- Analyze and interpret solutions to PDEs in various contexts
- Use PDEs to model physical systems, such as heat diffusion and wave propagation

- Demonstrate understanding of the theoretical foundations of PDEs, including existence and uniqueness of solutions.

Program outcomes and course outcomes for Paper-3 (Statics)

Course Outcomes:

- Understand the concepts of forces, moments, and equilibrium
- Apply the principles of statics to solve problems involving forces, moments, and torques

- Analyze and interpret the behavior of structures and mechanisms, including trusses, frames, and machines

- Use free body diagrams and equations of equilibrium to solve statics problems

- Demonstrate understanding of the applications of statics in engineering, physics, and other fields.

B.Sc-4th Semester

Program outcomes and course outcomes for Paper-1 (Sequence and infinite series) Course Outcomes:

- Understand the definitions and properties of sequences and infinite series

- Apply convergence tests, such as the ratio test and root test, to determine the convergence of infinite series

- Analyze and interpret the behavior of power series, Taylor series, and Fourier series

- Use sequences and series to solve problems in calculus, physics, engineering, and other fields

- Demonstrate understanding of the theoretical foundations of sequences and infinite series

Program outcomes and course outcomes for Paper-2 (Special function and Integral transform)

Course Outcomes:

- Evaluate special functions, including Gauss hypergeometric functions, Legendre polynomials and functions, Bessel functions, Hermite polynomials, and Laguerre polynomials

- Apply integral transforms, including Laplace transforms, to solve differential equations and other problems

- Analyze and interpret the properties and behavior of special functions and integral transforms

- Use special functions and integral transforms to model and solve real-world problems in physics, engineering, and other fields

Program outcomes and course outcomes for Paper-3 (Numerical methods and programming in C)

Course Outcomes:

- Understand numerical methods for solving linear and nonlinear equations, interpolation, differentiation, integration, and optimization problems

- Develop algorithms and write programs in C to implement numerical methods

- Analyze and interpret the results of numerical computations, including error analysis and convergence studies

- Use numerical libraries and tools, such as NumPy and MATLAB, to solve numerical problems

- Demonstrate understanding of the theoretical foundations of numerical methods and programming in C

B.Sc-5th Semester

Program outcomes and course outcomes for Paper-1 (Real Analysis)

Course Outcomes:

- Understand the basic properties of real numbers, sequences, and series

- Apply the concepts of convergence, continuity, and differentiability

- Analyze and interpret the behaviour of functions, including uniform continuity and uniform convergence

- Use real analysis to solve problems in calculus, physics, engineering, and other fields

- Demonstrate understanding of the theoretical foundations of real analysis, including the construction of real numbers and the Heine-Borel theorem

Program outcomes and course outcomes for Paper-2 (Group and Ring)

Course Outcomes:

- Understand the definitions and properties of groups, subgroups, homomorphisms, and isomorphisms

- Apply group theory to solve problems in combinatorics, geometry, and computer science

- Understand the definitions and properties of rings, ideals, and quotient rings

- Apply ring theory to solve problems in algebraic geometry, number theory, and computer science

- Demonstrate understanding of the theoretical foundations of group and ring theory, including the Sylow theorems and the Fundamental Theorem of Ring Homomorphism.

Program outcomes and course outcomes for Paper-3 (Numerical Analysis)

Course outcomes :

- Understanding the theoretical and practical aspects of numerical methods

- Implementing numerical methods for various applications
- Establishing the limitations, advantages, and disadvantages of numerical methods
- Applying numerical methods to solve problems
- Coding numerical methods in a modern computer language

B.Sc-6th Semester

Program outcomes and course outcomes for Paper-1 (Real and complex Analysis)

Course Outcomes:

- Apply real analysis to solve problems in various fields.

- Analyze and interpret the behavior of functions, sequences, and series.
- Demonstrate understanding of the theoretical foundations of real analysis.
- Understand the theories of functions of complex variables .
- Apply techniques of contour integration and analytic functions.
- Analyze and make use of the techniques regarding power series to solve integrals .
- Outline proofs of theorems and apply them to solve real and complex integration.

Program outcomes and course outcomes for Paper-2 (Linear Algebra)

Course Outcomes:

- Define what it means for a linear system to be consistent or inconsistent
- Distinguish between homogeneous and nonhomogeneous systems
- Identify special matrices like the zero matrix and the identity matrix
- Solve linear systems of equations using the language of matrices
- Translate word problems into linear equations
- Recognize echelon forms and relate various matrix transformations to geometric illustrations
- Define the inverse of a matrix and compute the inverse of a matrix
- List properties of vectors in R^n and compute an LU decomposition
- Provide a definition of the determinant and use determinants and their interpretation as volumes
- Describe how performing row operations affects the determinant
- Analyze the determinant of a product algebraically and geometrically
- Determine the sign of a permutation and compute the determinant of a matrix via the formula involving permutations

- Compute the determinant of an upper triangular matrix and compute the determinant of a matrix via cofactor expansion

- Describe properties of the determinant and explain what the determinant measures geometrically

- Relate the determinant of three-by-three matrices to the cross product

- Describe how the determinant of a matrix and its transpose are related and describe how the determinant of a matrix and its inverse are related

- Use determinants to calculate the inverse of a matrix

- Describe how the determinant of a product of matrices relates to the determinant of the individual matrices

- Provide an axiomatic description of an abstract vector space and use axioms for abstract vector spaces to discuss examples of abstract vector spaces

- Recognize and use basic properties of subspaces and vector spaces

- Define subspace of a vector space and list examples of subspaces of a vector space
- Determine whether subsets of a vector space are subspaces

- Determine a basis and the dimension of a finite-dimensional space and discuss spanning sets for vectors in R^n

- Discuss linear independence for vectors in R^n and define the dimension of a vector space

- Prove all bases have the same number of elements and prove elementary theorems concerning rank of a matrix

- State the rank-nullity theorem and prove the rank-nullity theorem

- Define the rank of a linear transformation and define row space and column space of a matrix

- Describe a relationship between the row space and column space of a matrix
- For a linear transformation between vector spaces, discuss its matrix relative to given bases
- Given a linear transformation and bases, find a matrix representation for the linear

transformation

- Discuss how those matrices change when the bases are changed

- Identify properties of a matrix which remain the same for all matrices representing the same linear transformation

- Interpret a matrix as a linear transformation from R^n to R^m

- Understand the relationship between a linear transformation and its matrix representation
- Describe geometrically significant linear transformations of the plane to itself
- Interpret a matrix product as a composition of linear transformations

- Interpret the inverse matrix as representing the inverse linear transformation

- Distinguish between a matrix as a table of numbers and a linear transformation as a function

- Define "injective function", "surjective function", and "bijective function"

- Identify when a linear transformation is injective, surjective, or bijective

- Decide whether a linear transformation is one-to-one or onto and how these questions are related to matrices

- Define the image of a linear transformation and prove that the image of a linear transformation is a subspace

- Define the kernel of a linear transformation and prove that the kernel of a linear transformation is a subspace

- Discuss the kernel and image of a linear transformation in terms of nullity and rank of the matrix

- Find the eigenvalues and eigenvectors of a matrix and define eigenvalues and eigenvectors geometrically

- Use characteristic polynomials to compute eigenvalues and eigenvectors
- Use eigenspaces of matrices, when possible, to diagonalize a matrix

- Perform diagonalization of matrices and explain the significance of eigenvectors and eigenvalues

- Find the characteristic polynomial of a matrix and use eigenvectors to represent a linear transformation with respect to a particularly nice basis

- Explain the geometric significance of real versus imaginary eigenvalues for two-by-two matrices

Program outcomes and course outcomes for Paper-3 (Dynamics)

Course Outcomes:

- Understand and use basic terms for the description of the motion of particles, vector functions and the fundamental laws of Newtonian mechanics

- Solve problems relating to the motion of a projectile in the absence of air resistance.

B.Sc. PHYSICS

SEMESTER I

Mechanics

- **Understanding Mechanics**: Grasp fundamental concepts of single and system particle mechanics, and conservation laws of linear and angular momentum.
- **Energy and Motion**: Understand mechanical energy conservation, analyze center of mass and equations of motion for constrained systems.
- Generalized Coordinates and Dynamics: Learn about displacement, velocity, momentum, and study Hamilton's principle and Lagrange's equation.
- **Oscillatory Systems**: Examine linear harmonic oscillators, simple pendulums, and mechanics of Atwood's machine.
- **Rigid Body Dynamics**: Study rotation, moment of inertia, torque, angular momentum, kinetic energy of rotation, and axis theorems.
- **Inertia and Acceleration**: Calculate moment of inertia for different shapes, and analyse acceleration on inclined planes.

Note: By the end of the course, students should have a comprehensive understanding of classical mechanics principles and be able to apply these concepts to solve complex physical problems.

Electricity & Magnetism

- **Mathematical Background**: Understand vectors, vector fields, differentiation, gradient, vector integration, and apply Gauss's and Stokes theorems.
- **Electrostatic Field**: Derive field from potential, solve Laplace and Poisson equations, apply Gauss's Law, and calculate mechanical force and energy.
- **Magnetostatistics**: Learn magnetic induction, flux, solenoid nature, properties of B-fields, paramagnetism, domain theory, and analyse hysteresis.
- **Electromagnetic Theory**: Derive Maxwell's equations, understand displacement current, potentials, boundary conditions, wave propagation, and Poynting theorem.

Note: These outcomes equip students with a comprehensive understanding of fundamental concepts in electricity and magnetism, enabling them to solve related physical problems effectively.

SEMESTER II

Properties of Matter, Kinetic Theory and Relativity

- **Properties of Matter (Elasticity)** Understand elasticity and Hooke's law, learn about elastic constants, study Poisson's ratio, analyse torsion of cylinders, evaluate bending moments in cantilevers, and examine centrally loaded beams.
- **Kinetic Theory of Gases** Understand kinetic theory assumptions, apply the law of equi partition, derive Maxwell distribution, verify experimentally, analyse energy and momentum transport, study gas diffusion, and learn about Van der Waals equation.
- **Theory of Relativity** Understand reference systems, learn Galilean invariance, study Newtonian relativity, explore Michelson-Morley experiment, understand Lorentz transformations, apply velocity addition theorem, and comprehend mass-energy equivalence.

Note: These outcomes focus on understanding the fundamental principles, mathematical derivations, and experimental validations related to properties of matter, kinetic theory, and relativity

Electro Magnetic Induction and Electronic Devices

- Electromagnetic Induction Understand growth and decay of current in RC circuits, analyse resistance and inductance interactions, study capacitance and inductance effects in AC circuits, perform AC circuit analysis, and evaluate series and parallel resonant circuits, including quality factor calculations.
- Semiconductor Diodes Learn about energy bands in solids, understand the Hall effect, study P-N junction diodes, analyse Zener and avalanche breakdown, explore LEDs, comprehend photo conduction, and learn about diode rectifiers and transistor configurations.
- **Transistor Amplifiers and Oscillators** Understand transistor biasing and stabilization, analyse transistor amplifiers, learn amplifier classifications, study feedback in amplifiers, understand principles and conditions for oscillation, and explore types of oscillators like Hartley, Colpitt's, and tuned collector oscillators.

Note: These outcomes aim to provide a comprehensive understanding of electromagnetic induction, semiconductor diodes, and the principles and applications of transistor amplifiers and oscillators.

SEMESTER III

Computer Programming, Thermodynamics

- **Computer Programming** Understand computer organization, binary representation, and develop algorithms with flowcharts for interpretation.
- **Thermodynamics-I** Apply the second law of thermodynamics, Carnot theorem, and understand concepts like absolute zero, entropy, and Joule-Thomson effect.
- **Thermodynamics-II** Derive Clausius-Clapeyron latent heat equation, understand phase diagrams, and apply Maxwell relations to thermodynamic functions and variables.

Note: These outcomes aim to provide a foundational understanding of computer programming concepts and essential thermodynamic principles and applications.

Optics I

- Mastery of Fourier analysis and Transform Techniques: Develop solid understanding of Fourier analysis and transforms, apply them to analyse optical waveforms, and study outputs of rectifiers.
- **Proficiency in Matrix Method for Paraxial Optics:** Utilize matrix methods for analysing optical systems, derive lens formulas, and understand unit and nodal planes.
- Addressing Chromatic and Spherical Aberrations: Identify causes and effects of aberrations, explore remedies like achromatic and aspheric lenses, and enhance optical performance.
- Understanding Interference by Division of Wave front: Analyse interference patterns using Fresnel biprism and Lloyd's mirror, and understand phase changes on reflection.
- Application of Theoretical Concepts to Practical Optical Systems: Integrate theoretical knowledge to design optical systems, apply concepts of Fourier analysis, matrix methods, and aberration correction, and develop problem-solving skills for complex phenomena.

Note: By achieving these outcomes, students will gain a comprehensive understanding of advanced optical principles and techniques, equipping them with the skills necessary for both academic research and practical applications in the field of optics.

SEMESTER IV

Statistical Physics

- Gain foundational knowledge of probability theory and the postulates of statistical physics.
- Master entropy, Boltzmann distribution, and their applications in predicting system behaviours.
- Proficiency in Bose-Einstein and Fermi-Dirac statistics, analysing particle behaviour.
- Explore zero-point energy, Bose-Einstein condensation, and quantum phenomena.
- Apply concepts to derive specific heat and predict thermal properties in diverse systems.

Note: By achieving these outcomes, students will gain a comprehensive understanding of the principles and applications of statistical physics, equipping them with the skills necessary for both academic research and practical applications in the field.

Optics II

- Understand interference by division of amplitude, analyse interference patterns in thin films.
- Study colour in thin films, use Newton's rings to determine light wavelength and lens curvature.
- Grasp Fraunhofer diffraction, measure dispersive power of gratings, resolve spectral lines.
- Comprehend polarization methods and applications in optics.
- Apply optical principles in spectroscopy, imaging, and communication technologies.

Note: By achieving these outcomes, students will gain a comprehensive understanding of advanced optical phenomena and their applications, preparing them for further studies and careers in optical physics and related fields.

SEMESTER V

Solid State Physics

- Understand crystal structures: Explore crystalline forms, periodicity, unit cells, symmetry operations, and Bravais lattices.
- Analyse crystal properties and diffraction: Study crystal planes, Miller indices, X-ray diffraction principles, and K-space.
- Comprehend reciprocal lattice and specific heat: Learn about reciprocal lattices, specific heat theories, and models for solids.

Note: By achieving these outcomes, students will learn crystal structures, diffraction, crystal planes, reciprocal lattices, and specific heat theories in solids.

Quantum mechanics

- Understand wave-particle duality: Explore quantum theory basics, photon concept, key experiments, and Heisenberg's uncertainty principle.
- Learn Schrodinger equation: Derive and apply the time-dependent Schrodinger equation, eigenvalues, and wave function concepts.
- Apply Schrodinger equation: Solve one-dimensional quantum problems, such as the free particle case.

Note: By achieving these outcomes, students will learn quantum theory, wave-particle duality, Schrodinger equation, and its applications to one-dimensional quantum problems.

SEMESTER VI

Atomic Molecular and Laser Physics

- Understand vector atom models, quantum numbers, and spectral lines in alkali spectra, spin-orbit interaction, and term separation via LS and jj coupling.
- Analyze Zeeman and Stark effects, molecular energy quantization, and Raman effect.
- Explore laser physics, including features, Einstein's coefficients, laser mechanisms, and applications of He-Ne and RUBY lasers

Note: These outcomes provide a comprehensive understanding of atomic and molecular physics concepts and laser technology, preparing students for advanced studies and applications in various fields.

Nuclear Physics

- Understand nuclear properties, binding energy, stability, and measurement techniques for nuclear mass, charge, and size.
- Analyse interactions and energetics of charged particles (alpha and beta) and gamma rays, including decay processes and absorption.
- Explore nuclear reactions, reactors, and detection techniques, including principles, construction, and uses of various accelerators and detectors.

Note: These outcomes provide a solid understanding of nuclear physics concepts, measurement techniques, particle interactions, and practical applications of nuclear technology