



**Gokhale Institute
of Politics and
Economics**

(Deemed to be University)

GOKHALE INSTITUTE OF POLITICS AND ECONOMICS

Deemed to be University u/s 3 of the UGC Act, 1956

PUNE 411004

B.Sc. ECONOMICS (DATA SCIENCE)

PROGRAM STRUCTURE & SYLLABUS

Rationale for the Programme

The study of “Economics and Data Science” blends two mutually relevant subjects into one, enabling students to develop a good understanding of the various core concepts of economics and data science that facilitates them in carrying out various responsibilities in the field of data-driven Economics. For instance, data science reasoning or principles were considered an essential foundational skill for corporate firms working in diverse areas. In addition, this emphasis on dual, yet related, fields through a single degree program provides students with the economic understanding and institutional knowledge to examine a given situation using data science tools like, R Programming Language, database management systems, Introduction to Artificial Intelligence (AI) and Machine Learning (ML), prompt engineering and topics related to Generative AI. This interdisciplinary program aims to help the learner become industry-ready by bridging the gap between industry expectations and classroom teaching.

Additionally, the key focus of this course would be on the compulsory requirement of ‘Apprenticeship in the identified industry.’ This will train and prepare the economics students for the diverse roles in the market/industry.

Why Economics and Data Science?

In a world driven by data and defined by decisions, pairing Economics with Data Science empowers students to not only understand the 'why' behind choices, but also predict the 'what's next' with precision.

This unique combination cultivates critical thinkers who can quantify trends, model outcomes, and offer actionable insights in real time. It bridges the gap between economic theory and data-driven execution, a skillset increasingly sought after across industries. To nurture such future-ready professionals, Gokhale Institute of Politics and Economics launches its Apprenticeship-Embedded B.Sc. in Economics and Data Science, offering students the opportunity to learn as they apprentice with industry, gaining firsthand exposure to corporate demands before they graduate.

The details Apprenticeship Embedded Undergraduate Programme in B.Sc. Economics (Data Science) is as follows.

Programme Overview

The four-year AEDP UG programme is designed to provide students with a combined understanding of **Economics and Data Science** with a key focus on **embedded apprenticeships**. This course is designed for a total of 160 credits, compliant with the NEP 2020 guidelines, which includes 2 semesters of apprenticeship, offering a total of 40 credits. This will focus on theoretical rigour, skill development, and industry experience. As per the UGC’s multiple exit-

entry framework, the program offers multiple entry and exit options, catering to diverse academic and professional aspirations.

Additionally, this program is designed to provide students with a strong foundation in economics and data science while promoting flexibility, interdisciplinary learning, skill development and on-the-job learning through 1 year of apprenticeship in the industry. It also includes the right mix of courses on the **Ability and Skill Enhancement Courses (ASECs)** and **Value-Added Courses (VACs)**, ensuring holistic skill development of the students.

Program Objectives:

- To impart a strong theoretical grounding in Economics.
- To develop practical skills in Data Science and analytics.
- To offer industry experience through embedded apprenticeships.
- Bridging gap between expectations by the industry and classroom teaching.
- To prepare students for careers in policy-making, data-driven planning, and economic analysis.

Program Highlights:

- Integrates Economics with Data Science.
- Covers tools/software like R, Python, AI, ML, and Prompt Engineering.
- NEP aligned a 4-year undergraduate Degree with an Apprenticeship.
- One-year compulsory industry apprenticeship in the final year (Semesters 7 & 8).
- Multiple Entry/Exit Options.
- Strong foundation in economic theory, quantitative reasoning, and policy analysis.

Program Outcomes:

Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate /postgraduate program of study.

Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

Critical thinking, Problem solving and Analytical reasoning: Capability to apply analytic thought to a body of knowledge; analyses and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories, philosophies.

Acquiring research-related skills, scientific reasoning and reflective thinking: A sense of inquiry and capability for asking relevant/appropriate questions; ability to recognize cause-and-effect relationships, define problems, formulate and test hypotheses, analyses, interpret and draw conclusions from data; ability to plan, execute and report the results of an experiment or investigation.

Employability Options: All the courses along with mandatory apprenticeship aim to bridge the gap between classroom teaching and industry requirements thereby preparing them for roles in diverse financial management, market research, business planning, etc.

Program Specific Outcomes:

- a) PSO 1: The program provides a firm basis for much of the advanced thinking and analytical skills in the Economics discipline.
- b) PSO 2: It helps the student to learn the mathematical and statistical techniques necessary for a thorough understanding of the discipline
- c) PSO 3: This program will make students familiar with economic theories and their relevance, statistical & quantitative techniques and applied research in a wide variety of fields within economics.
- d) PSO 4: The program is thoughtfully designed to instil sustainability and foster a spirit of lifelong learning. It enables students to become eligible for a wide spectrum of competitive examinations, including but not limited to, SSC, civil services, EXIM Bank, RBI and Bank Probationary Officer roles. Graduates are also

well-prepared for careers in media, NGOs, leading think tanks, and prestigious government research institutions such as NITI Aayog, Economic Advisory Council and the Reserve Bank of India. Furthermore, the apprenticeship component in the fourth year ensures that students gain hands-on industry exposure, making them fully industry-ready as they graduate.

**BSc Economics (Data Science)
4-Year AEDP Program
(2025 - 2029)**

Course Structure (Semester I)

Semester	Course Catalogue	Course Title	Credits
Semester I	Core Course	Principles of Economics	2
Semester I	Core Course	Indian Economy	2
Semester I	Core Course	Introduction to Excel	2
Semester I	Minor Course	Introduction to Statistics	4
Semester I	Inter-disciplinary Course	Mathematics for Economics	4
Semester I	Ability Enhancement Course	Languages: French/German (Level 1)	2
Semester I	Skill Enhancement Course	Basic Financial Methods	2
Semester I	Value Added Course	Yoga and Mental Wellness	2

Course Structure (Semester II)

Semester	Course Catalogue	Course Title	Credits
Semester II	Core Course	Microeconomics - I	4
Semester II	Core Course	Macroeconomics - I	4
Semester II	Minor Course	Intermediate Statistics	2

Semester II	Minor Course	Programming with R	2
Semester II	Inter-disciplinary Course	Mathematical Economics	2
Semester II	Ability Enhancement Course	Languages: French/German (Level 2)	2
Semester II	Skill Enhancement Course	Introduction to Cost and Management Accounting	2
Semester II	Value Added Course	Indian Knowledge System	2

Credit Structure (As per Curriculum and Credit Framework Guidelines by UGC 2022)

Semester	Major	Minor	Multi-disciplinary	Ability Enhancement	Skill Enhancement	Value Added	Apprenticeship	Research project / Dissertation	Total credits
1	6	4	4	2	2	2	0	0	20
2	8	4	2	2	2	2	0	0	20
3	8	4	2	2	2	2	0	0	20
4	8	8	0	2	2	0	0	0	20
5	10	8	0	0	2	0	0	0	20
6	20	0	0	0	0	0	0	0	20
Total	60	28	8	8	10	6	0	0	120

*The fourth year will be entirely dedicated to apprenticeship worth 40 credits.

Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	
2	Course Title	French
3	Programme	BSc.
4	Semesters	Semester: I
5	Nature of the course	Major /Minor / Elective / Core / Compulsory / Elective
6	Credit	02
7	Level	U.G.
8	To be implemented from Academic Year	From the Academic Year: 2025-26

Introduction: This program is designed for absolute beginners who wish to take their first steps in learning French, one of the most widely spoken and culturally rich languages in the world. Over the span of 25 hours, you will acquire the essential tools to communicate in everyday situations, both orally and in writing. The course focuses on building a solid foundation in grammar, vocabulary, and pronunciation while emphasizing practical communication skills.

Rationale : This Basic French Course (25 hours) is designed to give beginners a solid foundation in the language by combining essential grammar, vocabulary, and communication skills. Learners will gain the ability to introduce themselves, ask and answer basic questions, use everyday expressions, and engage in simple interactions in real-life contexts. With a focus on practical usage and speaking practice, the course provides an accessible and engaging entry point into French while preparing learners to progress confidently to higher levels.

Learner's Learning Outcomes/Course Outcomes:

At the end of this course, the learner will be able to

CO 1	To understand concepts related to French grammar (articles, pronouns, verbs) and basic vocabulary (numbers, time, professions, nationalities, places, and classroom objects).
CO 2	To analyse concepts related to sentence formation, question patterns (formal/informal), and the functional use of verbs (<i>être, avoir, aller, regular ER/IR/RE verbs</i>).
CO 3	To apply concepts related to everyday communication, including greetings, self-introduction, introducing others, asking/answering questions, and describing people, objects, and places.

CO 4	To evaluate one's ability to engage in simple spoken and written interactions in French by participating in role plays, dialogues, and short written tasks.
CO 5	
CO 6	
Course Objectives Skill-based: - To develop the ability to communicate in basic French through speaking, listening, reading, and writing activities. - To practice accurate pronunciation and intonation for clear oral communication. - To engage in simple real-life interactions such as greeting, introducing oneself, asking/answering questions, and describing people or places. Knowledge-based: - To acquire fundamental grammar concepts including articles, pronouns, basic verb conjugations (<i>être, avoir, aller, regular ER/IR/RE verbs</i>), negation, and question forms. - To build essential vocabulary related to greetings, numbers, time, nationalities, professions, places, and classroom objects. - To understand the use of basic sentence structures for everyday communication. Value-based: - To appreciate the importance of learning a foreign language as a tool for global communication and cultural awareness. - To foster confidence, openness, and curiosity in learning and using a new language. - To encourage collaboration, respect, and active participation in classroom interactions and role plays.	

Unit	Course Content	No of Lectures
I	Foundations of French Grammar: French alphabet & pronunciation, definite & indefinite articles, personal subject pronouns. Vocabulary: Alphabet, greetings, polite phrases, numbers 0–20, classroom objects, days, months, seasons. Skills: Greeting formally/informally, introducing oneself, asking and answering “What is this?”, talking about dates.	07

II	Identity and Description • Grammar: <i>Être</i> (to be), <i>Avoir</i> (to have), singular & plural nouns, basic adjectives. • Vocabulary: Nationalities, countries, professions, family members. • Skills: Introducing yourself with nationality and profession, describing people and simple objects, introducing others.	05
III	Verbs and Actions • Grammar: Regular –ER, –IR, –RE verbs; basic negation (<i>ne... pas</i>). • Vocabulary: Hobbies, everyday activities, descriptive adjectives. • Skills: Talking about likes/dislikes, describing people/things, saying what you do and don't do.	07
IV	Numbers and Time • Grammar: Numbers 21–9999, question forms (intonation, <i>est-ce que</i>, inversion). • Vocabulary: Numbers, prices, currency, time expressions. • Skills: Giving phone numbers and addresses, asking/saying prices, telling the time (12h & 24h clock), asking questions politely.	05
V	Places and Existence • Grammar: <i>Aller</i> + contracted articles (<i>au, à la, aux, à l'</i>), <i>Il y a</i> (there is/are), countries with prepositions (<i>en, au, aux</i>). • Vocabulary: Places in town, countries & capitals. • Skills: Talking about going to places, describing your city, saying where you are from/going, locating objects and places.	06
VI		
	MODULE WISE SUGGESTED READINGS (APA Style)	
I	Rochester, M. B. (2008). <i>Easy French step-by-step</i> . McGraw Hill. (Chapters 1–2: Alphabet, greetings, articles, pronouns)	
II	Kurbegov, E. (2008). <i>Practice makes perfect: Basic French</i> . McGraw Hill. (Lessons on <i>être, avoir</i> , nationalities, professions, family vocabulary)	
III	Rochester, M. B. (2008). <i>Easy French step-by-step</i> . McGraw Hill. (Chapters on regular -ER, -IR, -RE verbs, negation)	
IV	Kurbegov, E. (2008). <i>Practice makes perfect: Basic French</i> . McGraw Hill. (Units on numbers, question forms, and time expressions)	

V	Graveline, C., & Mérieux, R. (2012). <i>Alter Ego + A1: Méthode de français</i> . Hachette FLE. (Lessons on <i>aller</i> , <i>il y a</i> , places in town, countries with prepositions)	
	Teaching Pedagogy • Lecture • Group Discussion • Videos • Case study • Data Analysis	
	Evaluation Method Continuous Evaluation • Quiz • Assignment / viva voce • Written Test End-semester Assessment • Written Test	

Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	
2	Course Title	Indian Economy
3	Programme	B.Sc. Economics (Data Science)
4	Semesters	1
5	Nature of the course	Major
6	Credit	02
7	Level	U.G.
8	To be implemented from Academic Year	2025

Introduction

This course introduces students to the evolution, current trends, and sectoral composition of the Indian economy. It covers key themes such as agriculture, industry, services, poverty, unemployment, inequality, planning, liberalisation, and contemporary policy debates

Rationale The course on Indian Economy is designed to provide students with an understanding of the structure, growth, and challenges of the Indian economy. It equips learners with analytical tools to critically evaluate economic reforms, development strategies, and policy initiatives.	
Learner's Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able	
CO1	To explore key milestones and policy shifts in India's economic journey since Independence, analyzing their rationale and implications.
CO2	To connect historical economic developments with contemporary issues to provide students with a contextual understanding of India's economic challenges and opportunities.
CO3	To foster critical thinking by evaluating the impact of economic policies on diverse sectors and stakeholders, encouraging students to assess their effectiveness.
CO4	To cultivate research skills and awareness of current economic discourse through curated readings from academic sources, newspapers, and online resources.
Course Objectives Knowledge-based: To familiarise students with key issues such as growth, poverty, inequality, unemployment, and sectoral developments in agriculture, industry, and services. Skill based: To train students in analysing economic data, reports, and policy documents related to the Indian economy. Value-based: To cultivate sensitivity towards socio-economic challenges such as poverty, inequality	

Unit	Course Content	No of Lectures
I	Module 1: Planning in India Planning in India: What was attempted? What was achieved? What was lost? Nationalisation and Privatisation: The Past, Current and Future	6
II	Module 2: Economic Reforms in India The need for Reforms: Farm laws, Role of Private Sector in Agricultural Sector Examining the transformation of India from a slow growth economy to a high growth economy. A Critique of Liberalization in India: Analysing the shortcomings, the reasons behind them, and the steps that still need to be taken. Problem of Missing Middle, Role of Manufacturing Sector in India's Growth Trajectory.	8

III	Module 3: Basic Parameters of the India economy Overview of the Indian Economy: Trends in Composition and rate of growth of Output (various sectors). Structural changes in the economy; Changes in Trends in Composition and rate of growth of Employment: various sectors. Trends in Savings and Investments, Trends in Per capita Income, Population and Demographic Dividend. Indian economy in the World Economy: How does India fare in comparative terms	8
IV	Module 4: Poverty, Unemployment and Social Security in India Measurement of Poverty, Income, and Multidimensional Poverty. Unemployment - Trends and Features. Need for Social Security in India: Midday meals, right to Work-Employment Guarantee Scheme, Right to Education, Right to health	8
	MODULE WISE SUGGESTED READINGS (APA Style)	
I	Essential Reading Module I: Readings Balakrishnan P. (2022) Indian Economy from Nehru to Modi, Permanent Black, New Delhi, Introduction.	
II	Essential Reading Module II: Readings Kapila Uma 2022 Indian Economy: Performance and Policies, 22nd edition, Academic Foundation, Chapter. 3 – India's economy at Independence Additional Reading Desai Meghnad (2017) The Raisina Model, Penguin, New Delhi. Introduction	
III	Essential Reading Module 3 Balakrishnan P. (2022) Indian Economy from Nehru to Modi, Permanent Black, New Delhi. Chap 3- Return to the World; Chap 4- Momentum Lost. Additional Reading Mehta Pratap Bhanu (2003) The Burden of Democracy, Penguin, New Delhi. Introduction	
IV	Essential Reading Dreze J and Sen A. India's Uncertain Glory NITI Aayog: India: National Multidimensional Poverty Index: Baseline Report Based on	

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	NFHS -4 (2015-16). Additional Reading Desai Meghnad (2017) The Raisina Model, Penguin, New Delhi. Chap 3 – The Economy: a Late Developer	
	Teaching Pedagogy • Lecture • Group Discussion • Videos	
	Evaluation Method Continuous Evaluation • Quiz • Assignment / viva voce • Written Test End-semester Assessment • Written Test	

Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	
2	Course Title	Principles of Economics
3	Programme	B.Sc. Economics/ B.Sc. Economics (Data Science)
4	Semester	1
5	Nature of the course	Minor
6	Credit	02
7	Level	U.G.
8	To be implemented from Academic Year	2025

Introduction

The course provides a systematic understanding of the basic principles of microeconomics and macroeconomics. It covers scarcity, opportunity cost, demand and supply, elasticity, market structures, national income, inflation, unemployment,

and fiscal and monetary policies. Through a blend of theory and application, students will learn to interpret economic phenomena and apply reasoning to real-world issues	
Rationale This course is designed to introduce undergraduate students to the fundamental concepts of economics and their practical relevance. It aims to build a strong foundation in economic reasoning, enabling students to analyse individual, business, and policy-level decisions in conditions of scarcity.	
Learner's Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able to	
CO 1	To understand fundamental concepts of microeconomics and macroeconomics.
CO 2	To apply economic reasoning to analyse pricing and market decision-making.
CO 3	To analyse the effects of government policies, market structures, and economic fluctuations
CO 4	To evaluate contemporary economic issues and propose policy suggestions using theoretical frameworks.
Course Objectives knowledge based : skill based : value based:	

Unit	Course Content	No of Lectures
I	Ten Principles of Economics Market Forces of Demand and Supply Elasticity and Its Applications Price Ceiling and Price Floor	10
II	Supply, Demand and Government Policies Firms in a Competitive Market Cost of Production	10
III	Public Goods Designing the Tax System Measuring the Cost of Living	10
	MODULE WISE SUGGESTED READINGS (APA Style)	
I	Essential Reading 1) Principles of Economics- N Gregory Mankiw	
	Teaching Pedagogy	

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	• Lecture • Group Discussion • Case study	
	Evaluation Method Continuous Evaluation • 3 Quizzes of 5 Marks (Best two) • Assignment / viva voce • Mid-Semester Exam	

Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	
2	Course Title	Yoga and Mental Wellness
3	Programme	B.Sc. Economics / B.Sc. Economics (Data Science)
4	Semesters	1
5	Nature of the course	
6	Credit	02
7	Level	U.G.
8	To be implemented from Academic Year	2025

Introduction

Yoga is one of the six systems of Indian Philosophy, which has been systematised by Sage Patanjali in the form of aphorisms. As a part of their graduation students should have an introduction to practice and theory of this ancient subject.

Rationale

While yoga is practised universally today, it can be tailor made to suit each individual's needs. One can experience the immense potential hidden in this comprehensive practice with the help of a well-trained teacher.

Learner's Learning Outcomes/Course Outcomes:

At the end of this course, the learner will be able to.....

CO 1	To understand concepts related to role of body and mind through simple and basic Yogasana for health and harmony
CO 2	To analyse concepts related to mind as explained through Yoga sutras

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CO 3	To apply concepts related to mind in behavioural aspects, self awareness, self development.
CO 4	To evaluate one's own understanding about the subject
CO 5	
CO 6	
Course Objectives	
value based:	

Unit	Course Content	No of Lectures
I	Introduction to simple body movements and asana (Asana categories 1-4 as given in syllabus)	10
II	Introduction to advance asana (Asana categories 5-8 as given in syllabus) and role of breath in asana	5
III	Theoretical aspects	5
IV		
V		
VI		
MODULE WISE SUGGESTED READINGS (APA Style)		
I	Iyengar , B.K.S., (1966), Light on Yoga, George Allen & Unwin Iyengar, B.K.S., (2001), Yoga – Path to Holistic Health, D.K Publications	
II	Indian Yoga International Journal of Yoga and Allied Sciences (PDF) Yoga Origin, History and Development in India A Comprehensive Review of Yoga Research in 2020 - PubMed	
III		
IV		
	Teaching Pedagogy ● Lecture ● Practicals ● Group Discussion	

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	Evaluation Method Continuous Evaluation • Practical 20 marks • Assignment 20 marks • Viva voce 10 marks	

Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	
2	Course Title	Introduction to Cost and Management Accounting
3	Programme	B.Sc Economics (Data Science)
4	Semesters	Semester: 1
5	Nature of the course	Major /Minor / Elective / Core / Compulsory / Elective
6	Credit	02
7	Level	U.G.
8	To be implemented from Academic Year	From the Academic Year: 2025

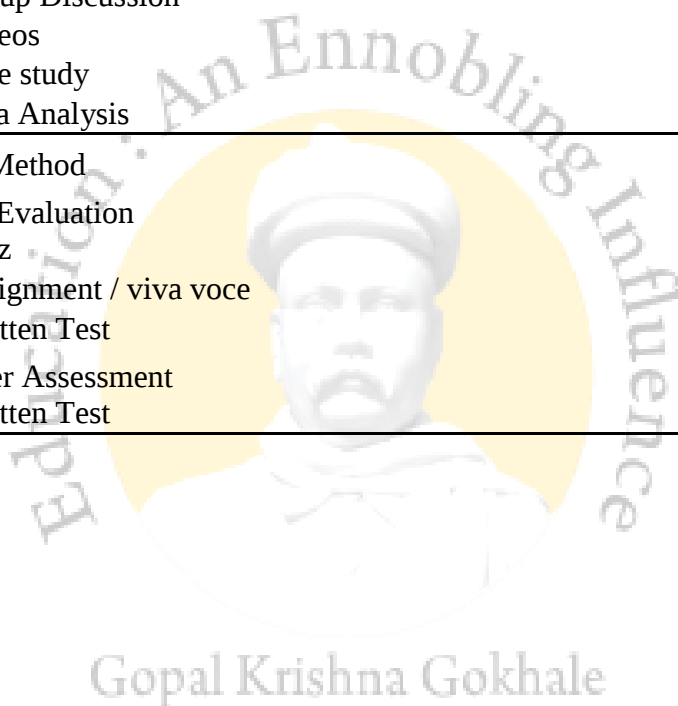
Introduction Accounting is often regarded as the language of business, providing essential financial information necessary for decision-making, planning, and control. This course aims to introduce students to the fundamentals of cost and management accounting, including core concepts, cost sheet preparation, costing methods, marginal costing, and budgeting. It will help students build a conceptual foundation and develop practical skills for application in economics and business contexts.	
Rationale A solid foundation in cost and management accounting is crucial for understanding business operations, monitoring financial health, and supporting sound economic decision-making. The course equips students to interpret cost data, prepare cost statements, analyze costing techniques, and use accounting information for strategic planning and control in modern organizations.	
Learner's Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able to.....	
CO1	Define and explain the fundamental concepts, scope, and objectives of cost and management accounting.
CO2	Prepare and analyze cost sheets; classify and allocate cost components such as materials, labour, and overheads.
CO3	Apply various costing methods—job, batch, process, and activity-based costing—to practical scenarios.
CO4	Perform marginal costing and break-even analysis for management decisions.
CO5	Understand and implement basic budgeting and cost control techniques including standard costing and variance analysis.
Course Objectives Knowledge-Based Outcomes	

Understand cost accounting principles, terminologies, and frameworks Recognize the significance of cost data for organizational planning and control Skill-Based Outcomes Prepare cost sheets and statements Apply budgeting, costing, and analysis tools for decision-making Value-Based Outcomes Develop analytical thinking for interpreting cost and financial data
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Unit	Course Content	No of Lectures
I	Basic Concepts in Cost and Management Accounting • Meaning, scope, and objectives of cost accounting • Distinction between cost, management, and financial accounting • Cost terminologies: direct, indirect, fixed, variable, semi-variable costs • Introduction to cost centers and cost units	5
II	Cost Sheet and Elements of Cost • Components: materials, labour, overheads • Preparation and format of a cost sheet • Allocation, apportionment, and absorption of overheads • Practical application of cost sheets in business decision-making	5
III	Costing Methods • Overview: Job costing, batch costing, process costing • Features and suitability of each method • Simple calculations using job and process costing • Comparison with activity-based costing (ABC)	5
IV	Marginal Costing and Break-Even Analysis • Meaning and applications of marginal costing • Absorption costing compared with marginal costing • Contribution, profit-volume ratio, margin of safety • Break-even charts and analysis for decision-making	5
V	Budgeting and Cost Control • Concept and need for budgeting	5

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	Types of budgets (fixed, flexible, master)	
	- Budgetary control techniques - Standard costing and variance analysis basics	
	MODULE WISE SUGGESTED READINGS (APA Style) - Horngren, C. T., Datar, S. M., & Rajan, M. V. (2015). Cost Accounting: A Managerial Emphasis. Pearson. - Khan, M.Y., & Jain, P.K. (2018). Management Accounting. Tata McGraw Hill.	
	Teaching Pedagogy - Lecture - Group Discussion - Videos - Case study - Data Analysis	
	Evaluation Method Continuous Evaluation - Quiz - Assignment / viva voce - Written Test End-semester Assessment - Written Test	



Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	C-01
2	Course Title	Introduction to Calculus for Economics
3	Programme	B.Sc. Economics/B.Sc. Economics (Data Science)
4	Semesters	Semester: 1
5	Nature of the course	Major
6	Credit	04
7	Level	U.G.
8	To be implemented from Academic Year	2025-26

Introduction This course introduces fundamental concepts of calculus and their applications in economics. It covers differentiation, partial differentiation, series expansions, and optimization techniques for single and multivariable functions, and an introduction to integral calculus. The subject equips students with analytical tools to interpret and solve real-world economic problems.	
Rationale Economics often requires mathematical tools to analyse relationship among different variables, rate of growth, elasticity, techniques for optimization etc. Calculus enables the understanding of these concepts. This course emphasizes differentiation, optimization, and integration techniques with direct applications in economics.	
Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able to :	
CO1	Interpret the results of derivatives to draw meaningful economic conclusions.
CO2	Construct Taylor and Maclaurin series expansions for single-variable functions.
CO3	Analyse the role of exponential and logarithmic functions in economics.
CO4	Apply techniques of constrained and unconstrained optimization to make meaningful economic decisions such as utility maximization, cost minimization, and output optimization.
CO5	To employ integration methods to evaluate areas, accumulated values, and economic measures like consumer and producer surplus.
Course Objectives	

Knowledge based: To develop an understanding of the fundamental concepts of differentiation, integration, and optimization. Skill based: To interpret mathematical results in terms of their economic significance for problem-solving. Value based: To cultivate logical reasoning and critical thinking in approaching economic problems through calculus
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Unit	Course Content	No of Lectures
I	Module I: An Introduction to Differentiation Functions, Graphs, Limits, Continuity, The Derivative, Rules of differentiation, Increasing and Decreasing Functions, The Chain Rule, Concavity, Convexity, The Mean Value Theorem, L'Hospital's Rules, Implicit Differentiation	18
II	Module II: Differential Calculus Partial Differentiation, Taylor's Theorem, Taylor series, Maclaurin Series, Exponential Series, Applications of exponential and logarithmic functions	12
III	Module III: Optimization Unconstrained optimization and applications, Single variable, Multivariate optimization, Local and global minima and maxima, Constrained optimization, The Lagrange Multiplier	15
IV	Module IV: Integral Calculus Calculus as the antiderivative, Area under the curve, Basic formulae, Definite Integrals, Integration by Parts, Integration by Substitution	15
	MODULE WISE SUGGESTED READINGS	
I	Essential Reading: 1) Dowling, E. T. (2001). Schaum's outline of introduction to mathematical economics (3rd ed.). McGraw-Hill. Additional Reading: 1) Simon, C. P., & Blume, L. (1994). Mathematics for economists. W. W. Norton & Company. 2) Bartle, R. G., & Sherbert, D. R. (2000). Introduction to real analysis (3rd ed.). John Wiley & Sons. 3) Sydsäter, K., Hammond, P. J., Strøm, A., & Carvajal, Á. (2021). Essential Mathematics for Economic Analysis (6th ed.). Pearson Education.	

II	Essential Reading: 1) Dowling, E. T. (2001). Schaum's outline of introduction to mathematical economics (3rd ed.). McGraw-Hill. Additional Reading: 1) Simon, C. P., & Blume, L. (1994). Mathematics for economists. W. W. Norton & Company. 2) Sydsäter, K., Hammond, P. J., Strøm, A., & Carvajal, Á. (2021). Essential Mathematics for Economic Analysis (6th ed.). Pearson Education. 3) Chiang, A. C. (2005). Fundamental methods of mathematical economics (4th ed.). McGraw-Hill.	
III	Essential Reading: 1) Dowling, E. T. (2001). Schaum's outline of introduction to mathematical economics (3rd ed.), McGraw-Hill. Additional Reading: 1) Simon, C. P., & Blume, L. (1994). Mathematics for economists. W. W. Norton & Company. 2) Sydsäter, K., Hammond, P. J., Strøm, A., & Carvajal, Á. (2021). Essential Mathematics for Economic Analysis (6th ed.). Pearson Education. 3) Chiang, A. C. (2005). Fundamental methods of mathematical economics (4th ed.). McGraw-Hill.	
IV	Essential Reading: 1) Dowling, E. T. (2001). Schaum's outline of introduction to mathematical economics (3rd ed.). McGraw-Hill. Additional Reading: 1) Simon, C. P., & Blume, L. (1994). Mathematics for economists. W. W. Norton & Company. 2) Chiang, A. C. (2005). Fundamental methods of mathematical economics (4th ed.). McGraw-Hill. 3) Sydsäter, K., Hammond, P. J., Strøm, A., & Carvajal, Á. (2021). Essential Mathematics for Economic Analysis (6th ed.). Pearson Education.	
	Teaching Pedagogy • Lecture • Group Discussion • Videos • Case study • Problem Solving/Practice sessions	

	Evaluation Method Continuous Evaluation • Quiz(MCQs) • Assignment / Presentation • Mid-term Exam (Written Test) End-semester Assessment • Written Test	
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Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	
2	Course Title	German for Beginners
3	Programme	B.Sc. Economics/B.Sc. Economics (Data Science)
4	Semesters	Semester: I
5	Nature of the course	Elective
6	Credit	02
7	Level	U.G.
8	To be implemented from Academic Year	From the Academic Year: 2025

Introduction Netzwerk neu A1.1 Textbook for International Eams A1 To enable students to understand the basic level of Vocabulary and Grammar Structures and use them in respective situations , related to real life situations
Rationale To understand the basic communication and communicate with others in Day to Day life situations

Learner's Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able to communicate in day to day life situations and understand the communication of others The learner will have information about Germany in relation to Europe, some information about Culture, innovations, main Industries Society. The learner will have the vocabulary and grammar structures and form sentences.	
CO1	To understand concepts related to self introduction, family, transport, eating and drinking, ordering in a restaurant, study, living in a city, renting a room, student life. Situational as well as vocabular and grammar structures.
CO2	To analyse concepts related to simple structures, and narrating in present and past tense, cultural differences, and in the end to understand own culture in relation with other
CO3	To apply concepts related to family, transport, supermarket, hobbies, holidays, festivals in form of narration, writing a short text, asking questions, requesting others, answering affirmatively and also negatively
CO4	To evaluate ___ language skills speaking, writing, reading
CO5	Enable students to write Short dialogs, E mail, Blog, Whatsapp Messages, and do telephonic conversations
CO6	To understand the main landmarks of the country, social structure
Course Objectives knowledge based : reading skills to be able to read short texts, communication through writing mail, whatsapp message skill based : listening and speaking and giving information to others for topics such as Train Time Table, Cooking Recipes, Hobbies, job Activities, understanding the frame of reference value based: understand the cultural differences at a broad level and understand own culture in comparison, to realise, that people think and act at emotional level more or less with little difference	

Unit	Course Content	No of Lectures
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I	Chapter 1 Textbook, Exercise Book Self Introduction, introducing others, Forms of Greeting, Numbers, Alphabet	6
II	Chapter 2 Textbook , Exercise Book Hobbs, Free Time Activities, and Grammar , Verbforms	6
III	Chapter 3 and 4 City information Mealtimes, favourite food items, favourite drinks and shopping Groceries	6
IV	Chapter 5 Birthday Celebration, inviting others, writing invitation And explaining the Route and asking for the route	6
V	Chapter 6 Restaurant, Café situation, ordering in a restaurant, reading a menu card,, paying the bill	6
VI		
	MODULE WISE SUGGESTED READINGS (APA Style)	
I	Essential Reading Text Book Chapters Additional Reading	
II	Essential Reading Exercise Books Additional Reading	
III	Essential Reading Worksheets Additional Reading	
IV	Essential Reading Dialogs in the Textbook Additional Reading	
	Teaching Pedagogy ● Lecture ● Communicative form ● Group Discussion ● Videos ● Of the Textbook Topics ● Case study ● Data Analysis	Lecture Videos Audios
	Evaluation Method Continuous Evaluation ● Quiz ● Assignment / viva voce	Quiz Assignm ent Written Test

	• Written Test End-semester Assessment • Written Test	Written Test
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Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	C-15
2	Course Title	Accounting and Financial Statement Analysis
3	Programme	B.Sc Economics
4	Semesters	Semester:
5	Nature of the course	Major /Minor / Elective / Core / Compulsory / Elective
6	Credit	04
7	Level	U.G. / P.G
8	To be implemented from Academic Year	From the Academic Year: _____

Introduction Accounting is often regarded as the language of business, providing essential financial information necessary for decision-making, planning, and control. This course aims to introduce students to the fundamentals of accounting, financial statement preparation, and financial statement analysis. It will help students develop a strong conceptual understanding of accounting principles and their practical applications in the business environment.	
Rationale A solid foundation in accounting is crucial for understanding business operations, financial health, and compliance with regulatory frameworks. This course is designed to equip students with knowledge of accounting concepts, financial statement preparation, and financial analysis techniques. It will enable them to interpret financial data effectively and make informed financial decisions.	
Learner's Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able to.....	
CO1	To introduce students to fundamental accounting principles, concepts, and conventions.

CO2	To provide hands-on experience in preparing financial statements as per IFRS and the Companies Act 2013.
CO3	To develop analytical skills for evaluating financial statements using various techniques.
CO4	To understand financial ratios and their application in business decision-making.
CO5	To analyze and compare financial reports of companies from different sectors.
Course Objectives Knowledge-Based Outcomes: • Understanding the key concepts, principles, and standards of accounting. • Gaining insights into financial statement preparation and compliance with IFRS and Companies Act 2013. • Learning financial statement analysis techniques, including ratio analysis and trend analysis. Skill-Based Outcomes: • Ability to prepare financial statements using journal and ledger entries. • Capability to apply financial analysis techniques to interpret financial data effectively. • Proficiency in using financial ratios for evaluating business performance. • Competence in reading and analyzing corporate financial reports. Value-Based Outcomes: • Ethical understanding of financial reporting and compliance. • Awareness of corporate governance and transparency in financial statements. • Development of a responsible approach to financial decision-making.	

Unit	Course Content	No of Lectures
I	Definition-Accounting, Business Accounting, Cost Accounting, Need for accounting, Branches of accounting, Basic terms of accounting, Difference between book keeping and accounting, accounting concepts and	15

	conventions, Rules of Accounting and its application, Accounting Principles and Accounting Standards, GAAP, Accounting Standards by ICMA, Concept of IFRS, Difference between GAAP and IFRS.	
II	Journal Transactions, Ledger Transactions, Trial Balance, Income and expenditure statements, Cash Flow Statements. Balance Sheet, Double entry accounting system, Common form of balance sheet, Presentation of the Balance sheet according to IFRS, Preparation of Balance sheet according to Companies Act 2013, Off balance sheet items.	15
III	Objective of Financial Statement Analysis, Techniques to analysis- Horizontal analysis and vertical analysis. Income and Expenditure Statement-Revenue recognition, Income recognition, COGS, Gross Profit, Depreciation, Amortization, Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA), EBIT, Link between income and expenditure statement and Balance sheet. Cash Flow statements- Cash Flow from Operations, Cash flow from financing and investing activities, Link between Cash Flow statement and Balance sheet. Funds flow statements	15
IV	Ratio analysis- Liquidity ratios, Working capital efficiency ratios, Profitability ratios, Solvency ratios, Activity Turnover ratios, Equity Analysis- The dividend discount model, The price to earnings ratio, du point analysis. Trend analysis Studying the annual reports of companies in different sectors in detail along with notes to consolidated statements. Analysing and comparing the Financial Statements in detail of various companies.	15
	MODULE WISE SUGGESTED READINGS (APA Style)	
	1. Anthony, R.N., Hawkins, D.F., & Merchant, K.A. (2017). <i>Accounting: Text and Cases</i>. McGraw Hill. 2. Narayanaswamy, R. (2021). <i>Financial Accounting: A Managerial Perspective</i>. PHI Learning. 3. ICAI Publications on Accounting Standards. 4. Companies Act, 2013 – Ministry of Corporate Affairs, India. 5. IFRS Standards – International Accounting Standards Board (IASB).	
	1. Khan, M.Y., & Jain, P.K. (2020). <i>Management Accounting: Text, Problems and Cases</i>. McGraw Hill.	

	- Revsine, L., Collins, D.W., & Johnson, W.B. (2018). <i>Financial Reporting and Analysis</i>. Pearson. - Gupta, R.L., & Radhaswamy, M. (2022). <i>Advanced Accountancy</i>. Sultan Chand & Sons. - Damodaran, A. (2012). <i>Investment Valuation: Tools and Techniques for Determining the Value of Any Asset</i>. Wiley. - Annual Reports of Listed Companies for Practical Analysis.	
	Teaching Pedagogy - Lecture - Group Discussion - Videos - Case study - Data Analysis	
	Evaluation Method Continuous Evaluation - Quiz - Assignment / viva voce - Written Test End-semester Assessment - Written Test	

Introduction Financial decision-making is at the core of business and economic activities. Understanding fundamental financial concepts, risk-return trade-offs, and valuation principles is essential for students pursuing careers in finance, accounting, and business management. This course provides a strong foundation in financial theory, equipping students with the necessary tools to analyze financial statements, assess risk, and understand the bond market dynamics.	
Rationale Finance is a crucial discipline that influences corporate strategies, investment decisions, and economic stability. This course is designed to introduce students to fundamental financial principles, including the time value of money, financial statement analysis, and risk management. By learning these concepts, students will develop critical analytical skills that will aid them in making informed financial decisions and understanding market behavior. The course also prepares students for more advanced financial studies by providing a comprehensive overview of essential financial methodologies.	
Learner's Learning Outcomes/Course Outcomes: At the end of this course, the learner will be able to.....	
CO1	Define fundamental financial concepts such as money, finance, financial systems, and financial intermediaries.
CO2	Explain the significance of the time value of money and its applications in financial decision-making.
CO3	Calculate future and present values of cash flows, annuities, and loan amortization schedules using appropriate financial formulas.

CO4	Interpret financial statements using ratio analysis to assess liquidity, profitability, and leverage.
CO5	Assess the relationship between risk and return, and differentiate between systematic and unsystematic risk.
CO6	Develop investment strategies by analyzing bond yields, interest rate fluctuations, and risk diversification techniques.

Syllabus for Revision/Approval	BoS meeting held on:	AC meeting held on :
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1	Course Code	C-03
2	Course Title	Basic Financial Methods
3	Programme	B. Sc Economics
4	Semesters	Semester: 1
5	Nature of the course	Major /Minor / Elective / Core / Compulsory / Elective
6	Credit	04
7	Level	U.G.
8	To be implemented from Academic Year	

Course Objectives:

Knowledge-Based:

- Understand the core concepts of finance, including money, financial systems, and financial intermediaries.
- Learn the principles of financial statement analysis and ratio analysis.
- Comprehend the significance of time value of money and its applications in various financial decisions.
- Gain insights into risk-return relationships and different types of financial risks.
- Understand the functioning of bond markets, interest rates, and yield calculations.

Skill-Based:

- Analyze and interpret financial statements to assess corporate performance.
- Apply time value of money concepts to evaluate investment opportunities.
- Calculate financial ratios to assess liquidity, leverage, and profitability.
- Assess and quantify financial risk using statistical measures like variance and standard deviation.
- Evaluate bond pricing, yield to maturity, and duration for effective investment decisions.

Value-Based:

- Develop ethical financial decision-making skills by understanding the implications of financial actions on stakeholders.
- Foster financial responsibility and integrity in personal and professional financial dealings.
- Promote sustainable financial practices that align with social and environmental well-being.
- Encourage critical thinking about financial fairness, transparency, and accountability.
- Cultivate a long-term perspective on financial management to ensure economic stability and growth.

Unit	Course Content	No of Lectures
I	Module I: The Building Blocks of Financial Theory What is Money? What is Finance? Difference Between Stock and Flow (Income, Wealth, Black Money, Investment) Monetary Assets Vs Financial Assets Financial Intermediaries Financial Systems Interface of Financial Management with Other Functional Areas Basic Financial Statement Analysis: Balance Sheet Analysis, P&L Account Ratio Analysis: Liquidity, Leverage, Turnover and Profitability Ratios	15
II	Module II: Time, Money and Value Time Value of Money: Why the Time Value of Money Simple Interest and Compounded Interest Nominal and Real Rates of Interest Future Value: Single Cash Flow, Multiple Cash Flows and Annuity Present Value: Single Cash Flow, Multiple Cash Flows and Annuity Growing Annuity Perpetuity and Growing Perpetuity Loan Amortization	15
III	Module III: Risk, Return and Finance Risk and Return: Concepts Relationship Between Risk and Return Risk Diversification Systematic and Unsystematic Risk Measuring the Risk: Variance and Standard Deviation	15
IV	Module IV: Understanding the Bond Market Financial Securities- Bonds and Equities: Features, Types Interest Rates and Yields Current Yield Yield to Maturity Duration	15
	MODULE WISE SUGGESTED READINGS (APA Style)	
I	Essential Readings: ○ Brealey, R., Myers, S., & Allen, F. (2020). <i>Principles of Corporate Finance</i> (13th ed.). McGraw-Hill. ○ Bodie, Z., Kane, A., & Marcus, A. J. (2021). <i>Investments</i> (12th ed.). McGraw-Hill. Additional Readings: ○ Mishkin, F. S. (2019). <i>The Economics of Money, Banking, and Financial Markets</i> (12th ed.). Pearson.	

	○ Fabozzi, F. J. (2018). <i>Foundations of Financial Markets and Institutions</i> (5th ed.). Pearson.	
II	Essential Readings: ○ Ross, S. A., Westerfield, R. W., & Jaffe, J. (2021). <i>Corporate Finance</i> (13th ed.). McGraw-Hill. ○ Van Horne, J. C., & Wachowicz, J. M. (2018). <i>Fundamentals of Financial Management</i> (14th ed.). Pearson. Additional Readings: ○ Damodaran, A. (2012). <i>Investment Valuation: Tools and Techniques for Determining the Value of Any Asset</i> (3rd ed.). Wiley. ○ Levy, H., & Post, T. (2005). <i>Investments</i> (2nd ed.). Pearson.	
III	Essential Readings: ○ Sharpe, W. F., Alexander, G. J., & Bailey, J. V. (1999). <i>Investments</i> (6th ed.). Prentice Hall. ○ Elton, E. J., Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2020). <i>Modern Portfolio Theory and Investment Analysis</i> (10th ed.). Wiley. Additional Readings: ○ Markowitz, H. (1952). <i>Portfolio Selection</i>. The Journal of Finance, 7(1), 77-91. ○ Fama, E. F., & French, K. R. (1993). <i>Common Risk Factors in the Returns on Stocks and Bonds</i>. Journal of Financial Economics, 33(1), 3-56.	
IV	Essential Readings: ○ Fabozzi, F. J. (2021). <i>Bond Markets, Analysis, and Strategies</i> (10th ed.). Pearson. ○ Tuckman, B., & Serrat, A. (2011). <i>Fixed Income Securities: Tools for Today's Markets</i> (3rd ed.). Wiley. Additional Readings: ○ Hull, J. C. (2018). <i>Options, Futures, and Other Derivatives</i> (10th ed.). Pearson.	

	○ Choudhry, M. (2010). <i>The Bond and Money Markets: Strategy, Trading, Analysis</i>. Butterworth-Heinemann.	
	Teaching Pedagogy ● Lecture ● Group Discussion ● Videos ● Case study ● Data Analysis	
	Evaluation Method Continuous Evaluation ● Quiz ● Assignment / viva voce ● Written Test End-semester Assessment ● Written Test	

