BENGALURU CITY UNIVERSITY

CHOICE-BASED CREDIT SYSTEM

(As per SEP)

Syllabus for B.A & B.Sc. Economics

2025-2056

Dear Fellow Teachers,

Warm greetings to each of you.

As part of our ongoing commitment to nurturing well-rounded, employable, and socially responsible graduates, the Department of Economics is pleased to introduce a revitalized curriculum for the third and fourth semesters of the B.A. Economics programme. This new structure blends core theoretical knowledge with hands-on practical exposure, ensuring our students are both academically strong and workplace-ready.

Core Papers with Real-World Relevance

To strengthen foundational learning, we are introducing the following compulsory core courses:

Public Economics (Core Paper – Semester III)

This paper enables students to explore the crucial distinction between public and private goods, understand the causes and consequences of market failures (externalities, monopolies, etc.), and evaluate the role of government in correcting these failures through regulations, subsidies, and public provisioning. Core concepts like the Principle of Maximum Social Advantage, public revenue and expenditure, budgeting, and fiscal policy and deficit management are taught with practicum-based activities such as mock budgeting exercises, analysis of government expenditure patterns, and debates on tax reforms, giving students both conceptual clarity and practical exposure.

Development Economics (Core Paper – Semester IV)

This course empowers students to engage deeply with theories and indicators of development, including GDP per capita, Human Development Index (HDI), Physical Quality of Life Index (PQLI), and the Happiness Index. Students will critically examine poverty and inequality using tools like the Gini Coefficient, Human Poverty Index, and Multidimensional Poverty Index. The course also explores classical and contemporary theories of growth, strategies for sustainable and inclusive development, and the nexus between environment and development. Practicums include field-based surveys, data

analysis using real development indicators, and case studies on inclusive growth policies.

Elective Papers to Build the latest Skills

In addition, we are offering a set of skill-enhancing electives that respond to the changing economic landscape and employment demands:

- Economics of GST
- Artificial Intelligence and Machine Learning for Economics
- Entrepreneurial Economics
- Economics of Start-Up

These electives are designed to offer hands-on, application-driven learning in taxation, data science, innovation, and business strategy. Students will engage with practical tools, software environments, and real-world case studies, preparing them for a diverse range of careers—from policy analysis and business development to start-up incubation and data-driven economic research.

A Curriculum with Purpose

Our aim is to make economics relevant, relatable, and rooted in practice. Teachers will serve as mentors, guiding students through field work, simulations, practicums, and reflective assignments, fostering a spirit of inquiry and innovation. With this enriched curriculum, we believe our students will emerge not only with strong academic foundations but also with the confidence and skills to contribute meaningfully to society and the economy.

We look forward to shaping the next generation of economists who are analytical in thought, ethical in action, and entrepreneurial in spirit.

Warm regards,

S.R. Keshava

Acknowledgement

The Chairperson and all Members of the Board of Studies sincerely thank our Honorable Vice-Chancellor for reposing trust in us and allowing us to contribute meaningfully to curriculum development. We also extend our heartfelt thanks to the Registrar and other university officials for their constant support and for ensuring all necessary arrangements were in place, enabling us to carry out our responsibilities smoothly and effectively.

Chairperson & Members BCU
BOS-UG ECONOMICS

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Proceedings of the UG BOS Economics, BCU meeting held at the Department of EconomiesBUB on 17 June 2025

Members Present

Dr. S.R. Keshava, Chairperson

Dr S. Shyamala Devi, Member

Dr. Anupama B Member

Ms. Tharamathi, Member

Dr. Shyamala, Member

Dr. Sudha B.V, Member

The UG Board of Studies in Economics convened its meeting with the Chairperson warmly welcoming all the members and initiating the proceedings by presenting the draft syllabus prepared for the 3rd and 4th semesters of the BA and B.Sc. Economics programmes.

Each paper included in the proposed syllabus for the 3rd and 4th semesters of the BA and B.Sc. Economics programme was presented in detail. The members actively participated in discussions, offering valuable suggestions and inputs. Based on the deliberations, appropriate corrections and modifications were incorporated to enhance the academic quality and relevance of the curriculum.

Following thorough discussions, the Board unanimously approved the revised syllabus for both BA and B.Sc. Economics for the 3rd and 4th semesters.

The meeting concluded with a formal vote of thanks, expressing gratitude to all members for their constructive contributions and collaborative spirit in shaping the academic roadmap for the upcoming semesters.

Signatures

Dr. S.R. Keshava

Dr .S.Shyamala Devi, Member

Dr. Anupama B Member

Ms. Tharamathi, Member

Dr. Shyamala, Member

Dr. Sudha B.V, Member

BA-Economics Curriculum and Credit Framework for the Undergraduate Programme with three core subjects without practicals (Say A, B & C) in all three years OR three subjects in the first 2 years and choose one of them as Major in the 3rd year.

Sem.	Subject 1 Economics (Credits) (L+T+P)	Subject 2 (Credits) (L+T+P)	Subject 3 (Credits) (L+T+P)	Electives	Languages (Credits) (L+T+P)	Skill/ Compulsory Courses (Credits) (L+T+P).	Sports/NCC /NSS/Range &Rovers (Scouts & Guides).	Total Credits
I	DSC-E1: Micro economics (5)	DSC-B1(5),	DSC-C1(5),		L1-1(3), L2-1(3)	**Skill-1**: Computer Applications (2) (1+0+2) / Environmental Studies (2)	Health, Wellness & Yoga (2) (1+0+2) (Optional)	26
II	DSC-E2: Macro Economics	DSC-B2(5),	DSC-C2(5),		L1-2(3), L2-2(3)	**Skill-2**: Environmental Studies (2)/ Computer Applications (2)	Sports/NCC/NSS/R&R(S&G)(2) (0+0+4) (2) (Optional)	26
III	DSC-E3: Public Economics	DSC-B3(5),	DSC-C3(5),	Economics of GST (2) or Artificial intelligence and machine learning for Economics(2)	L1-3(3), L2-3(3)	**Skill-3**: Communication & Translation Skills (2)(1+0+2)/ Constitution Values (2)		26
IV	DSC-E4: Development Economics	DSC-B4(5),	DSC-C4(5),	Entrepreneurial Economics (2) Or Economics of Start-Up (2)	L1-4(3), L2-4(3)	**Skill-4:** Constitution Values (2)/Communication &Translation Skills (2) (1+0+2)		26
V	DSC-E5: Basic Quantitative Techniques/International Economics	DSC-B5(5),	DSC-C5(5),		Elective E1 (2+1)	**Skill 5**: Job Skills (2) (1+0+2)		23
VI	DSC-E6:	DSC-B6(5)	DSC-C6(5)		Elective E2	**Skill 6**:		23
	Statistics for				(2+1)	Internship		

	Economics Agricultural Economics					(2) (0+0+4)		
	If candidates choose Economics as a major in the 3rd year and study that subject only, then the curriculum and credit Framework will be as follows:							
V	DSC-E7: Basic Quantitative Techniques DSC-E8: Agricultural Economics	DSE-1:(3) Economics of GST DSE-2(3)-Economics of Marketin g DSE-3(3) Economics and Law DS-E4: Rural Economics Res. Methodology (3)(2+0+2) (compulsory)		Skill 5: Job Skills (2) (1+0+2) Economics of tourism and Development Economics of dairy farming			23
VI	DSC-E9: Statistics for Economics DSC-E10: Indian Economics	DSE-E1 Economics of Insurance DSE-E2(2)-Economics of Marketing E4(3) Vocational-Digital Economics, Economics of dairy farming 1(3) (2+0+2)		Research Proposal formulation and Research Project (1*+ 4)			23
	Students who complete the 3-year UG program with 3-subjects in the first 2-years/4-semesters, and one of the three subjects as major in the 3rd year/ 5th & 6th Semesters will be awarded UG Degree in the major, with the other two subjects as minors.							

BA

Economics

3rd & 4th Semester

BENGALURE CITY UNIVERSITY

BENGALURU

Public Economics
DSC – E3

Program Name	**BA in Economics**	Semester	**Third Semester**
Course Title	**Public Economics**		
Course Code:	**ECO C3**	No. of Credits	**5**
Contact hours	**65 Hours**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Course Objectives:

- To introduce the fundamentals of public finance and government intervention
- To analyse public revenue and expenditure systems in depth
- To interpret fiscal policy tools and public budgets
- To evaluate deficit sustainability
- To enhance practical understanding through a field-based and data-driven project

Course Learning Outcomes (CLOs):

Students will be able to

- Explain public goods, Market failures and government intervention
- Assess tax structures, incidence and their economic effects
- Analyse public expenditure trends and policy priorities
- Interpret and evaluate public budgets and deficit measures
- Apply theoretical knowledge in real-world fiscal policy contexts

MODULES	DESCRIPTION	65 Hours
Module I	**Foundations of Public Economics (13 Hours)**	**13**
	Public Economics: Meaning, Scope and Importance, Public Finance Vs Private Finance: Conceptual Distinction; Public goodvs private good: Characteristics, examples and implications. Market Failures: causes, types (externalities, public goods, monopolies), Role of Government: Corrective actions – regulation, subsidies, public provision, principle of Maximum Social Advantage	11
Practicum	Field Observation: Identify one public and one private good in your locality Group debate: "Should education and healthcare be fully public?" Assignment: Market failure case analysis in the local context	02
Module II	**Public Revenue (13 Hours)**	**13**
	Sources of Public Revenue: Tax and non-tax sources. Canons of Taxation (Adam Smith and Modern Canons). Classification of Taxes: Direct vs. Indirect, Progressive vs. Regressive. Proportional, Tax Incidence Impact and Shifting, Taxation and Economic Efficiency Effects on production, Meaning, factors, and consumption and equity, Taxable Capacity estimation. Goods and Services Tax (GST) in India - Objectives, types. advantages & Tax rates	11

Practicum	Mini-Survey: GST compliance and Challenges faced by small traders Comparative analysis of direct vs indirect taxes from the Union Budget Assignment: Study and classify taxes levied by local bodies/municipalities	02
Module III	**Public Expenditure (13 Hours)**	**13**
	Meaning and Objectives of Public Expenditure. Classification Revenue vs Capital, Development vs Non-Development, Plan vs non-plan (historical). Canons and Principles of Public Expenditure, Causes for the Growth in Public Expenditure. Theories: Wagner's Law, Peacock-Wiseman Hypothesis. Effects of Public Expenditure on production, distribution, and welfare. Evaluation of Major Welfare Expenditures: Health, Education, Infrastructure	11
Practicum	Analyse trends in expenditure on education and health from the Union/State Budgets Field-based project Assessment of a Government welfare program (Eg, PMAY, MGNREGA, Sthri Shakthi) Assignment: Case study on allocation and efficiency/ inefficiency in public spending	02
Module IV	**Public Debt and Management (13 Hours)**	**13**
	Public Debt Definition, classification (internal/external, voluntary, compulsory). Purpose and Growth of Public Debt, Theories of Public Debt, Ricardian. Keynesian, and Post Keynesian, Burden of Debt, Intergenerational equity and sustainability, Debt Redemption Methods, Public Debt Management in India, Challenges and Strategies	**11**
Practicum:	Create a visual timeline of India's public debt evolution Assignment: Compare India's debt-to-GDP ratio with that of another emerging economy Group discussion: "Should India borrow more for infrastructure spending?	**2**
Module V	**Public Budget, Fiscal Policy and Deficit Management (13 Hours)**	**13**
Practicum:	Public Budget Concepts, components, and types (Revenue, Capital, Performance, Gender), Budgeting Process and Classification (Economic and Functional). Fiscal Deficit. Revenue Deficit, Primary Deficit Definitions and Calculations Fiscal Policy Objectives and tools (automatic stabilizers, discretionary tools). Deficit Financing: Meaning, methods, implications, Budget Transparency and Accountability. FRBM Act and Fiscal Consolidation	11
	Latest Union Budget and State Budget Analysis Workshop: Interpreting budget highlights and deficit measures Budget Stimulation Roleplay: Prepare and present a mini-budget in class Assignment: Analyse fiscal policy during a crisis (e.g. COVID-19 response budget) and the post-COVID period.	02

References	
1	Lekhi R.K., Joginder Singh (2018). Public Finance, Kalyani Publication, New Delhi
2	Tyagi B.P. (2014). Public Finance, published by Jaya Prakash Nath and Co., Meerut

3	Hindriks J and G. Myles (2006): Intermediate Public Economics, MIT Press.
4	Bhatia H L (2018): Public Finance. Vikas Publishing House.
5	Musgrave, R.A. (1989), The Theory of Public Finance, McGraw-Hill
6	Musgrave, R.A. and P.B. Musgrave (1989), Public Finance in Theory and Practice, McGraw-Hill,

Economics of GST
Elective-3.1

Program Name	**BA in Economics**	Semester	**Third Semester**
Course Title	**Economics of GST**		
Course Code:	**Elective-3.1**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 Hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives (COBs)

By the end of this course, students will be able to:

- Understand the evolution and structure of indirect taxation in India, with a specific focus on the shift to the Goods and Services Tax (GST) regime.
- Explore the legal, structural, and administrative aspects of GST, including registration, levy, valuation, and tax credit mechanisms.
- Analyse the economic impact of GST on businesses, consumers, and various sectors of the economy.
- Apply concepts and techniques for calculating GST and Input Tax Credit, including understanding the place, time, and value of supply.
- Develop a critical perspective on tax reforms, policy implementation, and federal cooperation through the GST framework.

Course Outcomes (COs)

After successful completion of the course, students will be able to:

- **CO1**: Describe the pre-GST indirect tax system and explain the rationale behind India's shift to GST.
- **CO2**: Explain the structure and components of the dual GST model (CGST, SGST, IGST, UTGST) and the constitutional framework.
- **CO3**: Identify and interpret key provisions of GST law, including taxable events, exemptions, and classification of supplies.
- **CO4**: Evaluate the role of the GST Council and administrative bodies in the implementation and governance of GST.
- **CO5**: Calculate GST liability, valuation of supply, and eligible Input Tax Credit through practical problems and illustrations.
- **CO6**: Analyse the broader economic implications of GST on production, distribution, and consumption patterns in the Indian economy.

Modules	Contents	30 Hrs
Module–1	**Introduction to Economics of GST**	**10**
	Overview of Indirect Taxes: Understanding the landscape of indirect taxation before the implementation of GST. GST: Definition, objectives, and the rationale behind introducing GST, Types of GST, GST Structure: Understanding the dual GST model in India, Constitutional Amendments: Key amendments related to GST	08
Practicum	Group Discussions on Indirect Taxes defects before GST Assignment on Types of Indirect Taxes before GST and After the Introduction of GST Group discussion: "Pros and cons of GST"	02
Module 2	**GST Law and Its Implementation**	**10**
	GST Council: Its role and functions., Registration under GST: Understanding the registration process and its implications, GST Rates and Exemptions, determining the time, place and value of Supply for GST calculation. Input Tax Credit (ITC), Eligibility for ITC: Conditions and restrictions on claiming ITC, Calculation of ITC, Supplier's declarations, GST Returns and the filing process, GST Payments	08
Practicum	Roleplay: Classroom simulation of a GST Council meeting to determine tax rates Numerical problems on: GST and ITC calculations, Valuation of supply and tax liability, Adjustment of ITC (CGST, SGST, IGST)	02
Module 3	**Impact of GST**	**10**
	Economic Effects: Impact of GST on various sectors (agriculture, manufacturing, services), Impact on Consumers: Changes in prices and consumer behaviour, Impact on Businesses: Changes in compliance requirements, costs, and competitiveness, Revenue Implications: Impact on government revenue and fiscal policy	08
Practicum	Sectoral Case Study Analysis: Divide students into small groups. Each group selects one sector (Agriculture, Manufacturing, Services) and prepares a case study exploring how GST has affected input costs, tax compliance, logistics, and pricing. A group presentation or report highlighting, Pre-GST tax structure vs the post-GST impact, Benefits and challenges faced in the sector, Policy suggestions, if any	02

References

1. Gupta, S. S. (2017). *GST: How to meet your obligations* (April ed.). Taxmann Publications.
2. Datey, V. S. (2019). *Indirect taxes: Law and practice*. New Delhi: Taxmann Publications.
3. Mehrotra, H. C., & Goyal, S. P. (2019). *Indirect taxes*. Agra: Sahitya Bhawan Publications

4.	Government of India. (2017). *The Central Goods and Services Tax Act, 2017*. New Delhi: Ministry of Law and Justice.
5.	Government of India. (2017). *The Integrated Goods and Services Tax Act, 2017*. New Delhi: Ministry of Law and Justice.
6.	Government of India. (2017). *The Union Territory Goods and Services Tax Act, 2017*. New Delhi: Ministry of Law and Justice.
7.	Government of India. (2017). *The Goods and Services Tax (Compensation to States) Act, 2017*. New Delhi: Ministry of Law and Justice.
8.	Government of India. (2016). *The Constitution (One Hundred and First Amendment) Act, 2016*. New Delhi: Government of India Gazette.
9.	Kelkar, V. (2004). *Report of the Task Force on Implementation of the Fiscal Responsibility and Budget Management Act, 2003*. Ministry of Finance, Government of India.

Artificial Intelligence and Machine Learning for Economics
Elective -3.2

Program Name	**BA in Economics**	Semester	**Third Semester**
Course Title	**Artificial intelligence and machine learning for Economics**		
Course Code:	**Elective-3.2**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives:

- Understand the fundamental concepts and evolution of Artificial Intelligence (AI) and Machine Learning (ML), and their significance in economic decision-making.
- Explore the applications of AI and ML in economics, such as economic forecasting, policy analysis, and market Behaviour modelling.
- Gain working knowledge of machine learning models and evaluation techniques with simplified examples relevant to economic datasets.
- Critically examine the ethical, legal, and policy issues associated with the use of AI and ML in the economic domain.
- Develop a responsible and inclusive perspective on how technology impacts economic systems, especially in the Indian context.

Course Outcomes

After successful completion of the course, students will be able to:

- **CO1:** Describe the evolution, scope, and terminology of AI and ML, particularly in relation to economics.
- **CO2:** Explain how AI and ML models are used in various economic sectors including public policy, markets, and development planning.
- **CO3:** Apply core machine learning concepts such as regression, classification, and dimensionality reduction to simplified economic problems.
- **CO4:** Interpret model performance using basic evaluation metrics like confusion matrix, precision, recall, and ROC curves.
- **CO5:** Analyze ethical challenges such as data privacy, algorithmic bias, and transparency in AI systems used for economic decision-making.
- **CO6:** Assess policy frameworks and recommend strategies for responsible and inclusive use of AI in economic governance.

MODULES	DESCRIPTION	30 Hours
Module I	**Foundations of Artificial Intelligence and Machine Learning in Economics**	**10**
	Understanding AI and ML- Definitions, core concepts, and goals of AI and ML, Distinction between AI, ML, and Data Science. Meaning: algorithms, models, datasets, predictions, learning types History and Evolution: Milestones in AI and ML development, From expert systems to neural networks: a simplified journey, Timeline of AI/ML adoption in economic research and forecasting	08
Practicum	**Debate**: "Will AI replace economists?" – explore automation vs human decision-making in economic planning. **Case Discussion**: Analyse a real-world example of ML being used in economic forecasting (e.g., predicting GDP, inflation, employment). Mini-**Research Task**: Students select a subfield (e.g., agriculture, labour, finance) and report on how AI/ML is transforming decision-making. **Classroom Activity**: AI in the news – students bring current examples from newspapers or policy reports and explain the economic relevance.	02
Module II	Economic Applications of AI and ML	**10**
	Role of AI/ML in economic modelling, Predictive Modelling in Economics, building models for forecasting inflation, unemployment, market analysis-demand estimation, policy impact simulations. AI in Behavioural economics, development economics, labour markets and financial markets, Use of econometric models alongside machine learning techniques Responsible AI for Inclusive Economic Development- Role of AI in reducing or reinforcing inequality, Digital divide and access to AI in rural and underserved communities, balancing innovation with social justice in economic planning	08
Practicum	Mini-project: Predict an economic indicator using real-world data **Mock Policy Drafting**: In teams, students draft a mini policy brief for "Responsible AI in Indian Economic Policy". Case study review: Analyse a published study using AI in economics Presentation on AI/ML implementation in public policy or markets	02
Module III	**Ethical, Legal, and Policy Dimensions of AI and ML in Economics**	**10**
	Data Privacy and Ownership- Concepts of data privacy, consent, and protection in economic datasets, Issues of surveillance, data monopolies, and misuse of economic data. Algorithmic Bias and Fairness- Understanding bias in training data and model outcomes, Economic implications of biased algorithms in credit scoring, hiring, pricing, etc., Strategies to reduce bias and ensure transparency in economic modelling Regulatory and Legal Frameworks, AI governance policies in India and globally, NITI Aayog's approach to Responsible AI, Global efforts (OECD, UNESCO, EU) for AI ethics and regulations	08

Practicum	Case Analysis: Review an example of algorithmic bias in economic services (e.g., loan rejections, job ads) and suggest mitigation strategies Debate: "Should AI-driven decisions be audited and explained to the public?" Roleplay: Simulate a public hearing with stakeholders (govt, tech firms, civil society) on the ethical use of AI in welfare schemes. Reflection Essay: Students write a short essay on: "How can AI help — or harm — inclusive economic growth in India	02

References	
1	Russell, S. J., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
2	Géron, A. (2019). *Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow: Concepts, tools, and techniques to build intelligent systems* (2nd ed.). O'Reilly Media
3	Mitchell, T. M. (1997). *Machine learning*. McGraw-Hill Education
4	Varian, H. R. (2014). *Big data: New tricks for econometrics*. *Journal of Economic Perspectives*, *28*(2), 3–28. https://doi.org/10.1257/jep.28.2.3
5	NITI Aayog. (2021). *Responsible AI for all: Part 1 - Principles for responsible AI*. Government of India. https://www.niti.gov.in/
6	OECD. (2019). *Recommendation of the Council on Artificial Intelligence*. OECD Legal Instruments. https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449 ➤ International policy guide on ethical and responsible use of AI.
7	Angwin, J., Larson, J., Mattu, S., & Kirchner, L. (2016). *Machine bias*. *ProPublica*. https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Development Economics
DSC – C4

Program Name	**BA in Economics**	Semester	**Fourth Semester**
Course Title	**Development Economics**		
Course Code:	**ECO C4**	No. of Credits	**5**
Contact hours	**65 Hours**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Course Objectives:

- To introduce students to the foundational concepts and distinctions between economic growth and economic development.
- To examine key development indicators and measurement tools used in assessing development progress.
- To familiarise students with classical, general, and partial theories of economic development
- To enable critical analysis of development patterns in developed and developing countries.
- To explore sectoral contributions (agriculture and industry) to the development process
- To build understanding of inclusive and sustainable development frameworks, including global goals (MDGS and SDGs)
- To develop students' ability to apply theoretical knowledge through practical assignments, data analysis, and real-world case studies.

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- **CO1:** Understand the basic concepts and measurements of Development.
- **CO2:** Learn some classical and partial theories of Development economics and identify the difference.
- **CO3:** Analyse differences between developed and developing economies through empirical data
- **CO4:** Critically evaluate sectoral contributions and strategies for sustainable and inclusive Development
- **CO5:** Apply learned concepts through hands-on activities. data analysis, and policy review relevant to India and other economies

MODULES	**DESCRIPTION**	**65 Hrs**
Module 1	**Introduction to Economic Development (13 Hours)**	**13**
	Concept and Definitions of Development and Growth. Economic Growth vs. Economic Development, Indicators of Development. GDP per capita, Human Development Index (HDI), Physical Quality of Life Index (PQLI), Happiness Index Poverty and Inequality: Concepts and Measures: Gini Coefficient. Human Poverty Index (HPI). Multidimensional Poverty Index (MPI)	11

Practicum:	Comparative analysis project using HDI and MPI data of selected countries Field survey or case study on local development indicators Create visual infographics of key development indices using Excel/Google Sheets	2
Module 2	**General Theories of Economic Growth and Development (13 Hours)**	**13**
	Adam Smith's Theory, David Ricardo's Theory, TR Malthus' Theory, Karl Marx s Theory: Schumpeter's Theory and Rostow's Growth Theory - Harrod-Domar Model.	11
Practicum:	Assignment comparing classical and modern development theories Group presentations on the relevance of each theory to contemporary India Debate "India in 2047 - A Developed Nation?"	2
Module 3	**Partial Theories and Strategies of Economic Development (13 Hours)**	**13**
	Lewis Dual Sector Model, Rodan's Big Push Theory, Leibenstein's Critical Minimum Effort Thesis, balanced vs. Unbalanced Growth, Factors in the Development Process Capital Formation, Capital-Output Ratio, Technological Change	11
Practicum:	Simulation game: Balanced vs. Unbalanced Growth Strategy Assignment India's push for capital accumulation & productivity growth Poster/infographic: Capital-output ratio and its implications on policy	2
Module 4	**Sectoral View of Development (13 Hours)**	**13**
	Agricultural Sector and Development- Role of Agriculture in Economic Development, Agricultural Production and Agricultural Productivity, Sustainable Agriculture. **Industrial Sector and Development**- Role of Industry in Economic Development, Industrialisation in Developing Economies: Patterns and Challenges, Appropriate Technology and Employment Generation- Micro, Small and Medium Enterprises (SMEs) Role, Constraints, and Policies, Startup. **Service Sector and Development-** Growing Importance of the Service Sector in Economic development, Service-led Growth: Opportunities and Limitations, Development Drivers-Tourism, Health, Education, IT, Financial Services.	11
Practicum:	Case study on rural transformation through agriculture Field visit to agri-tech initiatives/startups or cooperative societies Interview report: Local small-scale industrial unit challenges and opportunities. Data Analysis on Sectoral Trends (All Sectors)-Using data from sources like RBI NSSO or Economic Survey, analyse the changing contribution of agriculture, industry, and services to GDP and employment over the last 20 years.	2
Module 5	**Environment, Sustainable and Inclusive Development (13 Hours)**	**13**
	Environment-Economy Linkages, Environment as necessity and luxury, Impact of increasing population on environment, Trade-offs between economic growth and ecological sustainability, concepts of Inclusive Growth, Millennium Development Goals (MDGs)- Targets and Outcomes, Sustainable Development Goals (SDGs).	11

Practicum:	• Seminar presentations on India's SDG achievements (Goal-wise group work) • Policy brief writing on one key challenge in achieving sustainable • development • Environmental audit of the college campus or the local area	2

References	
1	Higgins Benjamin & W.W. Norton Economic Development New York & Company.Inc.
2	Mishra S.K and Puri V.K, Economic Development and Planning, Himalaya Pub., House, Mumbai.
3	Taneja M.L. and Meier G. M, Economics of Development and Planning, S. Chand and Co, Delhi.
4	Thirlwall A.P. Growth and Development: With Special Reference to Developing Economies, Palgrave Macmillan, New York.
5	Todoaro. M.P & Orient Longman Economic Development in the Third World, United Kingdom
6	Sustainable Development Reports

Entrepreneurial Economics
Elective 4.1

Program Name	**BA in Economics**	Semester	**Fourth Semester**
Course Title	**Entrepreneurial Economics**		
Course Code:	**Elective-4.1**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives:

- To introduce the fundamental concepts of entrepreneurship and the entrepreneurial mindset.
- To help students understand the role of entrepreneurship in economic development.
- To guide students through the process of identifying business opportunities and launching ventures.
- To provide insights into innovation, creativity, and legal protection of business ideas.
- To familiarize students with entrepreneurial support systems, funding options, and government schemes.

Course Outcomes

After successful completion of the course, students will be able to:

- **CO1**: Explain the concepts, types, and importance of entrepreneurship in economic growth.
- **CO2**: Identify viable business opportunities and design a basic business plan.
- **CO3**: Apply creative thinking and innovation tools in developing entrepreneurial ideas.
- **CO4**: Evaluate available support systems and funding mechanisms for starting a venture.
- **CO5**: Demonstrate entrepreneurial thinking through field-based practicums and project work.

MODULES	DESCRIPTION	30 Hours
Module I	**Entrepreneur and the Economy**	**10**
	Entrepreneurs: meaning, definitions, types and characteristics, functions; Difference between entrepreneur, manager, and intrapreneur; Role of entrepreneurship in economic development; Factors influencing entrepreneurship: psychological, social, economic, and environmental; Emerging trends: social, health, tourism, and women entrepreneurship; Barriers to entrepreneurship	08
Practicum	**Group Discussion:** "Entrepreneurs vs Managers" **Interview:** Talk to a local entrepreneur and prepare a short report on their journey **Poster Presentation:** Barriers faced by women or rural entrepreneurs	02
Module II	**Launching Entrepreneurial Ventures**	**10**

	Idea generation: sources, screening, and assessing opportunities, Business plan: structure and content, steps in setting up a business, Market survey, feasibility study, opportunity mapping, Role of innovation and creativity in entrepreneurship, Types and sources of innovation, Intellectual property: branding, trademarks, copyrights, patents, registered designs	08
Practicum	**Business Idea Pitch:** Students present a new venture idea in class **Fieldwork:** Conduct a small market survey for a local product/service **Simulation:** Create a sample business plan for a startup **Workshop:** Introduction to Intellectual Property Rights with case examples	02
Module III	**Entrepreneurial Ecosystem and Support Systems**	**10**
	Entrepreneurial assistance and support institutions, Industrial Parks and SEZs – meaning, features, and examples, Financial assistance: licensing, clearances, tax concessions, Debt vs equity financing; venture capital, angel investors, Government initiatives: Start-up India, MUDRA, Make in India, EDPs, Entrepreneurship Development Programmes – objectives, phases, and inputs	08
Practicum	**Case Study:** Analyse a government-supported startup (e.g., under Startup India) **Roleplay:** Simulate an EDP training session in class **Report Writing:** Industrial visit or virtual tour of an incubation centre **Quiz:** Government schemes for entrepreneurs	02

References	
1	Kuratko, D. F. (2014). *Entrepreneurship: Theory, process and practice* (9th ed.). Cengage Learning.
2	Khanka, S. S. (2013). *Entrepreneurial development*. New Delhi: S. Chand & Co. Ltd.
3	Kuratko, D. F., & Rao, T. V. (2012). *Entrepreneurship: A South Asian perspective*. Cengage Learning.
4	Saibaba, R. (2018). *Entrepreneurship*. New Delhi: Kalyani Publishers.
5	Sharma, S. (2017). *Entrepreneurship development and business ethics*. New Delhi: V.K. Global Pvt. Ltd.
6	Desai, V. (2018). *Dynamics of entrepreneurial development and management*. Mumbai: Himalaya Publishing House.
7	Plsek, P. E. (2000). *Creativity, innovation and quality: Tools for fostering innovation and quality in organisations* (Eastern Economic Edition). New Delhi: Prentice-Hall of India.

Economics of Start-Up
Elective 4.2

Program Name	**BA in Economics**	Semester	**Fourth Semester**
Course Title	**Economics of Start-Up**		
Course Code:	**Elective-4.2**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives:

- To introduce students to the economic foundations and dynamics of start-ups and entrepreneurship.
- To explore the start-up ecosystem, including funding mechanisms, institutional support, and market positioning.
- To equip students with the analytical and practical tools to evaluate financial, legal, and strategic aspects of launching and managing a start-up.
- To develop entrepreneurial mindsets and innovation-oriented thinking among students.
- To encourage students to apply economic principles in real-world start-up planning and feasibility assessment.

Course Outcomes:

After completing this course, students will be able to:

- **CO1**: Understand the evolution, structure, and economic significance of start-ups.
- **CO2**: Analyze financial requirements, funding options, and regulatory procedures relevant to start-ups.
- **CO3**: Apply tools such as feasibility analysis and process mapping in business planning.
- **CO4**: Evaluate strategies for scaling, managing growth, and addressing failure in entrepreneurial ventures.
- **CO5**: Design and present a viable business model based on ideation and innovation principles.
-

MODULES	**DESCRIPTION**	**30 Hours**
Module I	**Foundations of the Start-up Ecosystem**	**10**
	Understanding business start-ups and the rise of the start-up economy, Ideation and venture choices, Key pillars of start-up development and the start-up equation, Entrepreneurial ecosystem and institutions, Role of government initiatives: Start-up India, incubation centres, support hubs. Entrepreneurship trends in India and Bengaluru	08
Practicum	Case Study: Select a successful Indian start-up and map its growth using the start-up equation Idea Clustering: Group ideation workshop with feedback on viability and innovation Debate: "Do start-ups truly drive inclusive growth in India?"	02

Module II	**Start-up Finance and Legal Framework**	**10**
	Resource and capital needs for start-ups, Financial assumptions and process mapping, Positioning in the value chain and risk-reduction strategies, Funding types: equity, debt, bootstrapping, crowdfunding, alliances, Legal procedures: registration, taxation, compliance, approvals, Financial feasibility and funding for high-tech ventures	08
Practicum	**Simulated Budgeting**: Prepare a start-up's financial plan with capital assumptions **Roleplay**: Founders pitch to a mock investment panel (venture capitalist/angel investor) **Mini Research Task**: Compare funding models used by Indian vs global start-ups	02
Module III	**Start-up Growth, Exit, and Strategy**	**10**
	Stages of venture growth and life cycles, Scaling up: industry positioning and competitive edge, Venture life patterns and adaptation to change, Exit strategies: selling, merging, shutting down, Leadership succession planning, Dealing with business failure and bankruptcy	08
Practicum	**Workshop**: Build a growth and exit strategy for a hypothetical business **Panel Discussion**: Invite local entrepreneurs to discuss success, failure, and pivots **Reflective Essay**: Write on "What I learned from a failed start-up" using real-life examples	02

References

1.	Sahlman, W. A. (1997). How to write a great business plan. Harvard Business Review, 75(4), 98–108.
2.	Schilling, M. A. (2020). Strategic management of technological innovation (6th ed.). McGraw-Hill Education.
3.	Osterwalder, A., & Pigneur, Y. (2010). Business model generation: A handbook for visionaries, game changers, and challengers. Wiley.
4.	Government of India. (2020). Start-up India Action Plan. Department for Promotion of Industry and Internal Trade (DPIIT). https://www.startupindia.gov.in/
5.	Taneja, S. (2019). Start-up Ecosystem in India: The Role of Government. Journal of Entrepreneurship and Innovation, 8(1), 15–28.
6.	Gompers, P., & Lerner, J. (2004). The venture capital cycle (2nd ed.). MIT Press.
7.	Blank, S., & Dorf, B. (2020). The startup owner's manual: The step-by-step guide for building a great company (2nd ed.). Wiley.
8.	Ries, E. (2011). The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. Crown Publishing.
9.	Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2017). Entrepreneurship (10th ed.). McGraw-Hill Education
10.	Kuratko, D. F. (2014). Entrepreneurship: Theory, process and practice (9th ed.). Cengage Learning.

BSC

Economics

3rd & 4th Semester

BENGALURE CITY

UNIVERSITY

BENGALURU

BSC-Economics Curriculum and Credit Framework for the Undergraduate Programme with three core subjects without practical's (Say A, B & C) in all the three years OR three subjects in the first 2 years and choose one of them as Major in the 3rd year.

Sem.	Subject 1 (Credits) (L+T+P)	Electives	Languages (Credits) (L+T+P)	Skill/ Compulsory Courses (Credits) (L+T+P).	Sports/NCC /NSS/Range &Rovers (Scouts & Guides).	Total Credits
I	DSC-E1: Micro Economics		L1-1(3), L2-1(3)	**Skill- 1**: Computer Applications (2) (1+0+2) / Environmenal Studies (2)	Health, Wellness & Yoga (2) (1+0+2) (Optional)	26
II	DSC-E2: Macro Economics		L1-2(3), L2-2(3)	**Skill- 2**: Environmental Studies (2)/ Computer Applications (2)	Sports/NCC/NSS/R&R(S&G)(2) (0+0+4) (2) (Optional)	26
III	DSC-E3: Mathematical Economics (5)	Economics of GST (2) or Artificial intelligence and machine learning for Economics(2)	L1-3(3), L2-3(3)	**Skill-3**: Communication & Translation Skills (2)(1+0+2)/ Constitution Values (2)		26
IV	DSC-E4: Statistics for Economist (5)	Entrepreneurial Economics (2) Or Economics of Start-Up (2)	L1-4(5), L2- 4(5)	**Skill-4:** Constitution Values (2)/Commu		26

	s				-nication &Translation Skills (2) (1+0+2)	
Students exiting the program after successful completion of two years/ four semesters may be awarded UG Diploma in Science Disciplines.						
V	DSC-E5: Basic Econometrics		Elective E1 (2+1)	**Skill 5**: Job Skills (2) (1+0+2)		23
VI	DSC-E6: Indian Economics		Elective E2 (2+1)	**Skill 6**: Internship (2) (0+0+4)		23
Students who complete the 3-years UG program with all the three subjects in all the three years will be awarded UG Degree in Science						
If candidates choose one of the subjects as major in the 3rd year and studies that subject only, then the curriculum and credit Framework will be as follows:						
V	DSC-E7: Basic Econometrics DSC-E8: Public Economics	DSE-1:(3) Economics of GST DSE-2(3)- Economics of Marketing DSE-3(3) Economics and Law DSE-4(4): Rural Economics DSE-5(5): Res. Methodology (3) (2+0+2)	Skill 5: Job Skills (2) (1+0+2) Economics of tourism and Development Economics of dairy farming			23
VI	DSC-E9: Indian Economics DSC-E10: Development Economics	DSE-E1 Economics of Insurance DSE-E2(2)- Economics of Marketing E4(3) Vocational- Digital Economics, Economics of dairy farming 1(3) (2+0+2)	Research Proposal formulation and Research Project (1*+ 4)			23
Students who complete the 3-years UG program with 3-subjects in the first 2-years/4-semesters, and one of the three subjects as major in the 3rd year/ 5th & 6th Semesters will be awarded UG Degree in the major, with the other two subjects as minors.						

Mathematical Economics
DSC - C3

Program Name	**BSC in Economics**	Semester	**Third Semester**
Course Title	**Mathematical Economics**		
Course Code:	**ECO C3**	No. of Credits	**5**
Contact hours	**65 Hours**	Duration of SEA/Exam	**3 Hrs**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Course Objectives:

- **To introduce fundamental mathematical tools** such as sets, functions, and vectors, and develop the ability to apply them in formulating basic economic models.
- To familiarize students with essential **matrix operations and Cramer's Rule -**for addressing practical economic problems involving multiple variables.
- **To build analytical skills using calculus**—including limits, derivatives, and partial derivatives—for interpreting economic relationships such as marginal analysis, elasticity, and equilibrium behavior.
- **To develop proficiency in integration methods** for calculating economic quantities such as consumer surplus, producer surplus, and total cost/revenue from marginal functions.
- **To provide training in optimization techniques**, both unconstrained and constrained (using Lagrange multipliers), with applications to utility maximization, cost minimization, and profit maximization.

Course Outcome: On Successful completion of the course, the student will be able to;

1. Apply algebraic concepts to formulate and solve economic problems involving functions, sets, matrices, and vectors.
2. Utilize differentiation methods on various functions to examine and interpret the relationships among economic variables using calculus.
3. Employ optimization and integration methods to assess and solve economic problems.
4. **Interpret and analyze marginal concepts** such as marginal cost, marginal revenue, and marginal utility using partial derivatives and their applications in economic modeling.
5. **Use Cramer's Rule and matrix algebra** to solve linear economic systems, including input-output models and equilibrium analysis involving multiple markets or sectors.
6. **Demonstrate the ability to construct and evaluate economic models** using mathematical techniques, enhancing clarity and precision in economic reasoning.

MODULES	DESCRIPTION	65 Hours
Module I	**Introduction to Mathematical Economics (13 Hours)**	**13**

	Nature of Mathematical Economics and its applications in Economic Analysis -Mathematical Model: Variables, Constants, Parameters, Equations and Identities- Sets: Set notation, operations, finite and infinite sets, laws of set operations- Relations-Limits and Continuous functions of different types, their graphs- quadratic, polynomial, power, exponential, and logarithmic and its applications in economics -Simultaneous Equations- Vectors and vector spaces.	**11**
Practicum	Write examples of 2 finite and 2 infinite sets in real-life contexts. Group debate: "Most economic policies (e.g., tax rates, subsidies) are best modeled with continuous functions". Assignment: Solve using simple simultaneous equations both algebraically and graphically equilibrium price and quantity in a market using demand and supply equations.	**02**
Module II	**Matrices (13 Hours)**	**13**
	Matrix Operations- Addition and Subtraction, Matrix Multiplication, Commutative, Associative and Distributive laws-Transpose - Inverse Matrix - Determinants: Properties, Rank of Matrix, Minor, Co-factor - Cramer's Rule, Derivation and its Applications in Economics.	**11**
Practicum	Prove: For a Consumer Demand and Supply Model for two commodities, Verify if S+D=D+S. Discussion: Transposing a Matrix helps a Company Understand Changes in Demand Over Different Periods. Assignment: Study and classify Economic Applications of Matrices and Cramer's Rule	**02**
Module III	**Differential Calculus (13 Hours)**	**13**
	Differentiation – Rules of differentiation – Economic application of derivatives – Maxima and Minima of functions of one and two variables – Differential Equations- First Order Linear Differential Equations- Nonlinear First Order Differential Equations- Second Order Linear Differential Equations- Application in economics.	**11**
Practicum	Master derivative rules and apply them to economic functions like demand, revenue, and cost. Apply multivariable calculus and differential equations to solve optimization problems in economics. Illustrate a simple economic scenario that can be described by a first order differential equation.	**02**
Module IV	**Integral Calculus (13 Hours)**	**13**
	Concept of Integration -Rules of Integration and fundamental theorems – indefinite and definite integrals- application of integration – consumer's surplus; producer's surplus; investment and capital formation.	**11**
Practicum:	Outline the basic integration rules and illustrate them with examples. Describe a real-life scenario where a definite integral would be applied. Assignment: Explain how integration helps in deriving the total cost when marginal cost data is available.	**02**
Module V	**Optimization Techniques (13 Hours)**	**13**
	Concept of optimization - Unconstrained Optimization - Lagrangian Multiplier, Constrained Optimization. Applications – Utility Maximization , Cost Minimization, Output Maximization	**11**

Practicum:	Identify real-world scenarios where people or organizations try to maximize benefits or minimize costs? Group discussion: "Lagrange multiplier helps solve optimization problems with constraints efficiently". Apply optimization techniques in solving economic problems such as utility maximization, cost minimization, and profit optimization.	**02**

References	
1	Allen R.G.D., (2015) Mathematical Analysis for Economists, Macmillan.
2	Chiang, A. C. and Wainwright, K., "Fundamental Methods of Mathematical Economics", McGraw-Hill/Irwin, 4th Edition, 2005.
3	Bose D., (2003) An Introduction of Mathematical Economics, Himalaya Publishing House, Mumbai.
4	Sydsaeter, K and Hammond, P., Mathematics for Economic Analysis, Pearson Educational Asia, 4th Edition, 2002.
5	Dowling, E. T., "Introduction to Mathematical Economics", McGraw-Hill, 2001.
6	Hoy, M., Livernois, J. McKenna, C, Rees, R. and Stengos, T., "Mathematics for Economics", MIT Press, 3rd Edition, 2011
7	Yamane Taro, (2002**)** Mathematics for Economists - An Implementer Analysis, Phi Learning Publishers.

Economics of GST
Elective-3.1

Program Name	**BSC in Economics**	Semester	**Third Semester**
Course Title	**Economics of GST**		
Course Code:	**Elective-3.1**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 Hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives (COBs)

By the end of this course, students will be able to:

- Understand the evolution and structure of indirect taxation in India, with a specific focus on the shift to the Goods and Services Tax (GST) regime.
- Explore the legal, structural, and administrative aspects of GST, including registration, levy, valuation, and tax credit mechanisms.
- Analyse the economic impact of GST on businesses, consumers, and various sectors of the economy.
- Apply concepts and techniques for calculating GST and Input Tax Credit, including understanding the place, time, and value of supply.
- Develop a critical perspective on tax reforms, policy implementation, and federal cooperation through the GST framework.

Course Outcomes (COs)

After successful completion of the course, students will be able to:

- **CO1**: Describe the pre-GST indirect tax system and explain the rationale behind India's shift to GST.
- **CO2**: Explain the structure and components of the dual GST model (CGST, SGST, IGST, UTGST) and the constitutional framework.
- **CO3**: Identify and interpret key provisions of GST law, including taxable events, exemptions, and classification of supplies.
- **CO4**: Evaluate the role of the GST Council and administrative bodies in the implementation and governance of GST.
- **CO5**: Calculate GST liability, valuation of supply, and eligible Input Tax Credit through practical problems and illustrations.
- **CO6**: Analyse the broader economic implications of GST on production, distribution, and consumption patterns in the Indian economy.

Modules	Contents	30 Hrs
Module–1	**Introduction to the Economics of GST**	**10**
	Overview of Indirect Taxes: Understanding the landscape of indirect taxation before the implementation of GST. GST: Definition, objectives, and the rationale behind introducing GST, Types of GST, GST Structure: Understanding the dual GST model in India, Constitutional Amendments: Key amendments related to GST	08
Practicum	Group Discussions on Indirect Taxes defects before GST Assignment on Types of Indirect Taxes before GST and After the Introduction of GST Group discussion: "Pros and cons of GST"	02
Module 2	**GST Law and Its Implementation**	**10**
	GST Council: Its role and functions., Registration under GST: Understanding the registration process and its implications, GST Rates and Exemptions, determining the time, place and value of Supply for GST calculation. Input Tax Credit (ITC), Eligibility for ITC: Conditions and restrictions on claiming ITC, Calculation of ITC, Supplier's declarations, GST Returns and the filing process, GST Payments	08
Practicum	Roleplay: Classroom simulation of a GST Council meeting to determine tax rates Numerical problems on: GST and ITC calculations, Valuation of supply and tax liability, Adjustment of ITC (CGST, SGST, IGST)	02
Module 3	**Impact of GST**	**10**
	Economic Effects: Impact of GST on various sectors (agriculture, manufacturing, services), Impact on Consumers: Changes in prices and consumer behaviour, Impact on Businesses: Changes in compliance requirements, costs, and competitiveness, Revenue Implications: Impact on government revenue and fiscal policy	08
Practicum	Sectoral Case Study Analysis: Divide students into small groups. Each group selects one sector (Agriculture, Manufacturing, Services) and prepares a case study exploring how GST has affected input costs, tax compliance, logistics, and pricing. A group presentation or report highlighting, Pre-GST tax structure vs the post-GST impact, Benefits and challenges faced in the sector, Policy suggestions, if any	02

References

10. Gupta, S. S. (2017). *GST: How to meet your obligations* (April ed.). Taxmann Publications.

11. Datey, V. S. (2019). *Indirect taxes: Law and practice*. New Delhi: Taxmann Publications.

12. Mehrotra, H. C., & Goyal, S. P. (2019). *Indirect taxes*. Agra: Sahitya Bhawan Publications

13. Government of India. (2017). *The Central Goods and Services Tax Act, 2017*. New Delhi: Ministry of Law and Justice.

14. Government of India. (2017). *The Integrated Goods and Services Tax Act, 2017*. New Delhi: Ministry of Law and Justice.
15. Government of India. (2017). *The Union Territory Goods and Services Tax Act, 2017*. New Delhi: Ministry of Law and Justice.
16. Government of India. (2017). *The Goods and Services Tax (Compensation to States) Act, 2017*. New Delhi: Ministry of Law and Justice.
17. Government of India. (2016). *The Constitution (One Hundred and First Amendment) Act, 2016*. New Delhi: Government of India Gazette.
18. Kelkar, V. (2004). *Report of the Task Force on Implementation of the Fiscal Responsibility and Budget Management Act, 2003*. Ministry of Finance, Government of India.

Artificial intelligence and machine learning for Economics
Elective -3.2

Program Name	**BSC in Economics**	Semester	**Third Semester**
Course Title	**Artificial intelligence and machine learning for Economics**		
Course Code:	**Elective-3.2**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives:

- Understand the fundamental concepts and evolution of Artificial Intelligence (AI) and Machine Learning (ML), and their significance in economic decision-making.
- Explore the applications of AI and ML in economics, such as economic forecasting, policy analysis, and market Behaviour modelling.
- Gain working knowledge of machine learning models and evaluation techniques with simplified examples relevant to economic datasets.
- Critically examine the ethical, legal, and policy issues associated with the use of AI and ML in the economic domain.
- Develop a responsible and inclusive perspective on how technology impacts economic systems, especially in the Indian context.

Course Outcomes

After successful completion of the course, students will be able to:

- **CO1:** Describe the evolution, scope, and terminology of AI and ML, particularly in relation to economics.
- **CO2:** Explain how AI and ML models are used in various economic sectors including public policy, markets, and development planning.
- **CO3:** Apply core machine learning concepts such as regression, classification, and dimensionality reduction to simplified economic problems.
- **CO4:** Interpret model performance using basic evaluation metrics like confusion matrix, precision, recall, and ROC curves.
- **CO5:** Analyze ethical challenges such as data privacy, algorithmic bias, and transparency in AI systems used for economic decision-making.
- **CO6:** Assess policy frameworks and recommend strategies for responsible and inclusive use of AI in economic governance.

MODULES	DESCRIPTION	30 Hours
Module I	**Foundations of Artificial Intelligence and Machine Learning in Economics**	**10**
	Understanding AI and ML- Definitions, core concepts, and goals of AI and ML, Distinction between AI, ML, and Data Science. Meaning: algorithms, models, datasets, predictions, learning types History and Evolution: Milestones in AI and ML development, From expert systems to neural networks: a simplified journey, Timeline of AI/ML adoption in economic research and forecasting	08
Practicum	**Debate**: "Will AI replace economists?" – explore automation vs human decision-making in economic planning. **Case Discussion**: Analyse a real-world example of ML being used in economic forecasting (e.g., predicting GDP, inflation, employment). Mini-**Research Task**: Students select a subfield (e.g., agriculture, labour, finance) and report on how AI/ML is transforming decision-making. **Classroom Activity**: AI in the news – students bring current examples from newspapers or policy reports and explain the economic relevance.	02
Module II	**Economic Applications of AI and ML**	**10**
	Role of AI/ML in economic modelling, Predictive Modelling in Economics, building models for forecasting inflation, unemployment, market analysis-demand estimation, policy impact simulations. AI in Behavioural economics, development economics, labour markets and financial markets, Use of econometric models alongside machine learning techniques Responsible AI for Inclusive Economic Development- Role of AI in reducing or reinforcing inequality, Digital divide and access to AI in rural and underserved communities, balancing innovation with social justice in economic planning	08
Practicum	Mini-project: Predict an economic indicator using real-world data **Mock Policy Drafting**: In teams, students draft a mini policy brief for "Responsible AI in Indian Economic Policy". Case study review: Analyse a published study using AI in economics Presentation on AI/ML implementation in public policy or markets	02
Module III	**Ethical, Legal, and Policy Dimensions of AI and ML in Economics**	**10**
	Data Privacy and Ownership- Concepts of data privacy, consent, and protection in economic datasets, Issues of surveillance, data monopolies, and misuse of economic data. Algorithmic Bias and Fairness- Understanding bias in training data and model outcomes, Economic implications of biased algorithms in credit scoring, hiring, pricing, etc., Strategies to reduce bias and ensure transparency in economic modelling Regulatory and Legal Frameworks, AI governance policies in India and globally, NITI Aayog's approach to Responsible AI, Global efforts (OECD, UNESCO, EU) for AI ethics and regulations	08

Practicum	Case Analysis: Review an example of algorithmic bias in economic services (e.g., loan rejections, job ads) and suggest mitigation strategies Debate: "Should AI-driven decisions be audited and explained to the public?" Roleplay: Simulate a public hearing with stakeholders (govt, tech firms, civil society) on the ethical use of AI in welfare schemes. Reflection Essay: Students write a short essay on: "How can AI help — or harm — inclusive economic growth in India	02

References	
1	Russell, S. J., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
2	Géron, A. (2019). *Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow: Concepts, tools, and techniques to build intelligent systems* (2nd ed.). O'Reilly Media
3	Mitchell, T. M. (1997). *Machine learning*. McGraw-Hill Education
4	Varian, H. R. (2014). *Big data: New tricks for econometrics*. *Journal of Economic Perspectives, 28*(2), 3–28. https://doi.org/10.1257/jep.28.2.3
5	NITI Aayog. (2021). *Responsible AI for all: Part 1 - Principles for responsible AI*. Government of India. https://www.niti.gov.in/
6	OECD. (2019). *Recommendation of the Council on Artificial Intelligence*. OECD Legal Instruments. https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449 International policy guide on ethical and responsible use of AI.
7	Angwin, J., Larson, J., Mattu, S., & Kirchner, L. (2016). *Machine bias*. *ProPublica*. https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Statistics for Economists
DSC C4

Program Name	**BSC in Economics**	Semester	**Fourth Semester**
Course Title	**Statistics for Economists**		
Course Code:	**ECO C4**	No. of Credits	**5**
Contact hours	**65 Hours**	Duration of SEA/Exam	**3 Hrs**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Course Objectives:

1. **To introduce the foundational concepts of statistics** and explain their importance in analysing and interpreting economic data.
2. **To enable students to analyze relationships between economic variables** through statistical tools like correlation and regression, and to interpret trends using time series techniques.
3. **To provide an understanding of index numbers** and their applications in measuring inflation, cost of living, and changes in economic activity over time.
4. **To build a strong foundation in probability theory** to model economic uncertainty using classical, statistical, and axiomatic approaches.
5. **To introduce commonly used probability distributions** (binomial, Poisson, normal, etc.) and their economic relevance.
6. **To equip students with the knowledge of hypothesis testing methods** for making inferences and informed decisions based on sample data.

Course Outcome:

On Successful completion of the course, the student will be able to;

1. Employ basic statistical methods to organize and analyze economic data through averages, variability, and charts.
2. Examine economic data using correlation, regression, time series, and index numbers.
3. Apply probability and hypothesis testing to assess uncertainty and support decision-making in economics.
4. **Interpret and communicate statistical findings** in the context of real-world economic issues, supporting data-driven decision-making and policy evaluation.
5. **Use statistical software or tools** (e.g., Excel, R, SPSS, or Stata) to manage datasets, perform analyses, and generate meaningful visualizations for economic data.
6. **Construct and evaluate econometric models** to test economic theories and quantify relationships between economic variables.

MODULES	DESCRIPTION	65 Hrs
Module I	**Foundations of Statistical Methods in Economics (13 Hours)**	**13**
	Why Study Statistics - Importance of Statistics in Economics- Descriptive and Inferential Statistics -Data - Attributes, Variables, and Observations, Scales of Measurement - Qualitative and Quantitative Data - Cross-Sectional and Time Series Data. Data Sources and Collection Methods: primary and secondary data - Frequency Distribution and Cumulative Frequency distribution- Presentation: tabular and graphical, including histogram	**11**
Practicum	Describe a case in which statistics played a key role in resolving an economic challenge. Discuss the scenarios is which cross-sectional data more suitable for economic analysis than time series data. Collect primary data from your locality on topic of your choice, create a frequency and cumulative frequency table, and present it using a histogram and an ogive."	**02**
Module II	**Measures of Central Tendency and Dispersion (13 Hours)**	**13**
	Arithmetic mean, median, mode, Geometric mean and Harmonic mean measurement and applications in Economics. Meaning and significance of measure of dispersion -Measurement and applications of Range, quartile deviation, mean deviation, standard deviation, variance and coefficient of variation- Meaning	**11**
Practicum	Compute and interpret different measures of central tendency and apply them to real-world economic data. Provide an example where the mode offers better insight than the mean or median. If two countries have identical average incomes but different levels of dispersion, what can we infer about their economic inequality?	**02**
Module III	**Correlation and Regression (13 Hours)**	**13**
	Correlation: Meaning and types of correlation, methods of computation of correlation coefficient –Karl Pearson's method, Spearman's rank correlation method- R**egression**–meaning and importance of regression analysis, simple regression lines and equations and forecasting (two variables only)	**11**
Practicum	How would you measure the relationship between advertising expenses and sales using correlation? If you find a strong regression relationship between education level and income, how could this information be useful? Correlation and regression complement each other to enhance the analysis of economic data.	**02**
Module IV	**Index Numbers and Time Series (13 Hours)**	**13**
	Nature and Purpose of Index Numbers - Types of Index Numbers: Price Index - Quantity Index, Link and Chain Index - Simple and Aggregate Index Numbers -Laspyre's Index, Paasche's Index, Marshall and Edgeworth's	**11**

	Index - Fisher's Index – Time- Reversal and Factor Reversal Tests-Deflation and Splicing of Index Numbers - Problems in the Construction of Index Numbers - Limitation of Index Numbers **Time Series**: Nature and Components of Time Series	
	How can governments use index numbers for policy decisions, such as wage adjustments or subsidies? Discuss: "Recognising seasonal patterns in time series data supports decision-making for businesses and policymakers". Construct and analyse various price and quantity index numbers used in economic analysis.	**02**
Module V	**Probability and Probability Distribution (13 Hours)**	**13**
	Concept of Random experiment – Trial, Sample space, Events, Algebra of Events – Definition of Probability – Classical, Statistical and Axiomatic – Properties of Probability – Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications – Baye's theorem - Simple Problems. Meaning of discrete and continuous random variables, probability distributions- Properties of Binomial, Poisson and Normal random variables.	**11**
Practicum:	Identify two independent events and two dependent events from everyday life. Give an example that shows the application of Bayes' Theorem in an economic context. Why do we need different probability distributions like Binomial, Poisson, and Normal? Discuss with real life examples.	**02**

Textbooks	
1	Gupta S P. (2024) *Statistical Methods,* S. Chand and Company, New Delhi
References	
1	Anderson, Sweeney & Williams, (2002) *Statistics for Business & Economics,* Thomson South-Western, Bangalore.
2	Daniel and Terrel: Business Statistics for Management and Economics; Hoaghton Mifflin Co., Boston, Toronts, 7th Edition, 1995, PP 1 to 972 + 6 Appendices
3	Medhi, J., Statistical Methods: An Introductory Text, Wiley, 1992
4	Morris H. Degroot and Mark J. Schervish, "Probability and Statistics", 4th edition, 2012.
5	Teresa Bradley, Essential Statistics for Economics, Business and Management, John Willey Publisher, 2007

Entrepreneurial Economics
Elective 4.1

Program Name	**BSC in Economics**	Semester	**Fourth Semester**
Course Title	**Entrepreneurial Economics**		
Course Code:	**Elective-4.1**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Course Objectives:

- To introduce the fundamental concepts of entrepreneurship and the entrepreneurial mindset.
- To help students understand the role of entrepreneurship in economic development.
- To guide students through the process of identifying business opportunities and launching ventures.
- To provide insights into innovation, creativity, and legal protection of business ideas.
- To familiarize students with entrepreneurial support systems, funding options, and government schemes.

Course Outcomes

After successful completion of the course, students will be able to:

- **CO1**: Explain the concepts, types, and importance of entrepreneurship in economic growth.
- **CO2**: Identify viable business opportunities and design a basic business plan.
- **CO3**: Apply creative thinking and innovation tools in developing entrepreneurial ideas.
- **CO4**: Evaluate available support systems and funding mechanisms for starting a venture.
- **CO5**: Demonstrate entrepreneurial thinking through field-based practicums and project work.

MODULES	DESCRIPTION	30 Hours
Module I	**Entrepreneur and the Economy**	**10**
	Entrepreneurs: meaning, definitions, types and characteristics, functions; Difference between entrepreneur, manager, and intrapreneur; Role of entrepreneurship in economic development; Factors influencing entrepreneurship: psychological, social, economic, and environmental; Emerging trends: social, health, tourism, and women entrepreneurship; Barriers to entrepreneurship	08
Practicum	**Group Discussion:** "Entrepreneurs vs Managers" **Interview:** Talk to a local entrepreneur and prepare a short report on their journey **Poster Presentation:** Barriers faced by women or rural entrepreneurs	02
Module II	**Launching Entrepreneurial Ventures**	**10**

	Idea generation: sources, screening, and assessing opportunities, Business plan: structure and content, steps in setting up a business, Market survey, feasibility study, opportunity mapping, Role of innovation and creativity in entrepreneurship, Types and sources of innovation, Intellectual property: branding, trademarks, copyrights, patents, registered designs	08
Practicum	**Business Idea Pitch:** Students present a new venture idea in class **Fieldwork:** Conduct a small market survey for a local product/service **Simulation:** Create a sample business plan for a startup **Workshop:** Introduction to Intellectual Property Rights with case examples	02
Module III	**Entrepreneurial Ecosystem and Support Systems**	**10**
	Entrepreneurial assistance and support institutions, Industrial Parks and SEZs – meaning, features, and examples, Financial assistance: licensing, clearances, tax concessions, Debt vs equity financing; venture capital, angel investors, Government initiatives: Start-up India, MUDRA, Make in India, EDPs, Entrepreneurship Development Programmes – objectives, phases, and inputs	08
Practicum	**Case Study:** Analyse a government-supported startup (e.g., under Startup India) **Roleplay:** Simulate an EDP training session in class **Report Writing:** Industrial visit or virtual tour of an incubation centre **Quiz:** Government schemes for entrepreneurs	02

References	
1	Kuratko, D. F. (2014). *Entrepreneurship: Theory, process and practice* (9th ed.). Cengage Learning.
2	Khanka, S. S. (2013). *Entrepreneurial development*. New Delhi: S. Chand & Co. Ltd.
3	Kuratko, D. F., & Rao, T. V. (2012). *Entrepreneurship: A South Asian perspective*. Cengage Learning.
4	Saibaba, R. (2018). *Entrepreneurship*. New Delhi: Kalyani Publishers.
5	Sharma, S. (2017). *Entrepreneurship development and business ethics*. New Delhi: V.K. Global Pvt. Ltd.
6	Desai, V. (2018). *Dynamics of entrepreneurial development and management*. Mumbai: Himalaya Publishing House.
7	Plsek, P. E. (2000). *Creativity, innovation and quality: Tools for fostering innovation and quality in organisations* (Eastern Economic Edition). New Delhi: Prentice-Hall of India.

Economics of Start-Up

Program Name	**BSC in Economics**	Semester	**Fourth Semester**
Course Title	**Economics of Start-Up**		
Course Code:	**ECO Elective-2**	No. of Credits	**2**
Contact hours	**30**	Duration of SEA/Exam	**1.5 hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

Elective 4.2

Course Objectives:

- To introduce students to the economic foundations and dynamics of start-ups and entrepreneurship.
- To explore the start-up ecosystem, including funding mechanisms, institutional support, and market positioning.
- To equip students with the analytical and practical tools to evaluate financial, legal, and strategic aspects of launching and managing a start-up.
- To develop entrepreneurial mind-sets and innovation-oriented thinking among students.
- To encourage students to apply economic principles in real-world start-up planning and feasibility assessment.

Course Outcomes:

After completing this course, students will be able to:

- **CO1**: Understand the evolution, structure, and economic significance of start-ups.
- **CO2**: Analyze financial requirements, funding options, and regulatory procedures relevant to start-ups.
- **CO3**: Apply tools such as feasibility analysis and process mapping in business planning.
- **CO4**: Evaluate strategies for scaling, managing growth, and addressing failure in entrepreneurial ventures.
- **CO5**: Design and present a viable business model based on ideation and innovation principles.

MODULES	DESCRIPTION	30 Hours
Module I	**Foundations of the Start-up Ecosystem**	**10**
	Understanding business start-ups and the rise of the start-up economy, Ideation and venture choices, Key pillars of start-up development and the start-up equation, Entrepreneurial ecosystem and institutions, Role of government initiatives: Start-up India, incubation centres, support hubs, Entrepreneurship trends in India and Bengaluru	08
Practicum	Case Study: Select a successful Indian start-up and map its growth using the start-up equation Idea Clustering: Group ideation workshop with feedback on viability and innovation Debate: “Do start-ups truly drive inclusive growth in India?”	02

Module II	**Start-up Finance and Legal Framework**	**10**
	Resource and capital needs for start-ups, Financial assumptions and process mapping, Positioning in the value chain and risk-reduction strategies, Funding types: equity, debt, bootstrapping, crowdfunding, alliances, Legal procedures: registration, taxation, compliance, approvals, Financial feasibility and funding for high-tech ventures	08
Practicum	**Simulated Budgeting**: Prepare a start-up's financial plan with capital assumptions **Roleplay:** Founders pitch to a mock investment panel (venture capitalist/angel investor) **Mini Research Task:** Compare funding models used by Indian vs global start-ups	02
Module III	**Start-up Growth, Exit, and Strategy**	**10**
	Stages of venture growth and life cycles, Scaling up: industry positioning and competitive edge, Venture life patterns and adaptation to change, Exit strategies: selling, merging, shutting down, Leadership succession planning, Dealing with business failure and bankruptcy	08
Practicum	**Workshop:** Build a growth and exit strategy for a hypothetical business **Panel Discussion:** Invite local entrepreneurs to discuss success, failure, and pivots **Reflective Essay:** Write on "What I learned from a failed start-up" using real-life examples	02

References

11.	Sahlman, W. A. (1997). How to write a great business plan. Harvard Business Review, 75(4), 98–108.
12.	Schilling, M. A. (2020). Strategic management of technological innovation (6th ed.). McGraw-Hill Education.
13.	Osterwalder, A., & Pigneur, Y. (2010). Business model generation: A handbook for visionaries, game changers, and challengers. Wiley.
14.	Government of India. (2020). Start-up India Action Plan. Department for Promotion of Industry and Internal Trade (DPIIT). https://www.startupindia.gov.in/
15.	Taneja, S. (2019). Start-up Ecosystem in India: The Role of Government. Journal of Entrepreneurship and Innovation, 8(1), 15–28.
16.	Gompers, P., & Lerner, J. (2004). The venture capital cycle (2nd ed.). MIT Press.
17.	Blank, S., & Dorf, B. (2020). The startup owner's manual: The step-by-step guide for building a great company (2nd ed.). Wiley.
18.	Ries, E. (2011). The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. Crown Publishing.
19.	Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2017). Entrepreneurship (10th ed.). McGraw-Hill Education
20.	Kuratko, D. F. (2014). Entrepreneurship: Theory, process and practice (9th ed.). Cengage Learning.

TEACHER'S MANUAL

Public Economics				
Sl. No	**Module**	**2Marks**	**5Marks**	**10Marks**
1	**Foundations of Public Economics**	Define public goods; Distinguish public and private finance	Explain market failure and its types	Analyze the role of government in correcting market failures using examples; discuss the principle of maximum social advantage
2	**Public Revenue**	Mention sources of public revenue; Define GST	Differentiate between direct and indirect taxes; explain canons of taxation	Evaluate the economic effects of taxation on efficiency and equity; critically examine GST's impact in India
3	**Public Expenditure**	Define public expenditure; Mention two canons of expenditure	Explain Wagner's Law and Peacock-Wiseman Hypothesis	Discuss the classification and growth of public expenditure and its effects on production, distribution, and welfare
4	**Public Debt and Management**	Define internal and external debt	Explain the burden of public debt; list debt redemption methods	Evaluate theories of public debt and assess India's debt management strategies and challenges
5	**Public Budget, Fiscal Policy & Deficit Management**	Define fiscal deficit, revenue deficit, primary deficit	Explain components and types of budgets; describe the FRBM Act	Assess the role of fiscal policy in macroeconomic stabilization and critically analyze India's deficit financing methods

Public Economics				
Sl. No	**Module**	**2Marks**	**5Marks**	**10Marks**

Development Economics				
Sl. No	**Module**	**2 Marks**	**5 Marks**	**10 Marks**
1	**Introduction to Economic Development**	Define HDI or Gini coefficient; distinguish growth and development	Explain indicators like PQLI and MPI	Discuss various indicators of development and their significance in measuring well-being and inequality
2	**General Theories of Growth and Development**	Mention any one classical development theory	Compare Ricardo's and Malthus's views on development	Critically evaluate Schumpeter's innovation theory and Rostow's stages of growth
3	**Partial Theories & Development Strategies**	Define capital-output ratio or Big Push Theory	Discuss balanced vs unbalanced growth strategies	Analyze the Lewis dual sector model and its relevance to labor transition in developing economies
4	**Sectoral View of Development**	Mention the role of SMEs or one feature of service sector	Describe the importance of agriculture in development	Examine the roles of agriculture, industry, and services in balanced economic development; analyse constraints and policies
5	**Environment, Sustainable & Inclusive Development**	Define sustainable development; list any SDG	Explain trade-offs between growth and sustainability	Assess the role of inclusive growth in modern development strategies and analyze outcomes of SDGs and MDGs

Formative Assessment

Pedagogy: Classroom lectures, tutorials, Problem-solving exercises, seminars, presentations, activities, group discussions, field visits, project work, etc.,

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Internal Test	50%
Assignment	20%
Seminar	30%
Total	100
Formative Assessment as per SEP guidelines are compulsory	

Note: Strictly follow the Practicum

Pedagogy; Evaluation process IA MARKS

FORMATIVE ASSESSMENT			
	C 1	**C 2**	**Total**
Assessment Occasion/type			
Internal Test	**5**	**5**	**10**
Assignment	**5**		**5**
Seminar		**5**	**5**
Total			**20**
Semester End Exam Theory			**80**

Note: Strictly follow the Practicum

Question Paper Pattern for 80 Marks for BA/B.Sc. in Economics

Part-A
Conceptual

Answer any **ten** of the following out of 12 questions (10X2 = 20),

1.

a)
b)
c)
d)
e)
f)
g)
h)
i)
j)
k)
l)

Part-B –Analytical (Questions for testing the knowledge of theories and application)

Answer any **six** of the following out of 8 questions (6X5=30)

2.
3.
4.
5.
6.
7.
8.
9.

Part-C-Descriptive (Questions for testing the critical ability of understanding)

Answer any **three** of the following out of 5 questions (3 X10=30)

10.

11.

12.

13.

14.