

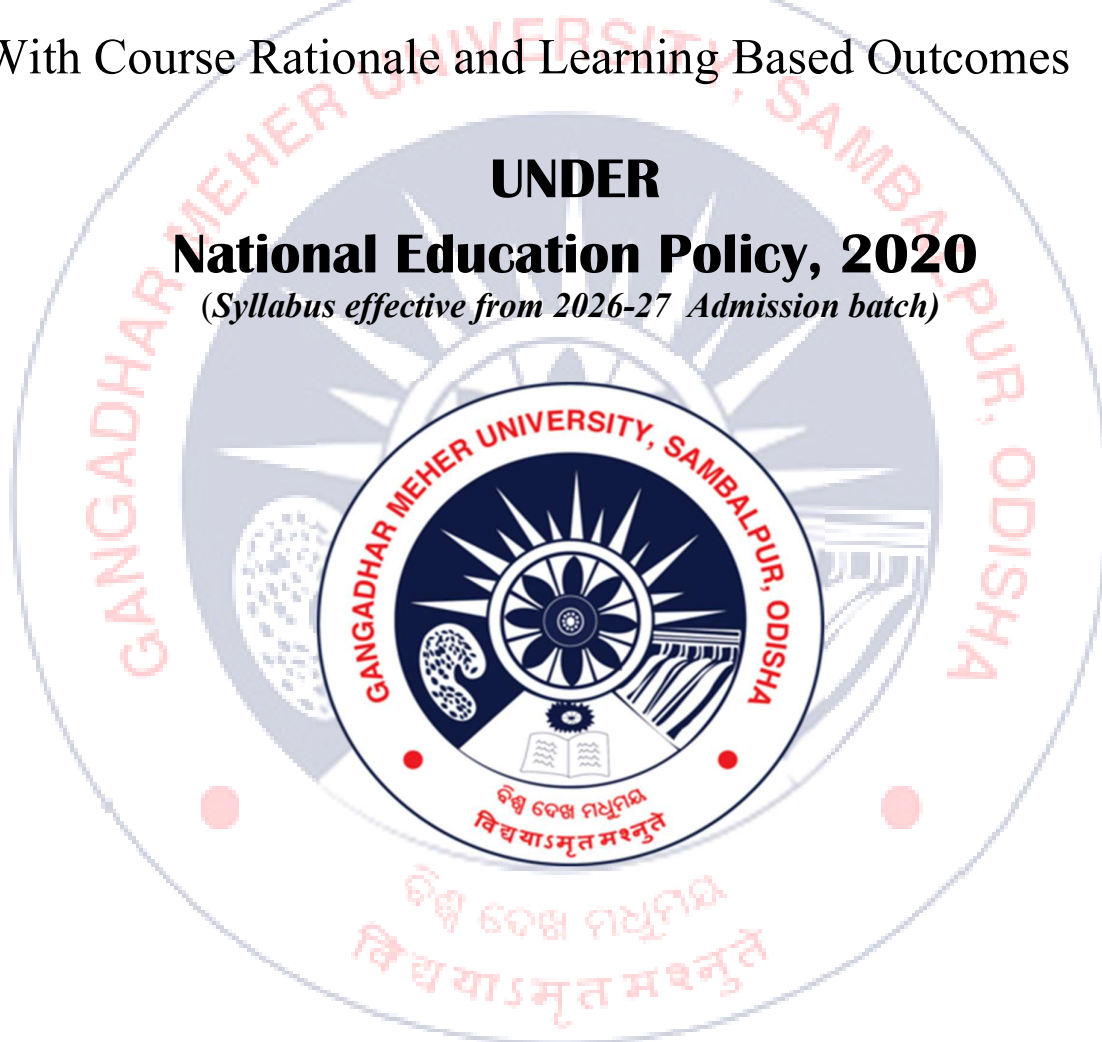
**SYLLABUS FOR
THREE YEAR GRADUATION
WITH
ONE MAJOR AND TWO MINOR**

(With Multiple Entry/Exit Option)

With Course Rationale and Learning Based Outcomes

**UNDER
National Education Policy, 2020**

(Syllabus effective from 2026-27 Admission batch)



School of Economics
Gangadhar Meher University
Amruta Vihar, Sambalpur-768004



About the School

School of Economics has been an integral part of the GM University since its inception as a college. However PG course was introduced in the session 1966-67. From the very beginning the department is contributing to the society and the nation through its teaching and research activities. The Department has introduced M.Phil and Ph.D. courses since the academic session 2018-19. The Department has adopted the UGC prescribed CBCS syllabus in toto since the academic session 2015-16. The sanctioned strength of students is 80 for each year at UG Honours level and 48 for each year at PG level. Further in MPhil courses the sanctioned strength of students is 08 and at Post Doctoral level it is 02 (two). On an average students have been maintaining consistently high academic performance. The department has illustrious alumni to its credit who have been involved with the administration of the country at national level. The School has organized a national seminar in March 2016 and an international seminar in February 2017. The School hosts 06 full-time faculty members, 01 Ph.D. student and 08 M.Phil. students. Their research focuses on topics in the areas of Microeconomics, Economic Theory, Agricultural Economics, Political Economy, State Finance, Tribal Development, Behavioural Economics and Financial Economics.

Dr. Pramod Kumar Mishra (IAS), Principal Secretary to The Prime Minister, India; Prof. Sudhansu Sekhar Rath (Former Vice-Chancellor, GMU); Prof. Deepak Ku. Mishra (Professor, JNU), Prof. Jugal Kishore Mohapatra (IAS), Shri Arun Ku. Pujari (IAS) are few proud alumni of the school.

Programme Outcomes of Three Year Graduation with Single Major & Two Minor

On successful completion of the programme, a student will be able to:

PO1: Gain an ability to understand economic theories and the functioning of basic microeconomic and macroeconomic systems.

PO2: Be able to apply knowledge and skill in the field of Economics, research, statistics, and mathematics and will be able to have employability in these areas.

PO3: Be ready for work in the Economic world like banking, industries, education, etc.

PO4: Be poised to go for higher studies and engage in research in the field.

Based on the above POs, the students are also expected to achieve the following programme specific outcomes.

PSO No	Programme Specific Outcomes (PSOs) Upon completion of this programme the student will be able :
PSO1 (Advanced Knowledge)	To acquire advanced knowledge of Economics & Development issues of Indian Economy in general and Economy of Odisha in particular.
PSO2 (Practical Ability)	To conduct economic analysis using mathematical and statistical techniques especially by developing questionnaire, collecting primary data through field surveys.
PSO3 (Forecasting changes and Future development)	To forecast the future course of changes and development through their knowledge of policies and programmes of government and development agencies in the larger issues of epistemology in social sciences.
PSO4 (Employability and Entrepreneurship)	To visualize the real-world situation and enhance entrepreneurial skills for their self-employment, to improve the general attitudes and living conditions of the masses.
PSO5 (Identify, Evaluate and Analyse)	To apply economic theory for critically analyzing the real national and international problems for a thorough evaluation of economic events and makes them responsible citizens.

Credit Structure for Three Year Graduation with Single Major & Two Minor

Semester	Core I	Core II	Core III	Multidisciplinary	AEC	SEC	VAC	Community Engagement & Services/ Field work/ Internship	Total Minimum Credit
I	2X4=8	1X4=4		1X3=3	1X4=4		1X3=3		22
II	2X4=8		1X4=4	1X3=3	1X4=4	1X3=3			22
									44
III	3X4=12	1X4=4		1X3=3			1X3=3		22
IV	3X4=12		1X4=4					1X4=4	20
									42
V	3X4=12	1X4=4				1X3=3	1X3=3		22
VI	2X4=8		1X4=4			1X3=3	1X3=3		18
									40
Total	15X4=60	3X4=12	3X4=12	3X3=9	2X4=8	3X3=9	3X4=12	1X4=4	126

***In case a student opts for NCC and clears 'C' certificate additional 16 Credit shall be awarded and total credit shall be 126+16 = 142 Credit**

Course Code	Course Title	Programme Outcomes				Programme Specific Outcomes				
		1	2	3	4	1	2	3	4	5
	Basic Economics I	✓	✓		✓	✓	✓	✓		✓
	Indian Economy I	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Basic Economics II	✓	✓			✓	✓	✓		✓
	Indian Economy II	✓	✓	✓	✓	✓	✓	✓		✓
	Microeconomics I	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Macroeconomics I	✓	✓			✓	✓	✓		✓
	Mathematical Methods for Economics I	✓	✓		✓	✓	✓	✓		✓
	Microeconomics II	✓	✓	✓	✓	✓	✓	✓		✓
	Macroeconomics II	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Statistical Methods for Economics	✓	✓		✓	✓	✓	✓		✓
	Development Economics I	✓	✓		✓	✓	✓	✓		✓
	Mathematical Methods for Economics II	✓	✓	✓	✓	✓	✓	✓		✓
	History of Economic Thought Or Money and Banking Or Economy of Odisha	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Introductory Econometrics Or Public Economics I Or Development Economics II	✓	✓	✓	✓	✓	✓	✓		✓
	15. Computational Methods in Economics Or Environmental Economics Or International Economics	✓	✓	✓		✓	✓	✓		✓

Teaching Learning Process

Teaching and learning is a continuous process which is surrounded by students' attitude to learn & share the knowledge, academic curiosity, reading & practicing, creativity, thinking ability and extending knowledge levels. Therefore, the teaching learning process of the programme focuses on learner-centric pedagogies, and interactive and participatory pedagogies. Planning for teaching constitute a critical dimension. The teaching and learning process revolves around a well-structured and sequenced acquisition of knowledge and skills.

Teaching and learning under this programme involves classroom lectures as well tutorials. The tutorials allow a closer interaction between the students and the teacher as each student gets individual attention. For a visual and better learning outcomes instructors would use ICT facilities, e-learning platforms and other innovative e-content platforms for student-centric learning methods. As part of participative teaching-learning practices few courses include seminars, presentations and group discussions. To cater the needs of slow and advance learners, special, remedial and peer teaching classes will be encouraged. Apart from these, exposure visits, special lectures by invited experts, workshops, and National/International seminars are to be held to augment knowledge, encourage innovative ideas and expose the students to global academic and research advancement. There is also the provision of mentor- mentee for each class where the mentor can keep track of each student's progress and address her/his individual difficulties. For the experiential learning course on project work is offered (i.e. short-term projects, research projects, assignments and fieldworks), which is the integral components of the programme that enable the students to solve practical problems. The provision of written assignments and projects submitted by students as part of the course, are also to be discussed in special classes. Some courses also have a laboratory component and for each course students will be assigned regular home assignments and will be tested periodically through quizzes and class tests to ensure that they have properly learnt the course material.

Course structure of Three Year Graduation with Single Major & Two Minor

Semester	Course		Course Name	Credits
I	Core I	Paper-1	Basic Economics I	04
		Paper-2	Indian Economy I	04
	Core II	Paper 1	Basic Economics I	04
	Multidisciplinary	MDC 1	Organisational Behaviour	03
	AEC	AEC 1	Odia	04
	VAC	VAC 1	Environmental Studies & Disaster Management	03
				22
II	Core I	Paper-3	Basic Economics II	04
		Paper-4	Indian Economy II	04
	Core III	Paper 1	Basic Economics II	04
	Multidisciplinary	MDC 2	Demography	03
	AEC	AEC 2	English	04
	SEC	SEC 1	Principles of Management	03
				22
III	Core I	Paper-5	Microeconomics I	04
		Paper-6	Macroeconomics I	04
		Paper-7	Mathematical Methods for Economics I	04
	Core II	Paper 2	Development Economics I	04
	Multidisciplinary	MDC 3	Mathematical Finance	03
	VAC	VAC 2	Ethics and Values	03
				22
IV	Core I	Paper-8	Microeconomics II	04
		Paper-9	Macroeconomics II	04
		Paper-10	Statistical Methods for Economics	04
	Core III	Paper 2	Public Economics I	04
		Community Engagement & Services/ Field work/Internship		04
				20
V	Core I	Paper-11	Development Economics I	04
		Paper-12	Mathematical Methods for Economics II	04
		Paper-13	History of Economic Thought/ Money and Banking/ Economy of Odisha	04
	Core II	Paper 3	International Economics	04
	SEC	SEC 2	Data Analytics I	03
	VAC	VAC 3		03
				22
VI	Core I	Paper-14	Introductory Econometrics /Public Economics I /Development Economics II	04
		Paper 15	Computational Methods in Economics/ Environmental Economics / International Economics	04
	Core III	Paper 3	Money and Banking	04
	SEC	SEC 3	Data Analytics II	03
	VAC	VAC 4		03
				18
			Total	126

SEMESTER I

Semester	Course	Course Name	Credits
I	Core I	Basic Economics I	04
		Indian Economy I	04
	Core II	Basic Economics II	04
	Multidisciplinary	Organisational Behaviour	03
	AEC	Odia	04
	VAC	Environmental Studies & Disaster Management	03
			22

CORE I

Major Paper 1: Basic Economics I

Introduction:

This course is designed to expose the students to the basic principles of how the economy works at the microeconomic level with some basic concepts like markets, and consumer choice. This course also discusses the preliminary macroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.

Course Outcomes (COs)

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

CO1: To expose the students to the introductory micro and macro-economic concepts.

CO2: To explain how to think like an economist and illustrate how microeconomic concepts can be applied to analyses of real-life situations.

CO3: To introduce preliminary macroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.

CO4: To examine the circular flow of income and expenditure in a 2, 3, and 4-sector economy.

Unit I: Exploring the Subject Matter of Economics, Markets and Welfare

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The Economist as Scientist – The scientific method: Observation, Theory and more observation; Role of Assumptions; Economic Models; Why economists disagree; Graphs in Economics; The Market Forces; Markets and Competition; The Demand and Supply curves – Market vs Individual curves, Shifts in Demand and Supply curves; Market Equilibrium and changes therein; Price Elasticity of Demand – determinants and computation; Income and Cross Elasticity of Demand; The Price Elasticity of Supply – determinants and computation; Consumer and Producer Surplus.

Unit II: Theory of Consumer Choice

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of Indifference Curves; Two extreme examples of indifference curves; Optimization – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and Substitution Effect; Derivation of Demand Curve; Three applications – Demand for Giffen goods, Wages and Labour Supply, Interest rate and Household saving.

Unit III: Basic Concepts in Macroeconomics

Macro vs. Micro Economics; Limitations of Macroeconomics; Stock and Flow variables, Equilibrium and Disequilibrium, Partial, and General Equilibrium Statics – Comparative Statics and Dynamics; National Income Concepts – GDP, GNP, NDP, and NNP at market price, factor cost, real and nominal; Disposable Personal Income.

Unit IV: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2-sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare; Green Accounting.

Text Book:

✓ Gregory N Mankiw: *Principles of Economics*, 6th Edition, Cengage Learning India Private Limited, New Delhi

✓ Gregory N. Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi

✓ Government of India (2012): *National Accounts Statistics Sources and Methods*, CSO, MOSPI

Reference Book:

✓ Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

✓ Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3

Major Paper 2: Indian Economy I

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list should be updated annually.

Course Outcomes

- CO1: To have an understanding of the evolution of the Indian economy from pre-colonial to modern times, and its current state as a developing economy.
- CO2: To be able to explain the relationship between population growth, human development, and economic development in India.
- CO3: To be able to assess the national income trends in India, including sectoral composition, regional disparities, and challenges like poverty, inequality, and unemployment.
- CO4: To gain the ability to critically analyze the role of economic planning in India's development, including the evolution from Five-Year Plans to NITI Aayog.

Unit I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organization of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralization; The Land System and Commercialization of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonization and Modernization State Policies and Economic Underdevelopment; The Current State of Indian Economy

Unit II: Population and Human Development

Population Growth and Economic Development – size, growth and Future of Population; Causes of rapid Population Growth; Population and Economic Development; Population Policy; Demographic Issues– Sex and Age Composition of Population; Demographic Dividend; Urbanization and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

Unit III: National Income in India: The Growth Story and Current Challenges

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage; Poverty – Estimation and Trends, Poverty Alleviation Programs– MGNREGA, NRLM, SJSRY; Inequality – Measures and trends in India; Unemployment– Nature, Estimates, Trends, Causes and Employment Policy.

Unit IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan– Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy; From Planning to NITI– Transforming India's Development Agenda.

Text Book:

✓ Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai

Reference Books:

✓ Dutt R. and Sundharam K. P. M: *Indian Economy*. S. Chand & Company Ltd., New Delhi.

✓ Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand: *Indian Economy*, Publications, 7th Revised Edition

✓ *Indian Economy Since Independence*, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09

✓ Government of India (Current Year): *Economic Survey*, Ministry of Finance, New Delhi

✓ Basu, K. (2008): *Oxford Companion to Economics in India*, Oxford University Press

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3

CORE II

Minor 1 Paper 1: Basic Economics I

Introduction:

This course is designed to expose the students to the basic principles of how the economy works at the microeconomic level with some basic concepts like markets, and consumer choice. This course also discusses the preliminary macroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.

Course Outcomes (COs)

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

CO1: To expose the students to the introductory micro and macro-economic concepts.

CO2: To explain how to think like an economist and illustrate how microeconomic concepts can be applied to analyses of real-life situations.

CO3: To introduce preliminary macroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.

CO4: To examine the circular flow of income and expenditure in a 2, 3, and 4-sector economy.

Unit I: Exploring the Subject Matter of Economics, Markets and Welfare

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The Economist as Scientist – The scientific method: Observation, Theory and more observation; Role of Assumptions; Economic Models; Why economists disagree; Graphs in Economics; The Market Forces; Markets and Competition; The Demand and Supply curves – Market vs Individual curves, Shifts in Demand and Supply curves; Market Equilibrium and changes therein; Price Elasticity of Demand – determinants and computation; Income and Cross Elasticity of Demand; The Price Elasticity of Supply – determinants and computation; Consumer and Producer Surplus.

Unit II: Theory of Consumer Choice

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of Indifference Curves; Two extreme examples of indifference curves; Optimization – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and Substitution Effect; Derivation of Demand Curve; Three applications – Demand for Giffen goods, Wages and Labour Supply, Interest rate and Household saving.

Unit III: Basic Concepts in Macroeconomics

Macro vs. Micro Economics; Limitations of Macroeconomics; Stock and Flow variables, Equilibrium and Disequilibrium, Partial, and General Equilibrium Statics – Comparative Statics and Dynamics; National Income Concepts – GDP, GNP, NDP, and NNP at market price, factor cost, real and nominal; Disposable Personal Income.

Unit IV: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2-sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare; Green Accounting.

Text Book:

✓ Gregory N Mankiw: *Principles of Economics*, 6th Edition, Cengage Learning India Private Limited, New Delhi

✓ Gregory N. Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi

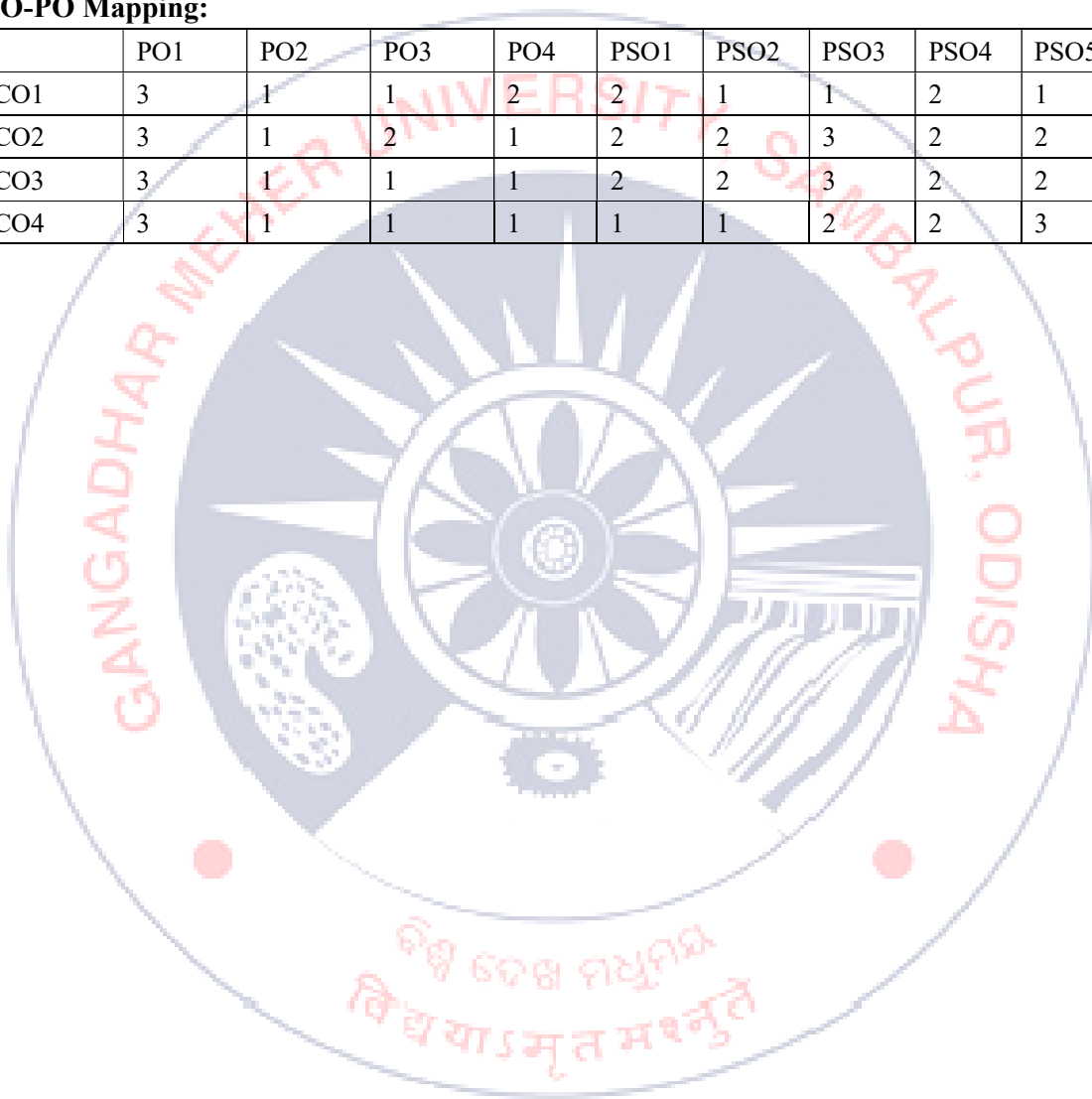
✓ Government of India (2012): *National Accounts Statistics Sources and Methods*, CSO, MOSPI
Reference Book:

✓ Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

✓ Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3



**MULTIDISCIPLINARY
MDC 1: Organisational Behaviour**

Introduction:

The course introduces basic concepts of Organizational Behaviour and its applications in contemporary organizations. The course will develop the understanding of how individual, groups and structure have impacts on the organizational effectiveness and efficiency.

Course Outcomes (COs)

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

- CO1: To understand the conceptual framework of the discipline of OB and its practical applications in the organizational set up
- CO2: To deeply understand the role of individual, groups and structure in achieving organizational goals effectively and efficiently
- CO3: To critically evaluate and analyze various theories and models that contributes in the overall understanding of the discipline
- CO4: To develop creative and innovative ideas that could positively shape the organizations

Unit I Organizational Behavior:

Learning objectives, Definition & Meaning, Why to study OB, An OB model, New challenges for OB Manager LEARNING: Nature of learning, How learning occurs, Learning, Theories of learning- Classical conditioning ,Operant conditioning, social learning, cognitive learning & OB Case Study Analysis

Unit II PERSONALITY:

Meaning & Definition, Determinants of Personality, Personality Traits, Personality & OB PERCEPTION: Meaning & Definition, Perceptual process, Importance of Perception in OB MOTIVATION: Nature & Importance, Herzberg's Two Factor theory, Maslow's Need Hierarchy theory, Alderfer's ERG theory Case Study Analysis.

Unit III

COMMUNICATION: Importance, Types, Barriers to communication, Communication as a tool for improving Interpersonal Effectiveness **GROUPS IN ORGANISATION:** Nature, Types, Why do people join groups, Group Cohesiveness & Group Decision Making- managerial Implications, Effective Team **Building LEADERSHIP:** Leadership & management, Theories of leadership- Trait theory, Behavioural Theory, Contingency Theory, Leadership & Followership, How to be an Effective **Leader CONFLICT:** Nature of Conflict & Conflict Resolution **TRANSACTIONAL ANALYSIS:** An Introduction to Transactional Analysis Case Study Analysis

Unit IV Organizational Culture:

Meaning & Definition, Culture & Organisational Effectiveness **HUMAN RESOURCE MANAGEMENT:** Introduction to HRM, Selection, Orientation, Training & Development, Performance Appraisal, Incentives **ORGANISATIONAL CHANGE:** Importance of Change, Planned Change & OB Techniques .

ORGANISATIONAL DEVELOPMENT: Pre-requisites for OD,OD interventions.

Text Books

✓ Organisation Behaviour- K. Aswathappa- Himalaya Publisher



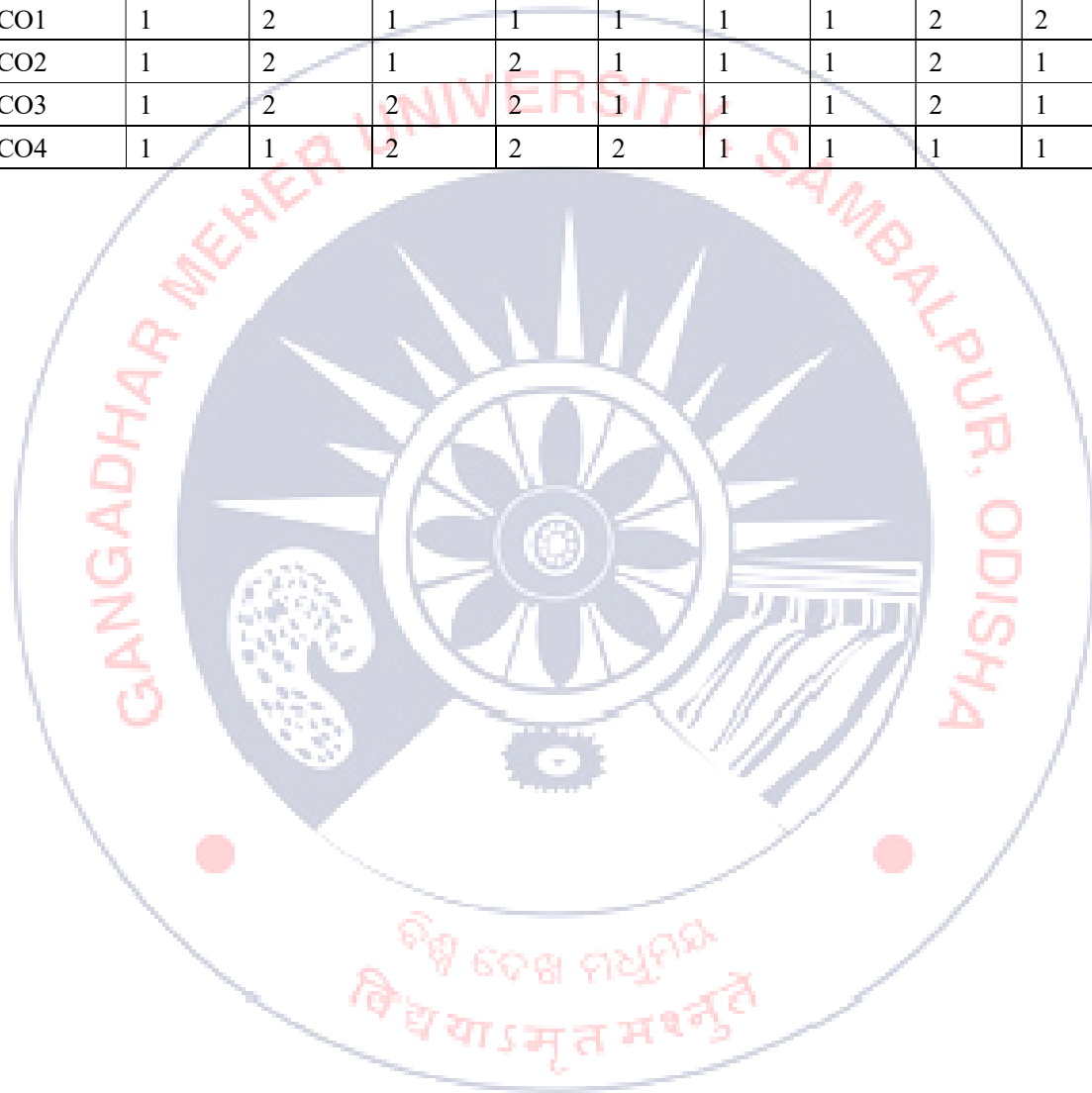
✓ *Essential of Organisation Behaviour –Robins –PHP*

References

✓ *Organisation Theory and behavior - S KGupta& R.Joshi-Kalyani Publishers*

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	1	1	1	1	1	2	2
CO2	1	2	1	2	1	1	1	2	1
CO3	1	2	2	2	1	1	1	2	1
CO4	1	1	2	2	2	1	1	1	1



SEMESTER II

Semester	Course	Course Name	Credit
II	Core I	Basic Economics II	04
		Indian Economy II	04
	Core III	Basic Economics II	04
	Multidisciplinary	Demography	03
	AEC	English	04
	SEC	Principles of Management	03
			22

CORE I

Major Paper 3: Basic Economics II

Course Description

This course is designed to expose the students to the basic principles of how the economy works at the microeconomic level with some basic concepts like production, firms and input markets. This course also aims to introduce the students to the basic macroeconomic concepts of money, inflation, and the theories of determination of income and employment in the aggregate economy.

Course Outcomes (COs)

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

- CO1: To have a clear idea about the principles that govern the economy's running at the micro and macro levels.
- CO2: To understand about the working of the input market.
- CO3: To gain clarity about dynamic concepts of Inflation, Employment, money, and income.
- CO4: To understand of the theories of determination of income and employment in the aggregate economy.

Unit I: The Firm and Market Structures

Cost concepts; Production and Costs; The various measures of cost – Fixed and Variable cost, Average and Marginal cost; Cost curves and their shapes; Costs in the short run and the long run; Economies and diseconomies of scale. Firms in Competitive Markets – What is a competitive market; Profit maximization and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run

Unit II: The Input Markets

The Demand for Labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the Labour Market; Other factors of production: Land and Capital; Linkages among factors of production

Unit III: Money and Changes in its Value

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices Inflation – Meaning, Causes, and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Inflationary Gap, Deflation- Meaning, Causes, and Anti- Deflationary measures, Depression and Stagflation; Inflation vs. Deflation

Unit IV: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier

Text Book:

- ✓ Gregory N Mankiw: *Principles of Economics*, 6th Edition, Cengage Learning India Private Limited, New Delhi
- ✓ Gregory N. Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
- ✓ Government of India (2012): *National Accounts Statistics Sources and Methods*, CSO, MOSPI

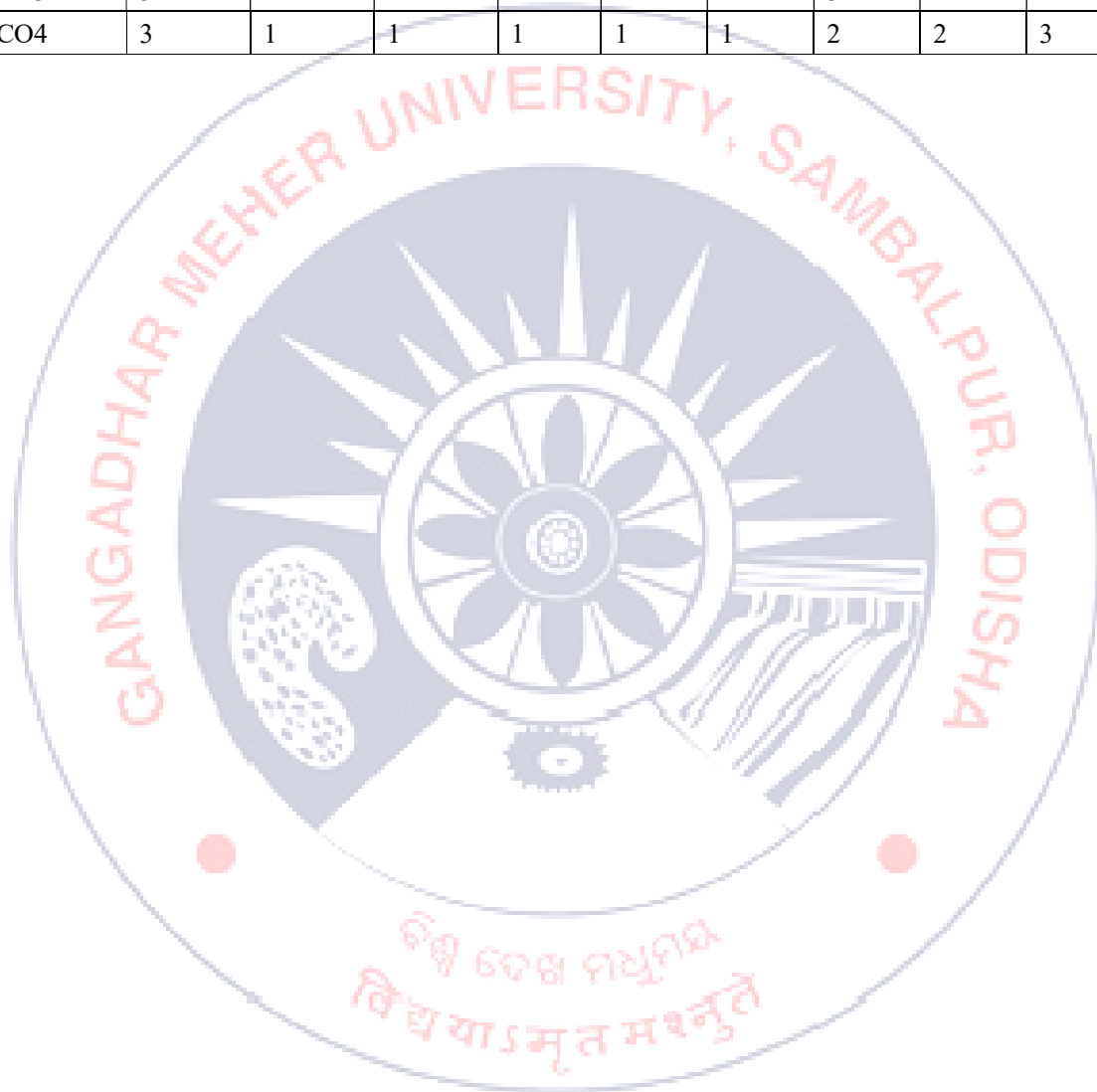
Reference Book:

✓ Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

✓ Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3



Major Paper 4: Indian Economy II

Course Description

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list should be updated annually.

Course Outcomes (COs)

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

- CO1: To analyze the current state of Indian agriculture, including production trends, factors influencing production, and policy initiatives like land reforms and the green revolution.
- CO2: To evaluate the development of Indian industries, including historical industrial policies, challenges faced by small-scale industries, and the role of labor.
- CO3: To assess the contribution of the tertiary sector to the Indian economy, and understand the concept of Human Resource Development (HRD) and its role in India's development.
- CO4: To explain India's foreign trade scenario, including trade composition, export promotion strategies, and the role of foreign capital.
- CO5: To analyze the environmental policies implemented in India and the global response to climate change, considering India's specific situation.

Unit I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

Unit II: Industrial Development in India

Trends in industrial output and productivity; Industrial Policies of 1948, 1956, 1977, and 1991; Industrial Licensing Policies – MRTP Act, FERA, and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labor.

Unit III: Tertiary Sector, HRD, and the External Sector

Tertiary Sector: growth and contribution of the service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition. Foreign Trade: role, composition, and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

Unit IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development 1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India.

Text Book:

✓ Mishra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai

Reference Books:

✓ Dutt R. and Sundharam K. P. M.: *Indian Economy*. S. Chand & Company Ltd., New Delhi.

✓ Datt and Sundharam, Gaurav Datt and Ashwani Mahajann: *Indian Economy*, S Chand Publications, 7th Revised Edition

✓ *Indian Economy Since Independence*, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09

✓ Government of India (Current Year): Economic Survey, Ministry of Finance, New Delhi

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3
CO5	3	1	1	1	1	1	2	2	3



CORE III

Minor 2 Paper 1: Basic Economics II

Course Description

This course is designed to expose the students to the basic principles of how the economy works at the microeconomic level with some basic concepts like production, firms and input markets. This course also aims to introduce the students to the basic macroeconomic concepts of money, inflation, and the theories of determination of income and employment in the aggregate economy.

Course Outcomes (COs)

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

CO1: To have a clear idea about the principles that govern the economy's running at the micro and macro levels.

CO2: To understand about the working of the input market.

CO3: To gain clarity about dynamic concepts of Inflation, Employment, money, and income.

CO4: To understand of the theories of determination of income and employment in the aggregate economy.

Unit I: The Firm and Market Structures

Cost concepts; Production and Costs; The various measures of cost – Fixed and Variable cost, Average and Marginal cost; Cost curves and their shapes; Costs in the short run and the long run; Economies and diseconomies of scale. Firms in Competitive Markets – What is a competitive market; Profit maximization and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run

Unit II: The Input Markets

The Demand for Labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the Labour Market; Other factors of production: Land and Capital; Linkages among factors of production

Unit III: Money and Changes in its Value

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices Inflation – Meaning, Causes, and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Inflationary Gap, Deflation- Meaning, Causes, and Anti- Deflationary measures, Depression and Stagflation; Inflation vs. Deflation

Unit IV: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier

Text Book:

✓ Gregory N Mankiw: *Principles of Economics*, 6th Edition, Cengage Learning India Private Limited, New Delhi

✓ Gregory N. Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi

✓ Government of India (2012): *National Accounts Statistics Sources and Methods*, CSO, MOSPI

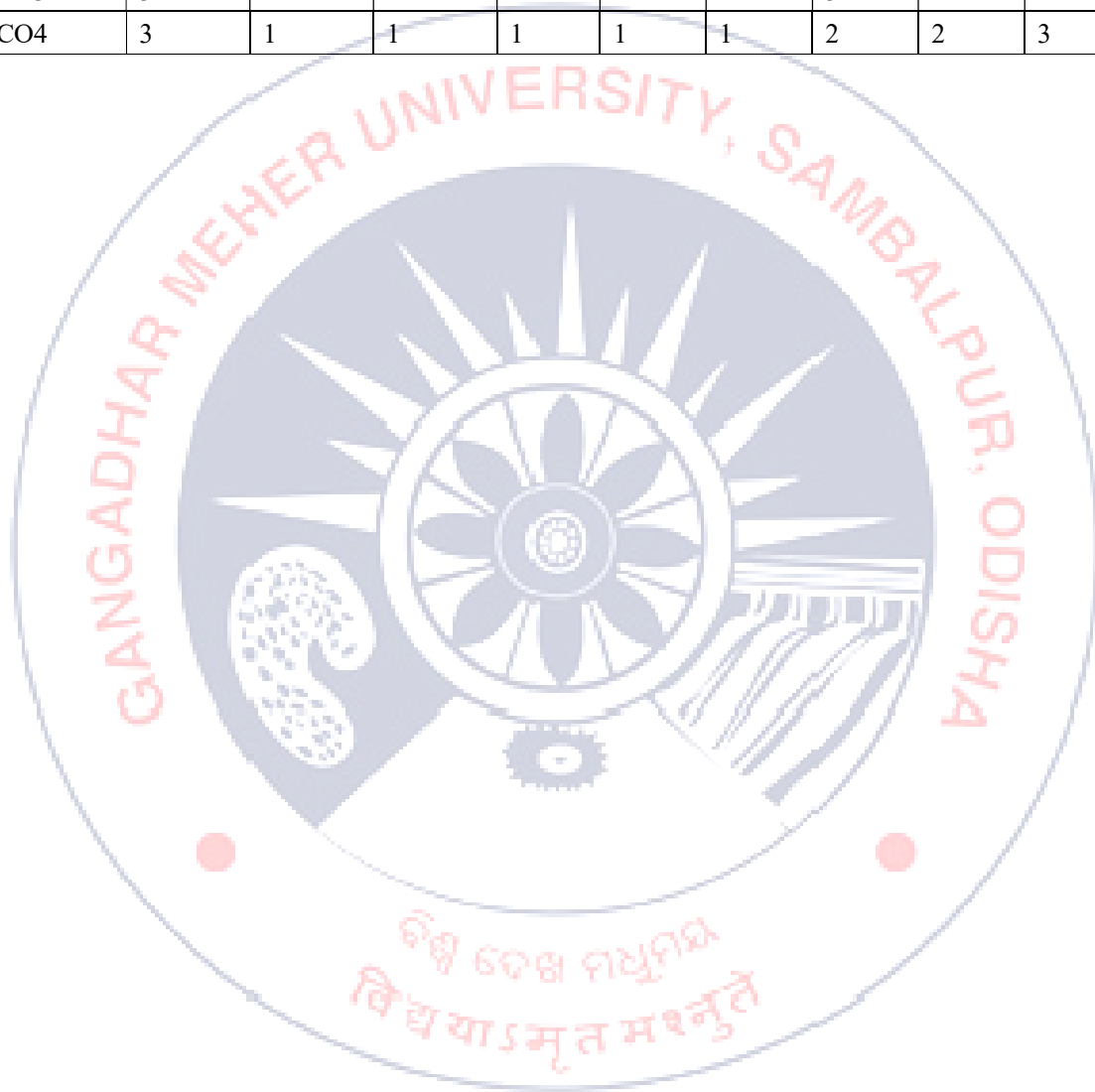
Reference Book:

✓ Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

✓ Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3



MULTIDISCIPLINARY MDC2: Demography

Course Outcomes (COs)

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

CO1: Understand of key concepts of demography as a discipline

CO2: Examine population dynamics and resultant socioeconomic issues and problems.

CO3: Compare and relate population growth and distribution of developed and developing countries

Unit-1:

Introduction: Demography - Its Definition, Nature and Scope; Relationship with other disciplines; Demographic Balancing Equation; Sources of Demographic Data in India: Salient Features of Census, Civil Registration System, National Sample Survey, National Family Health Survey; Population Distribution and Growth – Measures and Determinants; Concepts of Rate, Ratio and Proportion.

Unit -II:

World Population Growth; Doubling time; Population Growth in India; Population Dynamics: Fertility, Mortality and Migration - Measures, Determinants and Implications; Theories of Population - Malthusian Theory and theory of Demographic Transition, Population policies and programmes in India.

Unit-III: Practical

1. Arithmetic and Geometric Projection - Calculation and Graphical display;
2. Construction of population pyramid,
3. Construction of Lorenz Curve
4. Calculation and presentation of Population Growth Rate, Crude Birth Rate, Age-Specific Fertility Rate, Infant and Neonatal Mortality Rate, Maternal Mortality Ratio Based on Supplied Data.
5. Practical Record and Viva-Voce.

Text Books:

- ✓ Chandna, R. C. (2015). *An Introduction to Population Geography*, Kalyani Publishers.
- ✓ Hassan, M.I (2020). *Population Geography: A Systematic Exposition*, Routledge, London and New York.

Reference Books:

- ✓ Bhende, A. and Kanitkar T. (2000). *Principles of Population Studies*, Himalaya Publishing House.
- ✓ Pathak, K.B and F. Ram (2016). *Techniques of Demographic Analysis*, Himalaya Publishing House, Mumbai.
- ✓ Srinivasan, K (1998). *Basic Demographic Techniques and Applications*, Sage Publications, New Delhi.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	1	2	1
CO2	3	1	2	1	2	2	3	2	2
CO3	3	1	1	1	2	2	3	2	2
CO4	3	1	1	1	1	1	2	2	3

SKILL ENHANCEMENT COURSE

SEC 1: Principles of Management

Introduction:

The course is designed to understand the basic principles of management and to provide an insight into different management functions and strategies.

Course Outcomes (Cos)

Upon completion of this course, students will be able to:

CO1: Understand the evolution management and various school of thoughts

CO2: Learn different management functions and decision-making process

CO3: Know about different leadership styles and importance of co-ordination

CO4: Learn about the need for strategic management

Unit I:

Nature of Management: Meaning, Definition, its nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration- Organization. Evolution of Management Thought: Contribution of F.W. Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Various approaches to management (i.e. Schools of management thought) Indian Management Thought.

Unit II:

Functions of Management (Part-I) Planning - Meaning - Need & Importance, types levels- advantages & limitations, Forecasting - Need & Techniques, Decision making - Types - Process of rational decision making & techniques of decision making. Organizing - Elements of organizing & processes: Types of organizations, Delegation of authority - Need, difficulties in delegation – Decentralization.

Unit III:

Functions of Management (Part-II) Staffing - Meaning & Importance, Direction - Nature – Principles, Communication - Types & Importance, Motivation - Importance – theories, Leadership - Meaning - styles, qualities & functions of leaders. Controlling- Need, Nature, importance, Process & Techniques, Coordination - Need, Importance.

Unit IV:

Strategic Management Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India.

Text Books:

- ✓ *Essential of Management* by Horold Koontz & Iteinz Weibrich, McGraw-Hills International.
- ✓ *Essential of Business Administration* by K. Aswathapa, Himalaya Publishing House.
- ✓ *Principles & Practice of Management* by L.M. Prasad, Sultan Chand & Sons pub.
- ✓ *Principles of Management* by Tripathi & Reddy, Tata McGraw Hill

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	1	1	1	1	1	2	2
CO2	1	2	1	2	1	1	1	2	1
CO3	1	2	2	2	1	1	1	2	1
CO4	1	1	2	2	2	1	1	1	1

VOCATIONAL COURSE

Data Analysis using Spread sheet

Introduction:

The objective is to enhance the knowledge of statistics and enable students to make sense of data by analyzing and visualizing it using spreadsheets, interpreting the results and gaining insights.

Learning Outcomes:

Upon completion of this course, students will be able to:

CO1: Learn the use different functions in spreadsheets

CO2: Do data analysis using basic and advanced statistical functions

CO3: Learn the use of tools for visualization

CO4: Do complex level data analysis

UNIT-1:

Data Handling: Spreadsheet concepts, Managing worksheets, Formatting cells, Entering data, Handling operators in formula, Cell referencing and naming of cells and cell ranges, Sorting, Multilayer sorting, Data validation, Find and Replace, Paste special, Filter and advanced filter, Formatting as table, Pivot tables, Formulae vs functions, Cell formulae vs Array formulae. Mathematical functions, Statistical functions, Logical functions, Date and Time functions, Lookup and reference: Hlookup, and Vlookup, Index and Match functions, Text functions. What-if-analysis: Goal-seek, Data tables, Scenario manager.

UNIT-2:

Data Analysis: Explore a data model: its content, and its structure, using the Power Pivot add-in. Learning DAX formula language. Create calculated fields and calculated measure for each cell, filter context for calculation, and explore several advanced DAX functions. Cube formulas to retrieve data from data model.

UNIT-3:

Data Visualization: Different types of charts including Pivot charts: Column, Line, Pie, Bar, Scatter charts. Fine tuning of charts: Chart Elements, Chart Styles, Chart Filters, Box Plot.

UNIT-4:

Utilities and Protection: What-if scenarios, goal-seek, solver, data validation, creating a dropdown list from a range of cells, data filtering and sorting, calculations using linked sheets, detective tools. Passwords and digital signatures in Spreadsheets

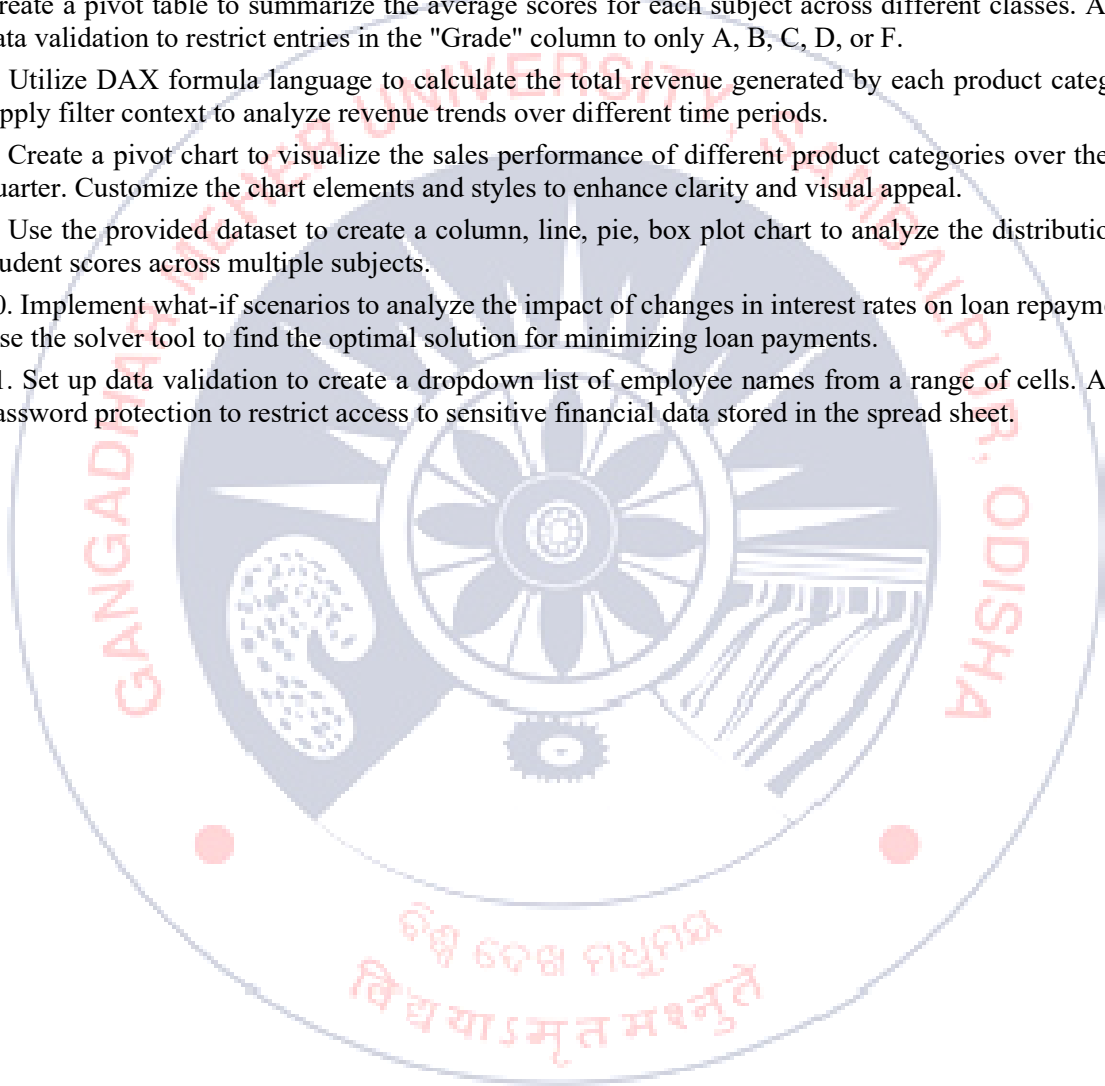
Books:

- ✓ Mali, L., *Libre Office 5.1 Writer, Calc: Math Formula Book - Vol 1*. Notion Press
- ✓ Libre Office 7.0 Calc Guide.
- ✓ Goldmeier, J., *Advanced Excel Essentials*, Apress, 2014
- ✓ Schmuller, J., *Statistical Analysis with Excel for Dummies*, 4th Edition, Wiley India

Lab: Data Analysis using Spread sheet

1. You are given a dataset containing sales data for a retail company. Perform the following tasks using spreadsheet software: Format the cells in the "Sales Amount" column as currency with two decimal places. Use the SUM function to calculate the total sales amount for the dataset.
2. You are managing inventory data for a retail store. Use mathematical functions to calculate the total value of the inventory based on the unit price and quantity of each item in stock.

3. Analyze the sales performance data for a company over the past year. Use statistical functions to calculate the mean, median, and standard deviation of monthly sales figures to identify trends and fluctuations.
4. Create a spreadsheet to track student attendance. Use logical functions to automatically mark students as "Present" or "Absent" based on their attendance record, considering specific criteria such as late arrivals or early departures.
5. Develop a project timeline for a software development project. Use date and time functions to calculate project milestones, deadlines, and durations based on the start date and estimated completion times for each task.
6. Analyze student performance data. Use the provided dataset and perform the following actions: Create a pivot table to summarize the average scores for each subject across different classes. Apply data validation to restrict entries in the "Grade" column to only A, B, C, D, or F.
7. Utilize DAX formula language to calculate the total revenue generated by each product category. Apply filter context to analyze revenue trends over different time periods.
8. Create a pivot chart to visualize the sales performance of different product categories over the last quarter. Customize the chart elements and styles to enhance clarity and visual appeal.
9. Use the provided dataset to create a column, line, pie, box plot chart to analyze the distribution of student scores across multiple subjects.
10. Implement what-if scenarios to analyze the impact of changes in interest rates on loan repayments. Use the solver tool to find the optimal solution for minimizing loan payments.
11. Set up data validation to create a dropdown list of employee names from a range of cells. Apply password protection to restrict access to sensitive financial data stored in the spread sheet.



Semester III				
III	Core I	Paper-5	Microeconomics I	04
		Paper-6	Macroeconomics I	04
		Paper-7	Mathematical Methods for Economics I	04
	Core II		Development Economics I	04
	Multidisciplinary		Mathematical Finance	03
	VAC			03
				22

CORE I

Major Paper 5: Microeconomics I

Course Description

The course is designed to provide sound training in microeconomic theory to formally analyze the behavior of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behavior of the consumer and the producer and also covers the behavior of a competitive firm.

Course Outcomes (COs)

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

Course Outcomes:

CO1: To develop an understanding of preferences and consumer choice and formally analyze the behavior of individual agents

CO2: To be able to use mathematical tools to facilitate understanding of the basic concepts of Economics.

CO3: To understand the behavior of the consumer and the producer.

CO4: To understand the behavior of a competitive firm.

Unit I: Consumer Theory I

Preferences and Utility, Axioms of Rational Choice, Utility, Trades and Substitutions, indifference curves; Mathematics of Indifference curves, Utility functions for specific preferences, the many good cases; Utility Maximization and choice: the 2-good case (graphical analysis), the n-good case, Indirect utility function, the Lump sum principle, Expenditure minimization, properties of the expenditure function

Unit II: Consumer Theory II

The Income and Substitution Effects: Demand function, changes in income, changes in goods price- Direct and Indirect Approaches (Slutsky), the Individual's Demand Curve, Compensated (Hicksian) demand curves and functions, demand elasticity, Consumer Surplus, Demand relationships among goods, the 2-good case, substitutes and complements, Net (Hicksian) substitutes, and Complements, Substitutability with many goods

Unit III: Production Theory and Costs

Production Functions: Marginal productivity, Production with One Variable Input (labour) and with Two-Variable Inputs, Isoquant Maps and the Rate of Technical Substitution, Returns to Scale, Elasticity of Substitution, Some Simple Production Functions: Linear, Fixed Proportions; Technical Progress. Definition of Cost and its properties, Cost minimizing input choices (Optimization principles, Expansion Path), Cost Functions and Shift in Cost Curves, Long-Run versus Short-Run Cost Curves

Unit IV: Profit Maximization

The Nature and Behaviour of Firms, Marginal Revenue – Relationship between Average and marginal revenue, Short-Run Supply by a Price-Taking Firm, Profit Functions and its Properties, Profit maximization – General conditions, Input demands

Text Book:

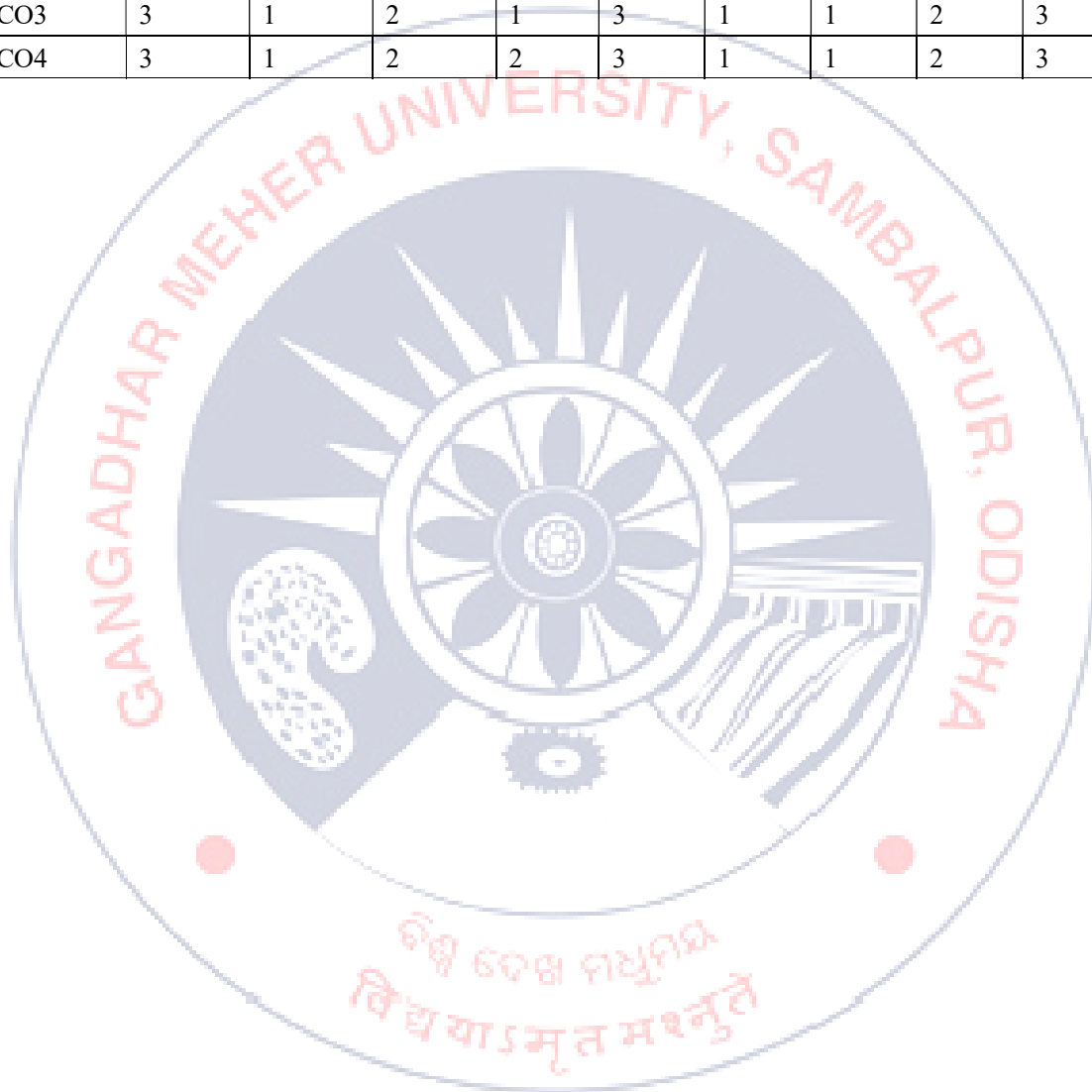
✓ C. Snyder and W. Nicholson (2012): *Microeconomic Theory: Basic Principles and Extensions*, 11th Edition, Cengage Learning, Delhi, India

Reference Books:

✓ H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	2	3	1	1	2	3
CO2	3	1	2	2	3	1	1	2	3
CO3	3	1	2	1	3	1	1	2	3
CO4	3	1	2	2	3	1	1	2	3



Major Paper 6: Macroeconomics I

Course Description

This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as long run, and the role of policies in this context.

Course Outcomes:

CO 1: To understand the basics of consumption function and its relation with income, and factors influencing consumption function.

CO2: To get a knowledge about various types of investment spending and evaluate the impact of investment through multiplier and accelerator in economies.

CO3: Discuss the various approaches to demand and supply of money.

CO4: Analyse and interpret the IS-LM model as a step toward understanding economic fluctuations.

Unit I: Consumption

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent, and Life-cycle hypothesis

Unit II: Investment

Autonomous and Induced Investment, Residential and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI, Theories of Investment: The Accelerator and Tobin's theory

Unit III: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical, and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money – Classical and Keynesian Approaches, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India, RBI approach to money supply, Determination and Money multiplier. High-powered money and money multiplier

Unit IV: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium

Text Readings:

✓ N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi.

✓ Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

Reference Book:

✓ Snowdon, B. and Vane H. R. (2005). *Modern macroeconomics –its Origins, Development and Current State*. Edward Elgar Publishing Limited, Cheltenham, UK.

✓ Ahuja H. L. (2019). *Macroeconomics- Theory and Policy*. 20th Edition, S Chand publication.

✓ Dwivedi, D. N. (2018): *Macroeconomics -Theory and Policy*. 5th Edition, Tata McGraw Hill.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	2	2	2	2	2	3
CO2	3	2	1	1	2	2	2	3	3
CO3	3	2	2	2	2	2	3	2	3
CO4	3	2	2	1	2	2	3	3	3



Major Paper 7: Mathematical Methods for Economics I

Course Description

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Course Outcomes:

CO1: To use mathematical techniques in analyzing economic problems

CO2: To get a fair idea about the number system, set theory, and different types of functions.

CO3: Evaluate and use the concept of derivative of functions involving single variables to link the total and marginal concepts in Economics.

CO4: Understand major concepts of Linear Algebra

Unit I: Preliminaries and Functions of One Real Variable

Sets and set operations; Cartesian product; relations; functions and their properties; Number systems. Types of Functions: constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and Continuity of functions; Limit theorems.

Unit II: Derivative of a Function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions.

Unit III: Functions of two or more Independent Variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity.

Unit- IV: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

Text Book:

✓ C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition

Reference Book:

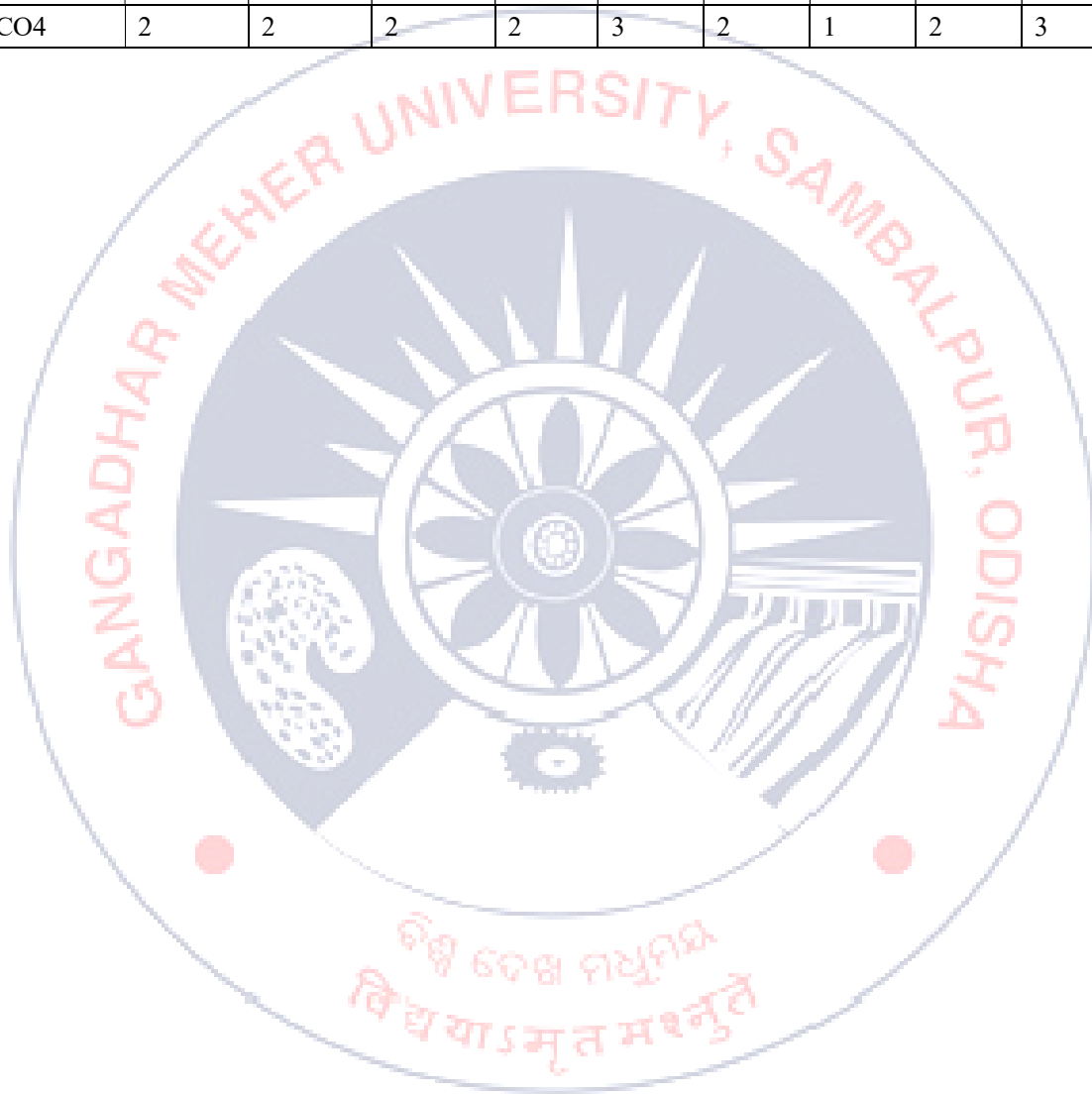
✓ K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia

✓ Edward T Dowling (2004): *Introduction to Mathematical economics*, Tata McGeaw-Hill, Third Edition.

✓ Taro Yamane (1995): *Mathematics for Economists: An elementary survey*. New Delhi Prentice Hall. Second Edition

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3	2	2	2	3
CO2	3	3	1	2	3	2	2	2	3
CO3	3	1	1	1	3	2	1	2	3
CO4	2	2	2	2	3	2	1	2	3



CORE II

Minor 1 Paper 2: Development Economics 1

Course Description:

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Course Outcomes:

CO1: The course will enhance the understanding of concepts of development and the need for it.

CO2: It helps students learn about aggregate models of growth.

CO3: It examines the axiomatic basis for inequality measurement and explores the connections between growth and inequality.

CO4: It familiarizes the students with the socio-economic and political institutions while showing their contribution to economic development.

Unit I: Study of Economic Development

Conceptions of Development economic growth and economic development; Alternative measures of development, documenting the international variations in these measures, comparing development trajectories across nations and within them measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; Happiness Index

Unit II: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Harrod-Domar model, Solow model and convergence with population growth and technical progress.

Unit III: Poverty, Inequality, Agriculture, Industry and Development:

Measuring poverty: Head Count Ratio, Poverty Gap Ratio, Squared Poverty Ratio, FGT Ratio; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Policy options – some basic considerations; Agriculture, Industry and Economic Development: Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

Unit IV: Institutions and Economic Development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

Text book:

✓ *Todaro, Michael P and Stephen C Smith (2006): Economic Development, 8th Edition, Pearson*

Reference Books:

✓ Debraj Ray (2009): *Development Economics*, Oxford University Press.

✓ Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	1	1	3
CO2	3	2	2	3	2	2	1	2	2
CO3	3	2	1	3	2	3	2	2	3
CO4	3	3	2	2	2	1	2	1	2



MULTIDISCIPLINARY MDC 3: Mathematical Finance

Course Objective:

The objective of this course is to learn the mathematical tools used for understanding the financial dynamics and stock exchange with a numerical analysis background.

UNIT-I

Basic principles: Comparison, arbitrage and risk aversion, interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods)

UNIT-II

- Comparison of NPV and IRR. Bonds, bond prices and yields. Floating-rate bonds, immunization.
- Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance and correlation)

UNIT-III

Random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints).

Books Recommended:

- ✓ David G. Luenberger, *Investment Science*, Oxford University Press, Delhi, 1998.
- ✓ John C. Hull, *Options, Futures and Other Derivatives*, 6th Ed., Prentice-Hall India, Indian reprint, 2006.
- ✓ Sheldon Ross, *An Elementary Introduction to Mathematical Finance*, 2nd Ed., Cambridge University Press, USA, 2003.
- ✓ Suggested digital platform: NPTEL/SWAYAM/MOOCs
- ✓ e-Learning Source <http://ndl.iitkgp.ac.in> ; <http://ocw.mit.edu> ; <http://mathforum.org>

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	2	2	1	1	3
CO2	2	2	2	3	2	2	1	2	2
CO3	3	1	2	3	1	3	2	2	3
CO4	1	2	2	2	1	1	2	1	2

Semester IV

IV	Core I	Paper-8	Microeconomics II	04
		Paper-9	Macroeconomics II	04
		Paper-10	Statistical Methods for Economics	04
	Core II	Paper-2	Public Economics I	04
		Community Engagement & Services with Field work/Internship		04
				20

Core I
Major paper 8: Microeconomics II

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers the Market, general equilibrium and welfare, imperfect markets, and topics under information economics.

Course Outcomes:

- To understand short-run and long-run supply decisions of a competitive firm & industry equilibrium
- To have a basic understanding of concepts of Pareto efficiency in consumption & production; general equilibrium, and welfare theorems
- To develop an understanding of imperfect markets such as Oligopoly
- To understand basic concepts of game theory.

Unit I: Firm Supply and Equilibrium

Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent

Unit II: General Equilibrium, Efficiency and Welfare

The Edgeworth Box; Trade; Pareto Efficient Allocations; Existence, Stability and Uniqueness of equilibrium; Walras Law; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems; Production possibilities, comparative advantage and Pareto efficiency

Unit III: Market Imperfections: Monopoly and Monopolistic Competition

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Price Discrimination, Degrees of Price Discrimination, Regulation of Monopoly, Dynamic Views of Monopoly. Monopolistic competition – product differentiation, Selling costs and excess capacity

Unit IV: Oligopoly and Game Theory

Non-collusive oligopoly models: Cournot, Bertrand, Stackelberg, Sweezy, Chamberlin, Collusive oligopoly models: Cartels, Price leadership. The Payoff Matrix of a Game; Nash Equilibrium, Pure and Mixed Strategies, The Prisoner's Dilemma, Repeated Games, Tit-for tat strategy, Enforcing a cartel, Sequential Games, A Game of entry deterrence

Text Book:

- ✓ *H. R. Varian (2010): Intermediate Microeconomics: A Modern Approach, 8th Edition*
- ✓ *W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.*
- ✓ *Koutsoyiannis, A (1979): Modern Microeconomics, 2nd Ed, ELBS/Macmillan*

Reference Book:

- ✓ *C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.*
- ✓ *Robert S. Pindyck and Daniel Rubinfeld: Microeconomics, 8th Edition, Pearson*
- ✓ *H. L. Ahuja (2018): Advanced Economic Theory. Twenty-First Edition, Sultan Chand Publication*

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	2	3	1	1	2	3
CO2	3	1	2	2	3	1	1	2	3
CO3	3	1	2	1	3	1	1	2	3
CO4	3	1	2	2	3	1	1	2	3



Core I
Major paper 9: Macroeconomics II

Course Description

This paper deals with growth models and the classical school of thought, and its evolution into Keynesian economics. The students are introduced to long-run dynamics in growth and technical progress. This paper also familiarizes about the open economy and its dynamics.

Course Outcomes:

- To emphasize on conceptual understanding and some applications of important growth models.
- To enable critical appreciation of the classical school of thought and the evolution of Keynesian economics.
- To understand the theoretical underpinnings of economic policy in open economies, such as monetary and fiscal policy, the basic Mundell-Fleming model, and nominal and real exchange rate determination.
- To understand the trade-off between Unemployment and Inflation; get a critical understanding of Long-run and Short-run Phillips Curve, unemployment, and Expectations.

Unit I: Economic growth model:

Accumulation of capital in the basic Solow model; supply and demand for goods, growth in the capital stock and the steady state, Golden rule level of capital, comparing steady states, transition to the golden rule steady state with too much and too little capital, population growth technological progress – Solow version

Unit II: Classical and Keynesian Macroeconomic thought

Classical macroeconomics, Employment and output determination: Say's law; the quantity theory of money, Keynes General theory: Keynes main propositions, Analysis of the labour market, Keynes critique of Says law and Quantity Theory of Money, the orthodox Keynesian school, underemployment equilibrium in the Keynesian model.

Unit III: Open Economy and Macroeconomic policies

Balance of payments –concepts, meaning of equilibrium and disequilibrium in Balance of payments measures to correct disequilibrium. Determination of foreign exchange rate- the balance of payments theory, fixed versus flexible exchange rate; the short run open economy model: The basic Mundell-Fleming model: Macroeconomic policies – Fiscal policy – Crowding out and Crowding-in; Monetary policy and instruments, the Transmission Mechanism, Effectiveness of macroeconomic policies in the open and closed economies.

Unit IV: Inflation, Unemployment and Expectations

Inflation – Unemployment trade-off and the Phillips curve – short run and long run analysis, Adaptive and Rational expectation hypothesis. The policy ineffectiveness debate. Phillips curve and orthodox Keynesian school. Solow and Tobin's modified Philips curve.

Text Readings:

✓ *Richard T. Froyen (2005): Macroeconomics, 2nd Edition, Pearson Education Asia, New Delhi.*

✓ *N. Gregory Mankiw (2010): Macroeconomics, 7th edition, Cengage Learning India Private Limited, New Delhi.*

Suggested References:

✓ *Levacic R and Rebmman A (1982): Macroeconomics –An introduction to Keynesian – neoclassical controversies*

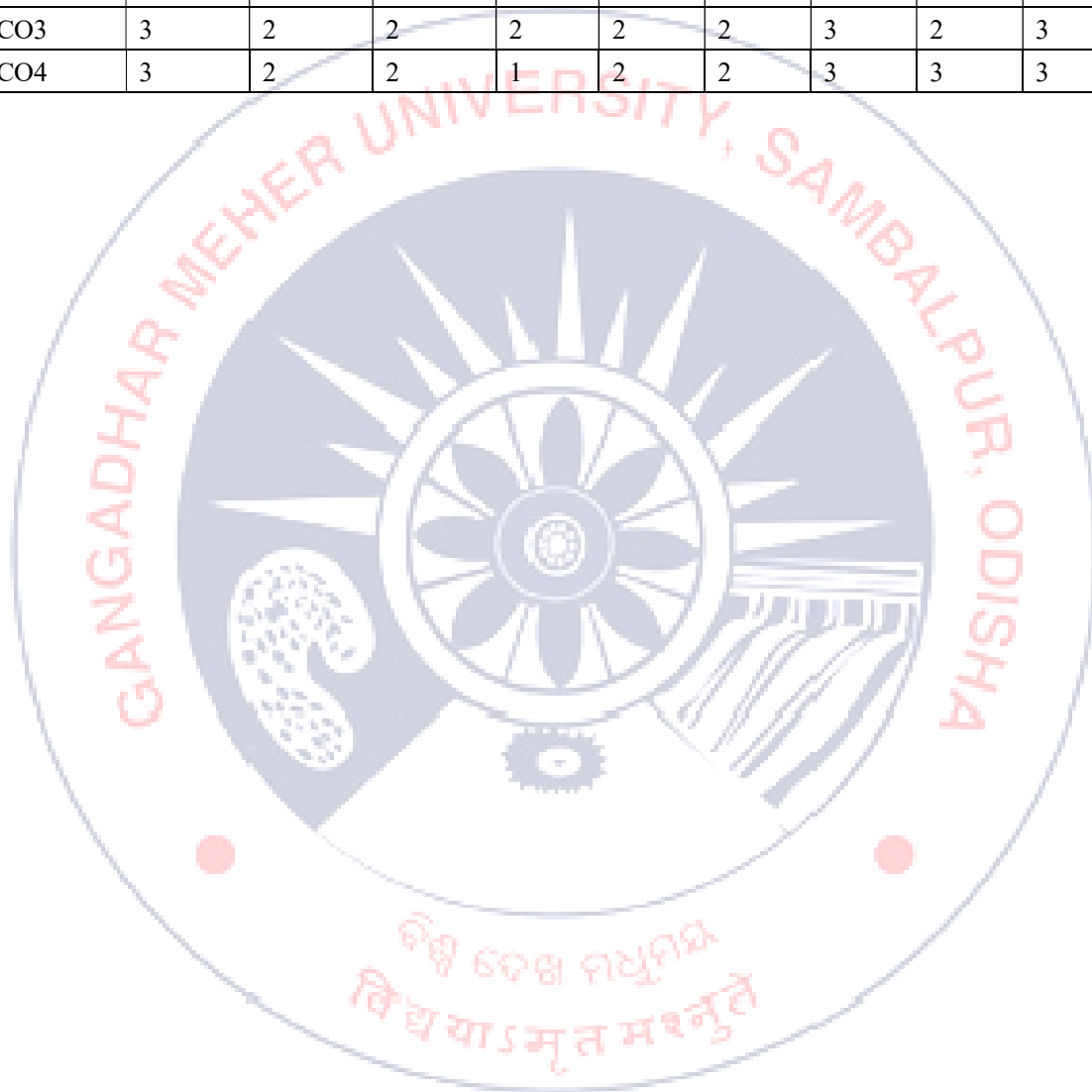
✓ *Edward Shapiro (2001): Macroeconomics Analysis- Galgotia Publication Private Limited, 5th Edition, New Delhi.*

✓ Dwivedi, D. N. (2018): *Macroeconomics -Theory and Policy*. 5th Edition, Tata McGraw Hill.

✓ Blanchard, O. (2013): *Macroeconomics*. 7th edition, Pearson Edn

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	2	2	2	2	2	3
CO2	3	2	1	1	2	2	2	3	3
CO3	3	2	2	2	2	2	3	2	3
CO4	3	2	2	1	2	2	3	3	3



Core 1
Major paper 10: Statistical Methods for Economics

Course Description:

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of the relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables, and introduces the most frequently used theoretical distribution, the Normal distribution.

Course Outcomes:

- To summarize data effectively using measures of central tendency, dispersion, and graphical techniques.
- To analyze relationships between variables through correlation and regression analysis.
- To understand and interpret time series data by identifying trends and seasonality.
- To apply probability theory and sampling techniques to solve statistical problems and assess data validity.

Unit I: Data Collection and Measures of Central Tendency and Dispersion

Basic concepts: population and sample, parameter and statistics; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits, and demerits; Measures of skewness and kurtosis.

Unit II: Correlation and Regression Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient. Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate.

Unit III: Time Series and Index Number

Time Series: definition and components, measurement of the trend- freehand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of the seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyres's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

Unit IV: Probability Theory and Sampling

Probability: Basic concepts, addition, and multiplication rules, conditional probability; Meaning of Sampling, Types of Sampling: Probability Sampling versus Non-Probability Sampling; Simple Random Sampling and its selection, Systematic Sampling, Multi-stage Sampling, Quota Sampling; Error: Sampling and Non-sampling..

Basic Readings and Textbooks:

✓ S. C. Gupta (2017): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi

Reference Book:

✓ Murray R. Spiegel (2017): *Theory & Problems of Statistics*, Schaum's publishing Series.

✓ A L Nagar & R K Das (1983): *Basic Statistics*. Oxford University Press.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3	2	2	2	3
CO2	3	3	1	2	3	2	2	2	3
CO3	3	1	1	1	3	2	1	2	3
CO4	2	2	2	2	3	2	1	2	3



CORE II

Minor II Paper 2: Public Economics I

Course description:

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Course Outcomes:

- The course will familiarize the students with the relevance, responsibilities, and sources of receipts of the government.
- Students will be able to understand the rationale behind the public provision of specific goods and services and what can be left to market for provision.
- Students will be able to understand the normative ideas behind public expenditure, taxation, and public debt as well as the budget of government and its impact on the economy.
- Students will be able to understand the methods of fiscal management by the government in India.

Unit I: Introduction to Public Finance and Public Budgets

The concept of Pareto Optimality. Pareto improvement and potential Pareto improvement. Public good versus private good; Free riding and public good provision. Maximum Social advantage. Market failure and role of government; Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy

Unit II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner 's law of increasing state activities, Peacock-Wiseman hypotheses. Pareto Optimality Criterion, social Allocation

Unit III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India, Introduction of GST in India. Issues and Challenges relating to GST.

Unit IV: Public Debt

Sources, effects, debt burden – Classical/ Ricardian views, Keynesian and post-Keynesian views; shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt.

Text Books:

- ✓ J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.

Reference Book:

- ✓ R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
- ✓ Bhatia H L (2018): *Public Finance*. Vikas Publishing House.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Community Engagement & Services with Field work/Internship

This will be a 4- credit course.

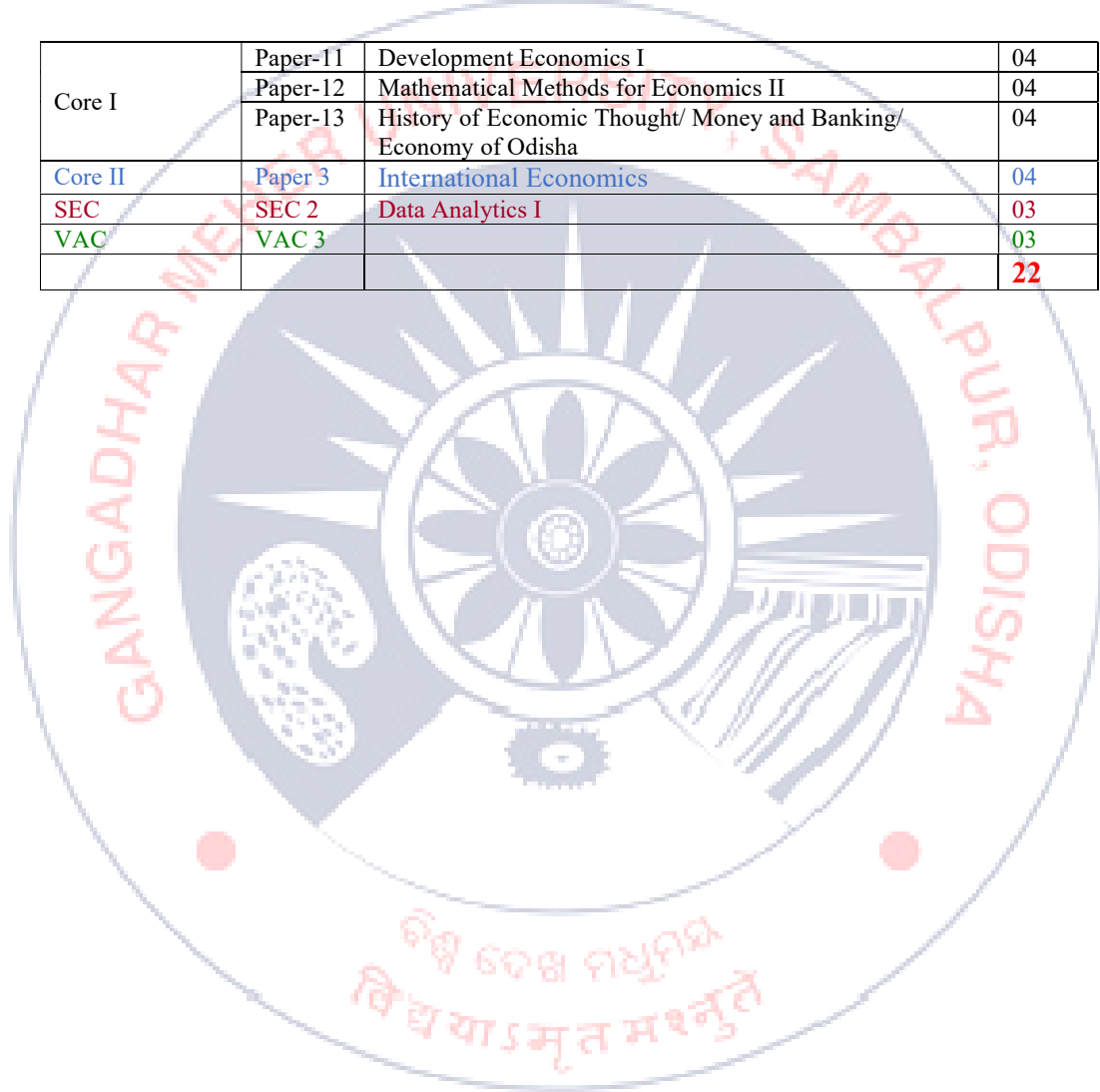
-A report must be prepared by the students for the Community Engagement & Services with fieldwork.

-A student may be allowed for Internship with proper approval following necessary SOPs. A report of the Internship must be submitted at the School for evaluation.



Semester V

Core I	Paper-11	Development Economics I	04
	Paper-12	Mathematical Methods for Economics II	04
	Paper-13	History of Economic Thought/ Money and Banking/ Economy of Odisha	04
Core II	Paper 3	International Economics	04
SEC	SEC 2	Data Analytics I	03
VAC	VAC 3		03
			22



Core 1

Major paper 11: Development Economics I

Course Description:

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Course Outcomes:

- The course will enhance the understanding of concepts of development and the need for it.
- It helps students learn about aggregate models of growth.
- It examines the axiomatic basis for inequality measurement and explores the connections between growth and inequality.
- It familiarizes the students with the socio-economic and political institutions while showing their contribution to economic development.

Unit I: Study of Economic Development

Conceptions of Development economic growth and economic development; Alternative measures of development, documenting the international variations in these measures, comparing development trajectories across nations and within them measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; Happiness Index

Unit II: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Harrod-Domar model, Solow model and convergence with population growth and technical progress.

Unit III: Poverty, Inequality, Agriculture, Industry and Development:

Measuring poverty: Head Count Ratio, Poverty Gap Ratio, Squared Poverty Ratio, FGT Ratio; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Policy options – some basic considerations Agriculture, Industry and Economic Development: Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

Unit IV: Institutions and Economic Development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

Text book:

✓ *Todaro, Michael P and Stephen C Smith (2006): Economic Development, 8th Edition, Pearson*

Reference Books:

✓ Debraj Ray (2009): *Development Economics*, Oxford University Press.

✓ Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Core 1

Major paper 12: Mathematical Methods for Economics II

Course Description:

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Course Outcomes:

- To use mathematical techniques to analyze economic problems.
- To have an understanding of the input-output models.
- To be able to use second and higher-order derivatives and integration to analyze the nature of functions.
- To develop the ability to optimise objective functions subject to satisfaction of constraints.

Unit I: Linear models:

Input-Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; Solution for equilibrium output in a three-industry model; The closed model.

Unit II: Second and Higher Order Derivatives and Integration:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection, Derivative of Implicit Function; Higher Order Partial Derivative. Indefinite Integrals; Rules of Integration; Techniques of Integration: Substitution Rule, Integration by parts, and Partial Fractions; Definite Integral – Area Interpretation.

Unit III: Single and Multivariable Optimization:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions - First and Second derivative tests (using Hessian Determinants); Economic applications thereof, First and second order condition for extrema of multivariable functions; Convex functions and convex sets.

Unit IV: Optimization with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable Single constraint case only); First and second order condition; The Bordered Hessian determinant.

Text Reading:

✓ *A. C. Chiang and K. Wainwright (2005): Fundamental Methods of Mathematical Economics, McGraw Hill International Edition.*

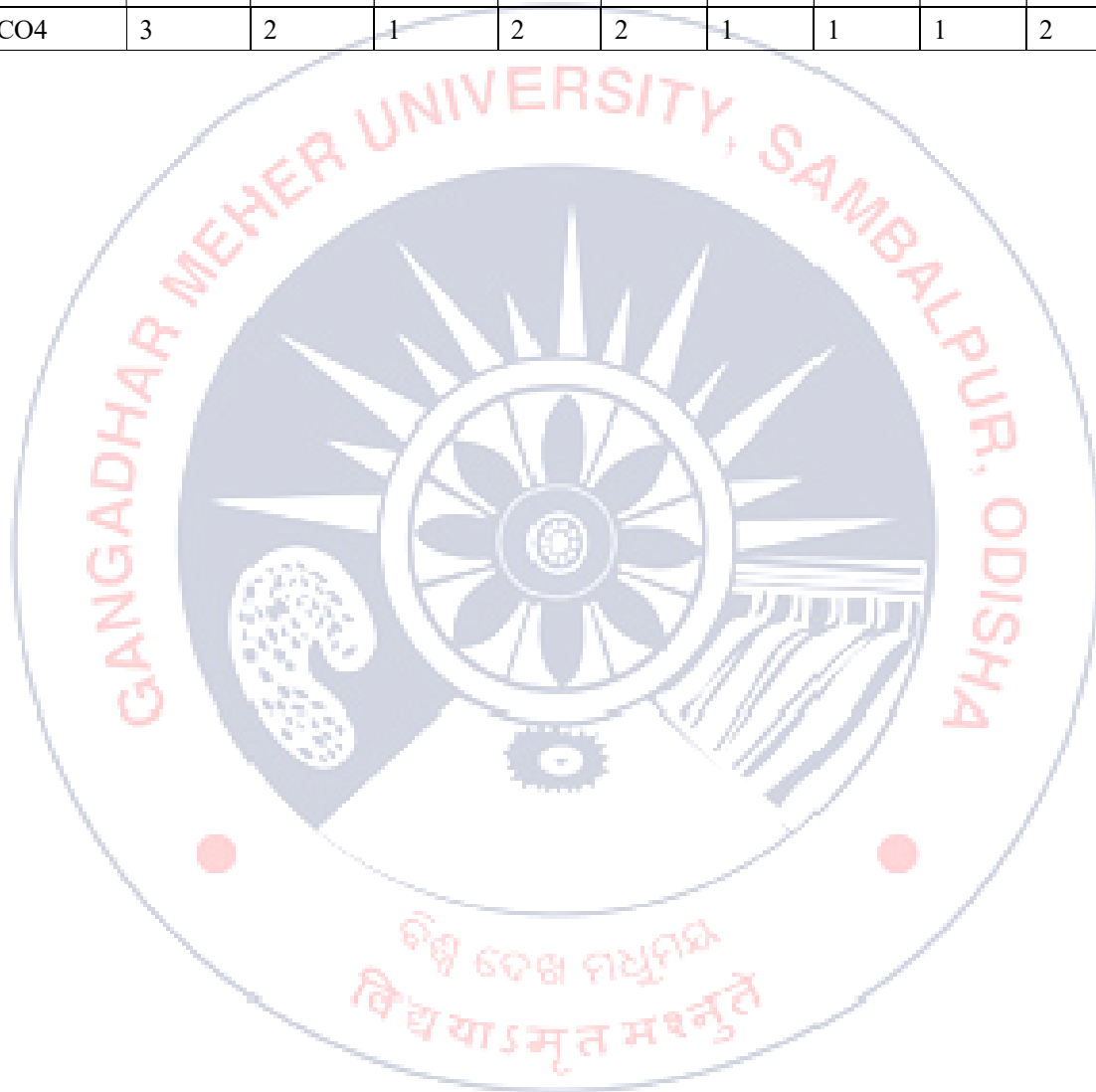
Reference Book:

✓ *K. Sydsaeter and P. J. Hammond (2002): Mathematics for Economic Analysis. Pearson Educational Asia*

✓ *Edward T Dowling (2004): Introduction to Mathematical economics, Tata McGeaw-Hill, Third Edition.*

✓ Taro Yamane (1995): *Mathematics for Economists: An elementary survey*. New Delhi Prentice Hall. Second Edition.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Core 1

Major paper 13: History of Economic Thought

Course description

This course provides a perspective to our intellectual history, development of economic thought and helps relate this to the current thinking. It introduces the students to the philosophers and economists who developed economic reasoning and modeling of economic activities. It also helps create critical abilities and attitudes.

Course Outcomes:

- Understanding economic theories from Mercantilism to the Classical Economists of the eighteenth century and allowing the study of particular economic ideas and theories in considerable depth.
- To facilitate an understanding of economics effectively and comparing different theories of economists from the classical to Marxism.
- Exploring the contrasting theoretical approaches of different economists.
- Understanding the historical evolution of Indian economic thought and its comparison with Western economic thought.

Unit I: Introduction and Early Economic Thought

Mercantilism-main characteristics, Thomas Mur's views; Physiocracy- main features, Tableau Economique, taxation; Early Classicism: Adam Smith- Theory of Value, Division of labour, capital accumulation, distribution, views on trade and economic progress; David Ricardo-theory of value, theory of rent, distribution, ideas on international trade and development.

Unit II: Classicism Vs Marxism

Thomas Malthus- population theory, glut theory; Karl Marx-dynamic of social change, theory of value, surplus value, theory of profit, crisis of capitalism, Johns Stuart Mill- ideas on value, distribution, views as a synthesizer.

Unit III: The Marginalists' Revolution

Economic ideas of Jevons, Walras and Menger, Bohm-Bowerk, Wicksell; Marshall – Role of time element in price determination, ideas on consumer surplus, Marshal as a synthesizer.

Unit IV: Indian Economic Thought

Main themes of Kautilya's Arthasashtra; Modern Economic Ideas: Dada Bhai Naoroji, M.K. Gandhi, village swaraj, non-violence, machines and labour, cottage industries; Comparison of Indian Economic thought with western Economic thought.

Text Books

✓ Gide, Charles and Rist, Charles (1973): *A History of Economic Doctrines*, Oxford University Press.

✓ Dasgupta, A K (1986): *Epochs of Economic Theory*, Oxford University Press, New Delhi.

Reference Book:

✓ O'Brien, D P (1975): *Classical Economists*, Oxford, Clarendon Press.

✓ Ekelund, Robert B. and Robert F. Hebert (1990): *A History of Economic Theory and Method*, third edition, New York: McGraw Hill.

✓ Henry W. Spiegel (1991): *The Growth of Economic Thought*, 3rd ed. Durham: Duke University Press

✓ Tom Bottomore (1980): *Dictionary of Marxist Thought*, Basic Blackwell Publishers.

✓ Roll, Eric, *History of Economic Thought*, Faber and Faber Ltd.

✓ L N Rangarajan (1992): *Kautilya: The Arthasastra*, edited, rearranged, translated and introduced; Penguin Books, New Delhi.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Or Money and Banking

Course Description

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

Course Outcomes:

- Understanding money and its types along with their functions and different measures of money supply.
- Understanding the basic concepts of banking, and its functions and to examine the banking scenario in India.
- To gain knowledge of the functions of central banks and monetary policies and how they have evolved.
- Get an understanding of the conceptual framework of the financial market and institutions of India.

Unit I: Money

Definition and functions of money; Types of money: legal tender money and bank money, near money; Value of money and index number; construction of index number; WPI, CPI, PPI, GDP deflator, Cost of living index. Demand for money- Classical and Keynesian approaches, Patinkin and the Real Balance Effect; Friedman's Quantity theory of money. Supply of Money- Measures of money supply: M_1 , M_2 , M_3 and M_4 ; High powered money and money multiplier.

Unit II: Commercial Banking

Meaning and types; Functions of commercial banks; the process of credit creation and its limitations; Balance sheet and portfolio management, Banking sector reforms in India; Lessons from Global Financial Crisis and Policy Response in India.

Unit III: Central Banking

Functions of a central bank; Quantitative and qualitative methods of credit control; Central Bank's Supervision and prudential measures for financial stability; current monetary policy of India, liquidity adjustment facility (LAF) through Repo and reverse repo operation, MSF.

Unit IV: Financial Markets

Financial Market, Meaning, Types, Money market and Capital Market, Primary and Secondary Market, Stock Exchanges, SEBI; Role of Financial Markets for Economic Development. Financial Instruments: Government securities, derivatives, futures and options, bond, debentures.

Text Book

- ✓ Bhole, L. M. (2017): *Financial institutions and Market*, 6th Ed, Tata McGraw hill, New Delhi.
- ✓ Mishkin, F. S. & Eakins S. G (2017): *Financial Market and Institutions*, 8th Ed, PE, New Delhi.

Reference Book

- ✓ Suraj. B. Gupta (2010): *Monetary Economics: Institution, Theory and Practice*, S. Chand.
- ✓ Gorden & Natrajan (2023): *Financial Market and institutions*, 3rd Ed, Himalaya Publishing House

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Or Economy of Odisha

Course description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in Odisha in pre- and post-Independence period, with particular emphasis of paradigm shifts and turning points. Given the rapid changes taking place in Odisha, the reading list will have to be updated annually.

Course Outcomes:

- To obtain a basic overview of the economy of Odisha in the pre-Independence period.
- To analyze the strengths and weaknesses of the macroeconomic scenario of Odisha's economy.
- To gain an understanding of the important economic sectors of Odisha and the challenges faced by them in recent times.
- To grasp the current economic problems in Odisha.

Unit I: Odisha Economy before 1947

Orissa's Economy in the Nineteenth Century: Benevolence or Exploitation, Forces of Nature, Animal Power, The Company Steps in, Public Works and Public Health, Education, Disintegration of Village Economy, New Social Environment, Changing Position of Social Classes, The Moneylenders, The Borrowers, Money-flows from Village to Metropolis, Pauperization of Peasantry, The Wage Earners, Demographic Changes, Profiting from Rural Adversity; Diarchy in 1919 and Separation of Provincial Finances from Central Government in 1937; Emergence of Federal Finance.

Unit II: Macro Economy of Odisha

A macro glance of Odisha economy: aggregate income, broad sectoral decomposition, performance of districts, employment, child labour and bonded labour, employment programmes, consumption expenditure, cost of living; Odisha State public finances.

Unit III: Agriculture, Industry, Infrastructure and Environment in Odisha

Agriculture: land ownership and land tenure, agricultural wages and rural unemployment, production and productivity of major crops, agricultural inputs, agricultural policy; Animal Husbandry; Fisheries Industry: Investment, industrial policy, and the growth of large industries, mining and quarrying; Construction; tertiary sector: tourism, transport and power; Water Resources, Forest Resources

Unit IV: Social Sector in Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health, NRHM; education: Literacy, Primary education, secondary education, higher education, SSA; human development

Text Readings

✓ Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): *The Economy of Odisha: A Profile*, Oxford University Press, New Delhi

✓ GoO (latest): *Economic Survey, Planning and Coordination Directorate of Economic and Statistics, Bhubaneswar*

Additional Reading

1. GoO (2004): *Human Development Report 2004 Orissa*, Planning and Coordination Department, GoO, Bhubaneswar

2. Mahapatro, S. B. (1980): Inter-Industry Wage Differentials in Orissa: An Empirical Analysis, *Indian Journal of Industrial Relations*, 15(4): 525-536.

3. Vyasulu, V. and Arun, A. V. (1997): Industrialisation in Orissa: Trends and Structure, *Economic and Political Weekly*, 32(22): M46-M53.
4. Das, Binod S. (1976): Orissa's Economy in the Nineteenth Century, *Social Scientist*, 4(11): 32-46.
5. Das, Binod S. (1976): Orissa's Economy in the Nineteenth Century: Part Two, *Social Scientist*, 4(12): 38-50.
6. Mohanti, K. K. and Padhi, S. (1995): Employment Situation of Tribal Population in Orissa: 1981 Census Data, *Economic and Political Weekly*, 30 (29): 1879-1882.
7. Nair, K. R. G. (1993): New Economic Policy and Development of Backward Regions: A Note on Orissa, *Economic and Political Weekly*, 28(19): 939-941.
8. Mohanty, B. (1993): Orissa Famine of 1866: Demographic and Economic Consequences, *Economic and Political Weekly*, 28(1/2): 55-66.
9. Haan, A. de and Dubey, A. (2005): Poverty, Disparities, or the Development of Underdevelopment in Orissa, *Economic and Political Weekly*, 40(22/23): 2321-2329.
10. Samal, K. C. (1998): Poverty Alleviation after Post-Liberalisation: Study of a Tribal Block in Orissa, *Economic and Political Weekly*, 33(28): 1846-1851
11. Nayak, P. and Chatterjee, B. (1986): Disguised Unemployment in Agriculture: A Case Study of Rural Orissa, *Indian Journal of Industrial Relations*, 21(3): 310-334.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3		PSO4	PSO5
CO1	3	2	1	1	2	1	1		1	3
CO2	3	2	1	1	2	1	1		1	3
CO3	3	1	1	2	2	1	1		1	2
CO4	3	2	1	2	2	1	1		1	2

Core 2

Minor paper 3: International Economics

Course Description

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course also develops insight into the international financial system and the trade policy of India.

Course Outcomes:

- To understand the basic concepts/principles of International Trade and Finance.
- To acquire the ability to analyse the concepts to understand specific case studies and practical issues.
- To develop insights into trade policy and balance of payments.
- To develop an insight into the international financial system and the trade policy of India.

Unit I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Theories of Trade-absolute advantage (Adam Smith), comparative advantage (David Ricardo) and Opportunity cost (Haberler); Heckscher-Ohlin theory of trade – assumptions (Irreversible Factor intensity of goods, Perfect competition with homogeneous products, Constant returns to scale, equal access to technology to producers of all countries, difference in factor endowment between the countries), factor abundance, factor intensity and limitations (Leontief Paradox); Factor Price Equalization theorem.

Unit II: Trade Policy

Concepts of terms of trade; Doctrine of reciprocal demand – Offer curve technique; Gains from trade, types; Free Trade vs Protected Trade, Tariffs- types, effects under partial and general equilibrium analysis; Quotas- effects its impact in partial equilibrium analysis; General Equilibrium analysis of tariff; the concept of optimum tariff.

Unit III: Exchange Rate and International monetary system

Concept and Types of Exchange Rate (bilateral vs. trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Mint Parity Theory, Purchasing-Power Parity Theory, Fixed versus Flexible exchange rate; IMF: Objectives of IMF, IMF's assistance to member countries (Rapid Financing Instrument, Rapid Credit Facility Stand only) for BoP deficit correction., World Bank and WTO; Their achievements and failures; Their Role from the point of view of India

Unit IV: Balance of Payments

Concepts and components of balance of trade and balance of payments; deficit and surplus in the balance of payments, Disequilibrium in balance of payments; Various measures to correct deficit in BOPs (Expenditure switching and expenditure reducing policies, Direct control), Depreciation Vs. Devaluation; Elasticity approach to devaluation, Foreign trade multiplier.

Text Book:

✓ Mannur H. G (2018), *International Economics*, Vikash Publishing/Sultan Chand

Reference Books:

✓ Salvatore Dominick (2016), *International Economics*, Wiley India.

✓ Sodersten Bo and Reed J (1994), *International Economics*, McMillan Publisher

✓ Dwivedi D. N. (2013), *International Economics: Theory and Policy*, Vikash Publishing.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3		PSO4	PSO5
CO1	3	2	1	1	2	1	1		1	3
CO2	3	2	1	1	2	1	1		1	3
CO3	3	1	1	2	2	1	1		1	2
CO4	3	2	1	2	2	1	1		1	2



SEC-2

Data Analytics-1

Course description

This paper helps students to learn the fundamental elements of Data Analytics and to gain proficiency in working with SPSS. Upon Completing the Course, students will be able to identify advanced techniques of data analytics using Statistical Package for Social Sciences (SPSS), use Exploratory data analysis to visualize the data, analyses survey and other data sets using statistical methods

Course Outcomes:

- This course is designed to help students learn fundamental elements of Data Analytics and to gain proficiency in working with SPSS.
- Upon Completing the Course, students will be able to identify advanced techniques of data analytics using Statistical Package for Social Sciences (SPSS) software.
- They will be exposed to exploratory data analysis techniques.
- This course shall enable them to use statistical tools to visualize and analyze surveys and other data sets.

Unit I: Introduction to Data Analytics

Concept of data analytics; Role of data analyst; Classification of Data- Structured, Semi-Structured, Unstructured data; Scale of measurement of data; Various Data sources, Modern Data collection Methods

Unit II: Data Visualisation and Basic Statistics

Data presentation and visualization, Types of Diagrams; Descriptive statistics like measure of central tendency, Dispersion, Skewness, Correlation etc.; Univariate, Bivariate, Multivariate analysis

Unit III: Introduction to SPSS

Different Menu's in SPSS, creating a data file, opening excel files, variables and labels, selecting cases by filtering, recoding of data, merging of files, Sorting of Cases and Variable, SPSS Output and its transfer to excel and word.

Unit IV: Exploratory Data Analysis using SPSS

Data visualization using frequency tables and charts, descriptive statistics, cross tabulations, Compare-Means, ANOVA, Independent Sample t-test, Paired Sample t-test, One-way ANOVA, chi square tests. Simple and Partial correlation; General Linear Model

Text Books

- ✓ Brian C. Cronk (2018), *How to use SPSS: A Step-By-Step Guide to Analysis and Interpretation*, Tenth edition, Routledge.
- ✓ Nancy L. Leech et. al. (2005), *SPSS for Intermediate Statistics: Use and Interpretation*, Second edition, Lawrence Erlbaum Associates, Inc.

Additional Reading

- ✓ William E. Wagner (2015), *Using IBM SPSS statistics for research methods and social science statistics*, Fifth edition, SAGE Publications, Inc.
- ✓ IBM 2016, IBM Knowledge Center: SPSS Statistics, IBM, viewed 18 May 2016, <https://www.ibm.com/support/knowledgecenter/SSLVMB/welcome/2>.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3		PSO4	PSO5
CO1	3	2	1	1	2	1	1		1	3
CO2	3	2	1	1	2	1	1		1	3
CO3	3	1	1	2	2	1	1		1	2
CO4	3	2	1	2	2	1	1		1	2



Semester VI

Core I	Paper-14	Introductory Econometrics /Public Economics I /Development Economics II	04
	Paper 15	Computational Methods in Economics/ Environmental Economics / International Economics	04
Core III	Paper 3	Money and Banking	04
SEC	SEC 3	Data Analytics II	03
VAC	VAC 4		03
			18

Core 1

Major paper 14: Introductory Econometrics

Course Description:

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Course Outcomes:

- To have a comprehensive introduction to basic econometric concepts and techniques.
- To gain an understanding of the statistical concepts of hypothesis testing, estimation, and diagnostic testing of simple and multiple regression models.
- To gain knowledge about the consequences, tests, and remedies of violation of Least Square Assumptions.

Unit I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Binomial, Poisson and Normal distributions: their properties. Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation.

Unit II: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test; Test statistics: z, chi square, t and F.

Unit III: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and covariance between Least square estimates; BLUE properties; Standard errors of estimates; Coefficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting. Introduction to multiple regression models.

Unit IV: Violation of Classical Assumptions

Heteroscedasticity, Multicollinearity and Auto-correlation: Meaning, consequences, tests and remedies.

Text Book:

✓ Gujarati, D & Sangeetha (2007); —Basic Econometrics, McGraw Hill Book Co.

Reference Book:

✓ Wooldridge, J. M. (2022): Introductory Econometrics: A modern Approach, 7th Ed, Cengage Publication

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2

Or

Public Economics I

Course description:

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Course Outcomes:

- The course will familiarize the students with the relevance, responsibilities, and sources of receipts of the government.
- Students will be able to understand the rationale behind the public provision of specific goods and services and what can be left to market for provision.
- Students will be able to understand the normative ideas behind public expenditure, taxation, and public debt as well as the budget of government and its impact on the economy.
- Students will be able to understand the methods of fiscal management by the government in India.

Unit I: Introduction to Public Finance and Public Budgets

The concept of Pareto Optimality. Pareto improvement and potential Pareto improvement. Public good versus private good; Free riding and public Good provision. Maximum Social advantage. Market failure and role of government; Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy

Unit II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses. Pareto Optimality Criterion, social Allocation

Unit III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India, Introduction of GST in India. Issues and Challenges relating to GST.

Unit IV: Public Debt

Sources, effects, debt burden – Classical/ Ricardian views, Keynesian and post-Keynesian views; shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt.

Text Books:

- ✓ J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.

Reference Book:

- ✓ R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
- ✓ Bhatia H L (2018): *Public Finance*. Vikas Publishing House.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Or Development Economics II

Course Description:

This is the second Module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Course Outcomes:

- This course shall provide an introduction to basic demographic concepts and their evolution during the process of development.
- It will instil the ability to present a new interpretation of the dualistic structure of an economy and its implication for economic development.
- The course will give an in-depth understanding of environmental economics and application of economic principles to resolve specific environmental problems and issues.
- It will equip the students with an ability to explain the phenomenon of globalization, the economics, and the politics of international agreements, trade, and production patterns.

Unit I: Population and Development

Demographic concepts: birth and death rates, age structure, fertility and its determinants, the Malthusian population trap and the microeconomic household theory of fertility; costs and benefits of population growth and the model of low-level equilibrium trap; rural-urban migration– the Harris Todaro migration model and policy implications.

Unit II: Dualism and Economic Development

Dualism – geographic, social and technological; the theory of cumulative causation (Myrdal); the regional inequalities in the context of economic development; the inverted U relationship; international inequality and the centre periphery thesis; dependency, exploitation and unequal exchange; the dualistic development thesis and its implications.

Unit III: Environment and Development

Basic issues of environment and development – Development and environment inter-linkage; Poverty, environmental degradation and externalities; common property resources, renewable and non-renewable resources; concept of sustainable development; basics of climate change.

Unit IV: International Trade and Economic Development and Financing Economic Development

Trade and economic development; export-led growth; terms of trade and economic growth – the Prebisch Singer Hypothesis; trade strategies for development – import substitution vs. export promotion; international commodity agreements; trade vs aid; Foreign finance, investment and foreign aid – controversies and support Modalities.

Text Book:

✓ *Todaro, Michael P and Stephen C Smith (2006): Economic Development, 8th Edition, Pearson*

Reference Book:

✓ *Thirlwall, A P (2011): Economics of Development, 9th Edition, Palgrave Macmillan.*

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Core 1

Major paper 15: Computational Methods in Economics

Course Description

This course introduces the students to understand uses of computers and their applications in economics. After completion of the course, students will develop professional competency in working with MS Office.

Course Outcomes:

- To understand the uses of computers and their applications in Economics.
- To develop professional competency in working with MS Office.
- To get hands-on use of Microsoft Office applications- Word, Excel, PowerPoint, and Access.
- To gain basic soft skills in handling data, creation, and formatting of Word documents, and making presentations.

Unit I: Computer Fundamentals

The basic architecture of CPU and its functions – Input device and output device – Primary and secondary memory. Operating systems - concept and types, Windows- concepts and components; Basics of a computer network: LAN, WAN, and MAN; Introduction to internet and its applications; booting process, Machine language, and assembly language; Applications of computer in Economics, other fields.

Unit II: MS Word, PowerPoint, and Access Applications

MS Word: Word basics, creation of a document, use of tables, pictures, and charts; editing, formatting, and printing documents; MS PowerPoint: Features, Creation of Slides for presentation, Types of view, Slide master, Templates and Slide transition; MS-Access: Data Field, Record, Database file, Types of files, Types of records, Data type, Database evolution, Data transfer from Excel to Access

Unit III: Worksheet & MS Excel

Basics of worksheet –creating a worksheet, entering data into a worksheet, sorting data, autofill, saving & protecting a worksheet, Formatting of a worksheet. Previewing & Printing worksheet; Create an Excel chart; Drawing charts: Area, Bar, Column, Line, Pie, Scatter, etc. Move and Resize your chart; Charts Styles and Layouts; Chart Titles and Series Titles; Format chart Panel; Add labels to a Chart; Format chart segments; Format Axis titles; Format your Axis titles

Unit IV: MS-Excel Basic Function

Basic calculations: Sum, Sqrt, Max, Min, Count, Averages, Rank; Conditional and logical functions: IF, AND, OR; Estimation of correlation and regression; Hypothesis testing: t-test, F-test and Z-test Excel Pivot Tables; The LOOKUP Function; The VLOOKUP Function in Excel; Hyperlinks in Excel

Text Books:

✓ *New Perspectives Microsoft Office Excel 2016, Comprehensive Enhanced Edition*, by Parsons, et al, Nelson Publisher.

✓ *Sinha, P. K. (2004): Computer Fundamentals, 6th Ed, BPB Publications, New Delhi.*

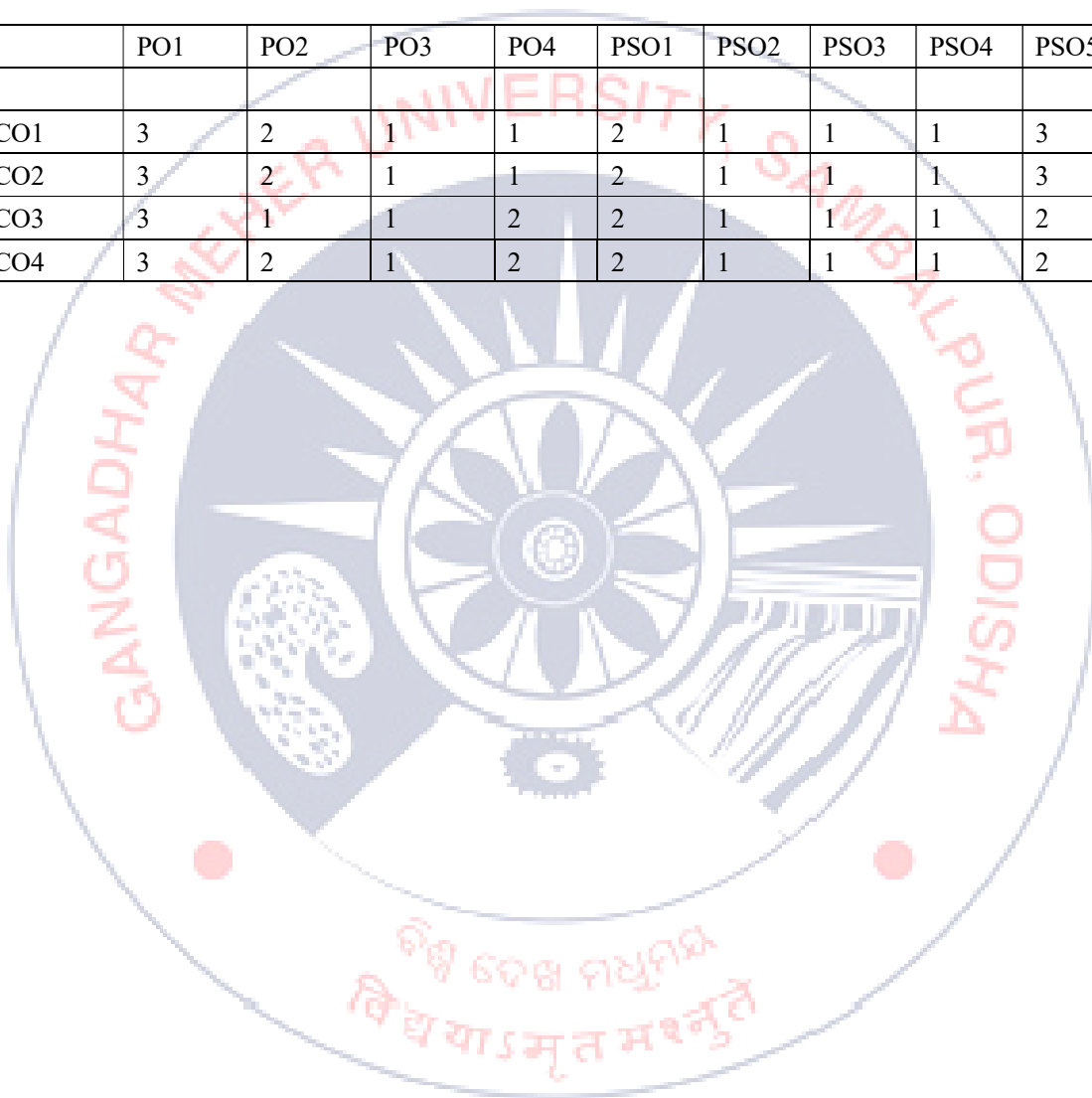
Reference Book

✓ *Raja Raman.V. (2014): Fundamentals of Computers, 6th Ed, PHI, New Delhi.*

✓ *Kerns R. L.(1992): Essentials of Microsoft Windows, Word and Excel, PHI.*

✓ *Alexis Leon & Mathews Leon: Introduction to Computers with Ms-Office, TMH.*

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Or Environmental Economics

Course Description

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Course Outcomes:

- To understand the basic concepts/principles of Environmental Economics
- To be able to analyse and apply the concepts to understand specific case studies.
- To develop insights into the valuation of the environment.
- To become capable to execute/create the Project or field assignment as per the knowledge gained in the course.

Unit I: Economy and Environment

Concepts of Environmental Economics, Natural Resource Economics, and Ecological Economics. Important environmental Problems (Air pollution, water pollution, deforestation, climate change and global warming), Economy-Environment inter-linkages, Role of environment for economic development, Effect of economic development (industrialization, urbanisation, modernization of agriculture) on environment, Consequences of environmental degradation on the economy and the wellbeing of the people and other living beings, concept of Environment-Kuznets Curve hypothesis.

Unit II: The Economics of Pollution and Climate change

Environment and Market Failure, Nature of environment quality (Non-rivalry and non excludability), Pollution as public bad, Pollution as negative externality. Pigouvian tax for optimal pollution, Property rights and bargaining for optimal pollution (Coase Theorem), Government's Command and Control method for controlling pollution. Climate change as market failure (Green house gas externality, lack of incentives for developing low carbon technology), policy measures for mitigations of climate change (carbon taxes and tradable carbon rights).

Unit III: Valuation of Environment

Difficulties of valuation of eco-system services, Concepts of Economic value of environment (Use and non- use value, Option value, Existence value); Willingness to pay (WTP) and willingness to accept (WTA) compensation for improvement/deterioration of environment quality, Revealed Preference Method of valuation of environment (The hedonic price approach, Travel Cost approach) Contingent Valuation method.

Unit IV: Natural Resources and Sustainable Development

Natural resources; renewable and exhaustible; management of exhaustible resources and the Hotelling's rule; management of renewable resources (case of fishery only) optimally, Concept of carrying capacity of Environment (related to resource use and pollution), Issues of irreversibility, uncertainty in the natural resource use and waste disposal, Sustainable Development: Concepts and Components (Social, Economic and Environmental), Daly's operational principles for sustainability, Sustainable Development Goals (SDGs).

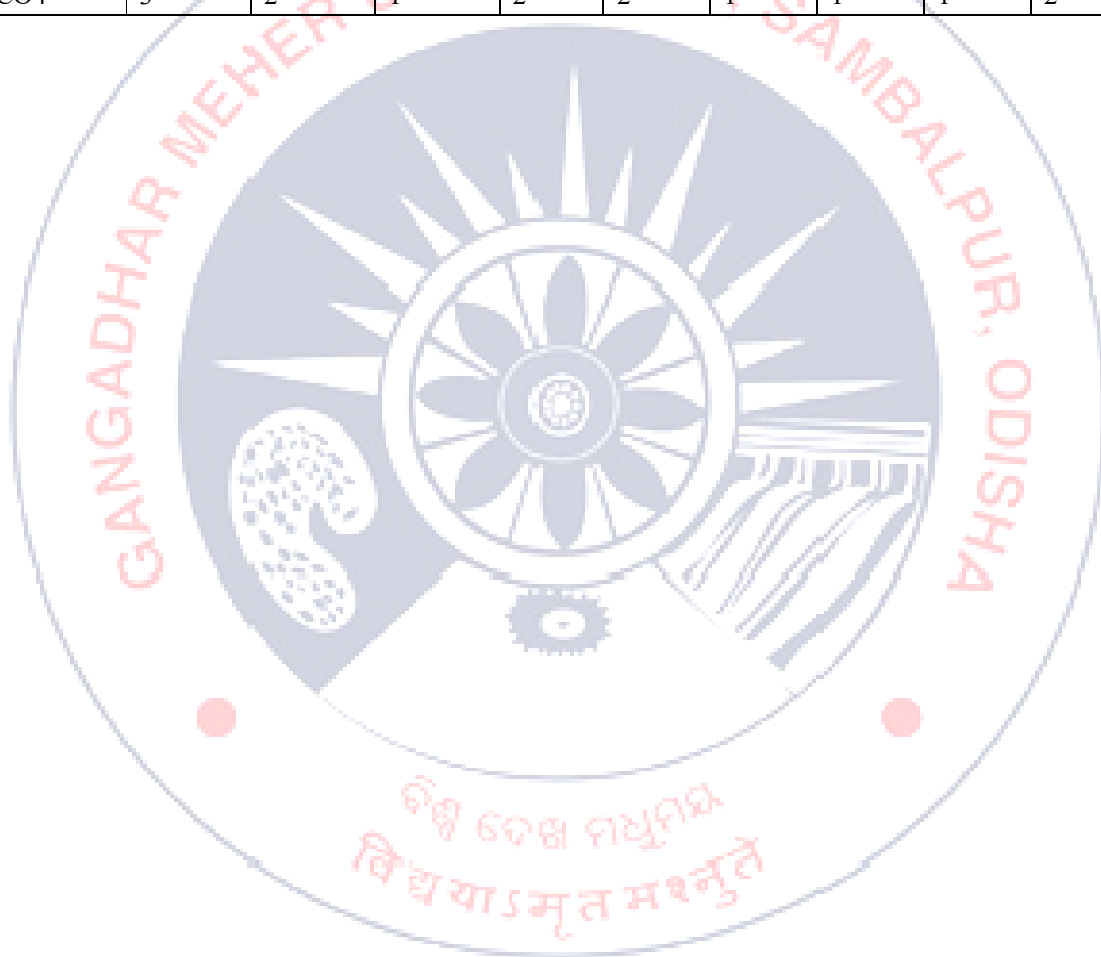
Text Book:

✓ *Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi*

Reference Book:

✓ *Kolstad, C.D (1999): Environmental Economics. Oxford University Press, New Delhi*

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Or International Economics

Course Description

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course also develops insight into the international financial system and the trade policy of India.

Course Outcomes:

- To understand the basic concepts/principles of International Trade and Finance.
- To acquire the ability to analyse the concepts to understand specific case studies and practical issues.
- To develop insights into trade policy and balance of payments.
- To develop an insight into the international financial system and the trade policy of India.

Unit I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Theories of Trade-absolute advantage (Adam Smith), comparative advantage (David Ricardo) and Opportunity cost (Haberler); Heckscher-Ohlin theory of trade – assumptions (Irreversible Factor intensity of goods, Perfect competition with homogeneous products, Constant returns to scale, equal access to technology to producers of all countries, difference in factor endowment between the countries), factor abundance, factor intensity and limitations (Leontief Paradox); Factor Price Equalization theorem.

Unit II: Trade Policy

Concepts of terms of trade; Doctrine of reciprocal demand – Offer curve technique; Gains from trade, types; Free Trade vs Protected Trade, Tariffs- types, effects under partial and general equilibrium analysis; Quotas- effects its impact in partial equilibrium analysis; General Equilibrium analysis of tariff; the concept of optimum tariff.

Unit III: Exchange Rate and International monetary system

Concept and Types of Exchange Rate (bilateral vs. trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Mint Parity Theory, Purchasing-Power Parity Theory, Fixed versus Flexible exchange rate; IMF: Objectives of IMF, IMF's assistance to member countries (Rapid Financing Instrument, Rapid Credit Facility Stand only) for BoP deficit correction., World Bank and WTO; Their achievements and failures; Their Role from the point of view of India

Unit IV: Balance of Payments

Concepts and components of balance of trade and balance of payments; deficit and surplus in the balance of payments, Disequilibrium in balance of payments; Various measures to correct deficit in BOPs (Expenditure switching and expenditure reducing policies, Direct control), Depreciation Vs. Devaluation; Elasticity approach to devaluation, Foreign trade multiplier.

Text Book:

✓ Mannur H. G (2018), *International Economics*, Vikash Publishing/Sultan Chand

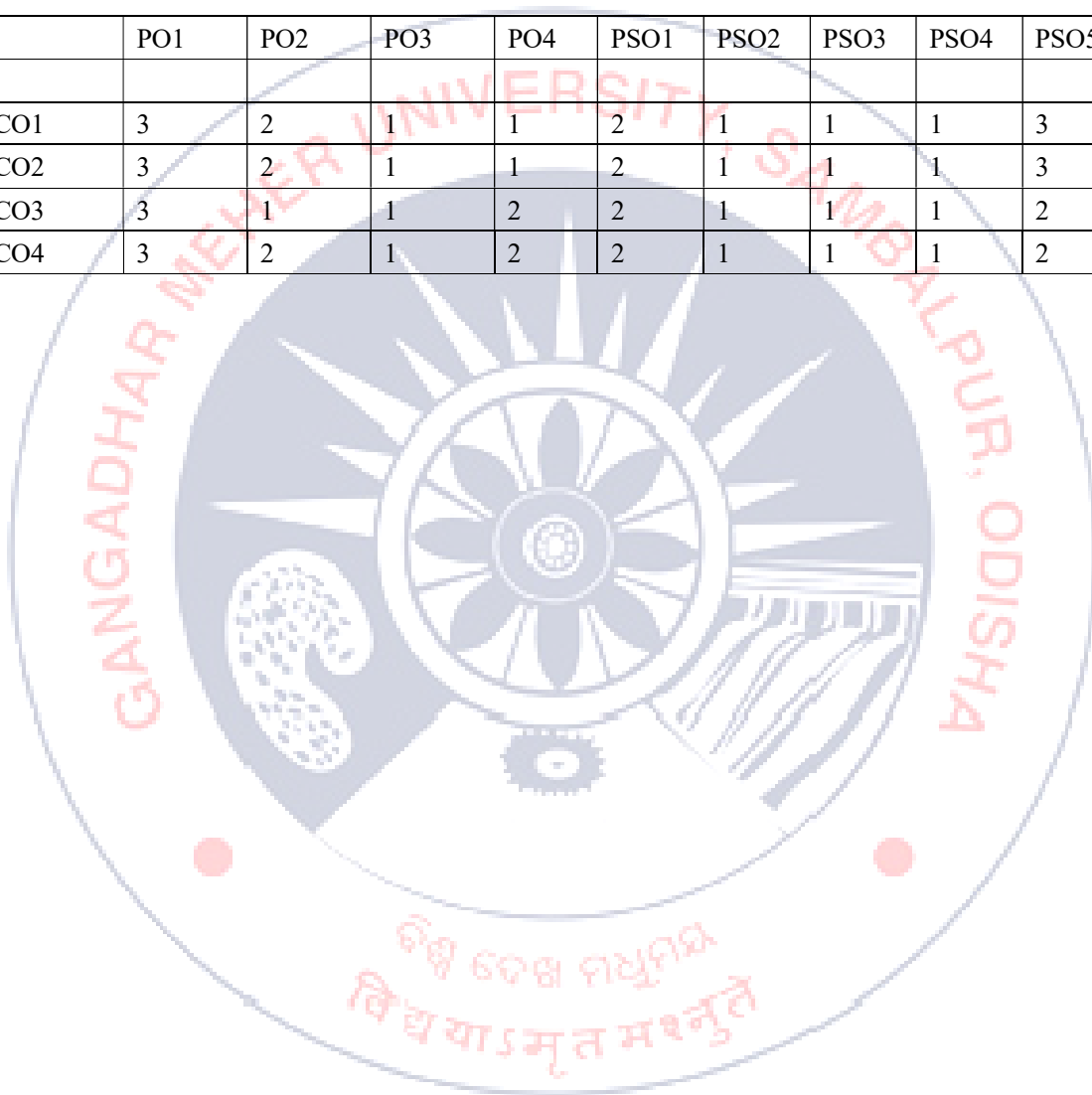
Reference Books:

✓ Salvatore Dominick (2016), *International Economics*, Wiley India.

✓ Sodersten Bo and Reed J (1994), *International Economics*, McMillan Publisher

✓ Dwivedi D. N. (2013), *International Economics: Theory and Policy*, Vikash Publishing.

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



Core 3

Minor paper 3: Money and Banking

Course Description

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

Course Outcomes:

- Understanding money and its types along with their functions and different measures of money supply.
- Understanding the basic concepts of banking, and its functions and to examine the banking scenario in India.
- To gain knowledge of the functions of central banks and monetary policies and how they have evolved.
- Get an understanding of the conceptual framework of the financial market and institutions of India.

Unit I: Money

Definition and functions of money; Types of money: legal tender money and bank money, near money; Value of money and index number; construction of index number; WPI, CPI, PPI, GDP deflator, Cost of living index. Demand for money- Classical and Keynesian approaches, Patinkin and the Real Balance Effect; Friedman's Quantity theory of money. Supply of Money- Measures of money supply: M₁, M₂, M₃ and M₄; High powered money and money multiplier.

Unit II: Commercial Banking

Meaning and types; Functions of commercial banks; the process of credit creation and its limitations; Balance sheet and portfolio management, Banking sector reforms in India; Lessons from Global Financial Crisis and Policy Response in India.

Unit III: Central Banking

Functions of a central bank; Quantitative and qualitative methods of credit control; Central Bank's Supervision and prudential measures for financial stability; current monetary policy of India, liquidity adjustment facility (LAF) through Repo and reverse repo operation, MSF.

Unit IV: Financial Markets

Financial Market, Meaning, Types, Money market and Capital Market, Primary and Secondary Market, Stock Exchanges, SEBI; Role of Financial Markets for Economic Development. Financial Instruments: Government securities, derivatives, futures and options, bond, debentures.

Text Book

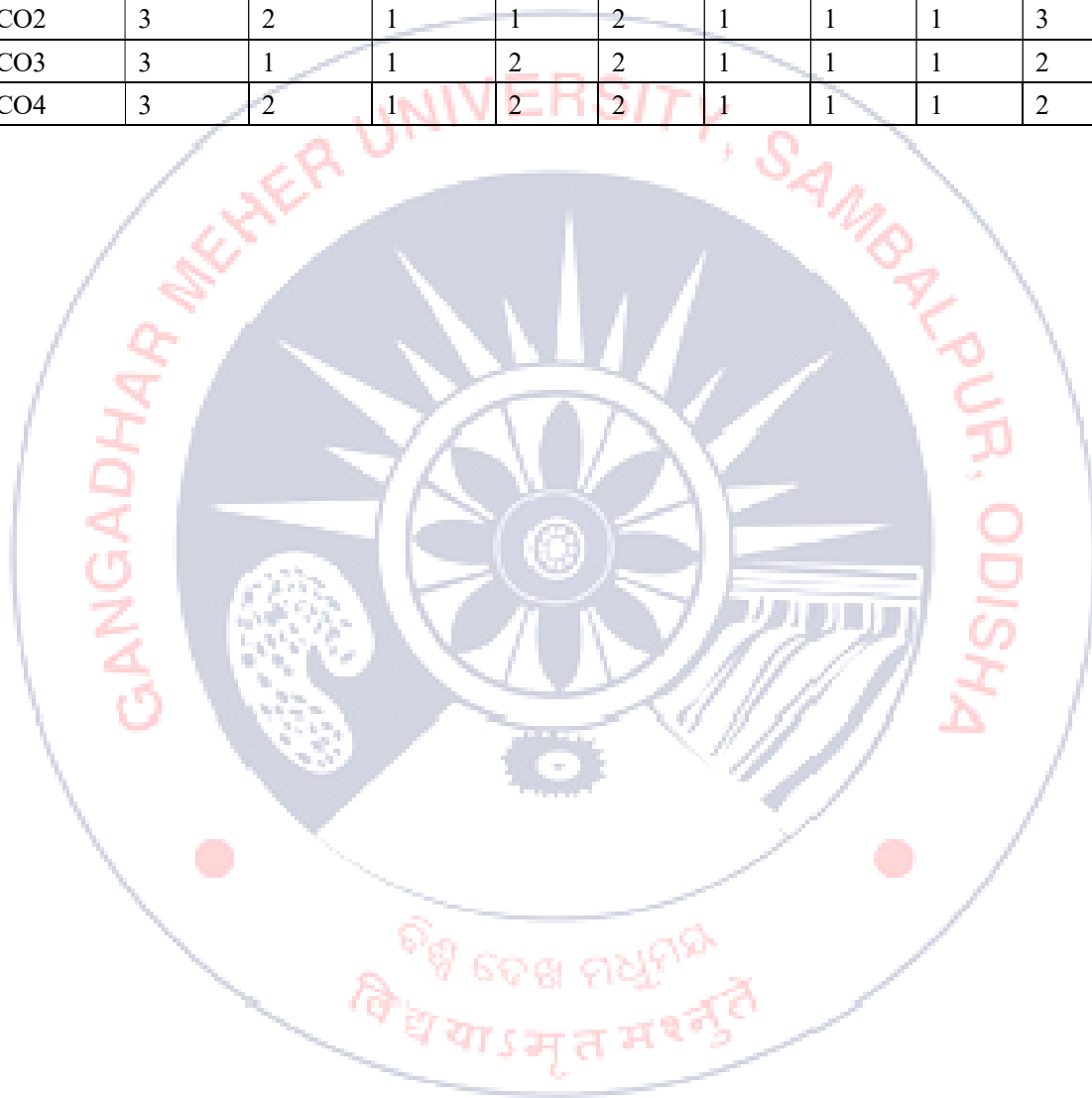
- ✓ Bhole, L. M. (2017): *Financial institutions and Market*, 6th Ed, Tata McGraw hill, New Delhi.
- ✓ Mishkin, F. S. & Eakins S. G (2017): *Financial Market and Institutions*, 8th Ed, PE, New Delhi.

Reference Book

✓ Suraj. B. Gupta (2010): *Monetary Economics: Institution, Theory and Practice*, S. Chand.

✓ Gorden & Natrajan (2023): *Financial Market and institutions*, 3rd Ed, Himalaya Publishing House

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



SEC 3

Data Analytics II

Course Description

This course introduces R and Python, which are popular statistical programming languages. The course covers data reading and its manipulation using R and Python, which is widely used for data analysis internationally. Loading, installing and building packages are covered in the syllabus.

Course Outcomes:

1. To develop Problem-solving and programming capabilities.
2. Getting introduced to R and Python, which are popular statistical programming languages, and use them to read data and manipulate it.
3. Developing an R script and execute it, understand working with Python language, install, load, and deploy the required packages, and build new packages for sharing and reusability,
4. To visualize and summarize the data, and design an application with database connectivity for data analysis.

Unit I: Introduction to R Programming

R Installation, loading and using packages; data types, data structure-Vectors, Matrix, Lists, Factors; Data Frames, conditional statements, loop statements, custom function, the apply family; Reading and getting data into R (External Data): using CSV files, Web Data, Excel files etc. Finding of Invalid values and Outliers, Descriptive Statistics, data visualization using scatter plot, line plot, bar chart, histogram, box plot etc.; Linear Regression using R.

Unit II: Python Basics

Installation of Python software; keywords, identifiers, comments in Python, python indentation, python statement; Data Structure and Data types; String operations in Python; Input-Output and formatting; operators and control flow; Functions in Python;

Unit III: Data Analysis with Python

Introduction to Data Science: NumPy and Pandas; Data Visualization in Python; Exploratory data analysis with Python.

Unit IV: Capstone in Business Analytics

Find an industry or business problem, collect data, develop a solution, create a business case, and present it to industry leaders and faculties in the department

Text Book

- ✓ Cotton, R., *Learning R: A step-by-step function guide to data analysis*. 1st edition. O'reilly Media Inc.
- ✓ Suresh Kumar Mukhiya and Usman Ahmed: *Hands-On Exploratory Data Analysis with Python: Perform EDA techniques to understand, summarize, and investigate your data*

Additional Readings

- ✓ Gardener, M. (2017). *Beginning R: The statistical programming language*, Wiley.
- ✓ Lawrence, M., & Verzani, J. (2016). *Programming Graphical User Interfaces in R*. CRC Press. (ebook)
- ✓ Paul Barry (2016): *Head-First Python*, 2nd edition, O'Reilly
- ✓ Avinash Navlani, Armando Fandango, Ivan Idris (2021) *Python Data Analysis: Perform data collection, data processing, wrangling, visualization, and model building using Python*

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2	1	1	1	3
CO2	3	2	1	1	2	1	1	1	3
CO3	3	1	1	2	2	1	1	1	2
CO4	3	2	1	2	2	1	1	1	2



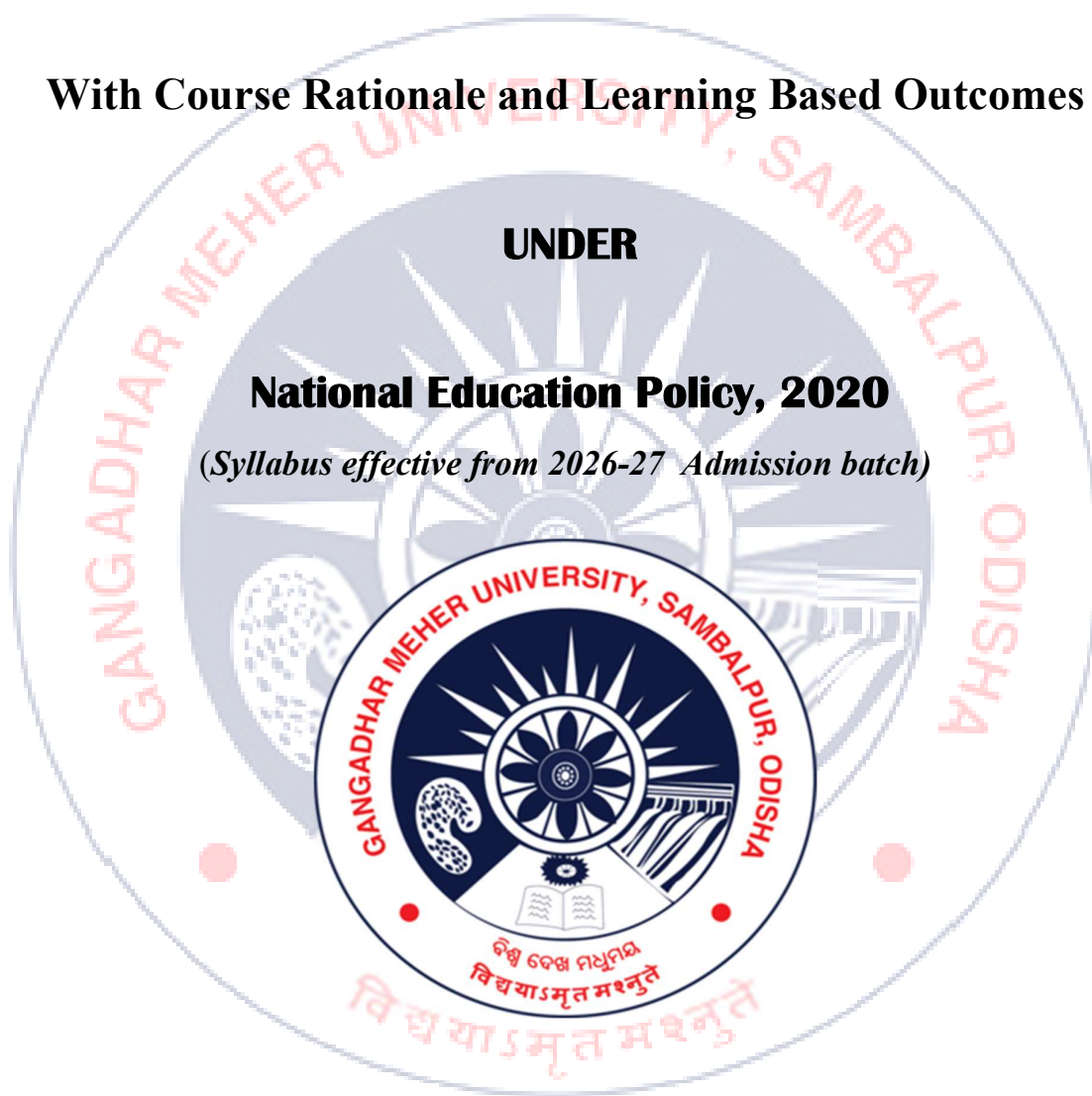
SYLLABUS FOR
B.A. with Double Major in Economics and Data Analytics
(Three Year Degree Course with
Apprenticeship Embedded Degree program)

With Course Rationale and Learning Based Outcomes

UNDER

National Education Policy, 2020

(Syllabus effective from 2026-27 Admission batch)



School of Economics
Gangadhar Meher University
Amruta Vihar, Sambalpur-768004



About the School

School of Economics has been an integral part of the GM University since its inception as a college. However PG course was introduced in the session 1966-67. From the very beginning the department is contributing to the society and the nation through its teaching and research activities. The Department has introduced M.Phil and Ph.D. courses since the academic session 2018-19. The Department has adopted the UGC prescribed CBCS syllabus in toto since the academic session 2015-16. The sanctioned strength of students is 80 for each year at UG Honours level and 48 for each year at PG level. Further in MPhil courses the sanctioned strength of students is 08 and at Post Doctoral level it is 02 (two). On an average students have been maintaining consistently high academic performance. The department has illustrious alumni to its credit who have been involved with the administration of the country at national level. The School has organized a national seminar in March 2016 and an international seminar in February 2017. The School hosts 06 full-time faculty members, 01 Ph.D. student and 08 M.Phil. students. Their research focuses on topics in the areas of Microeconomics, Economic Theory, Agricultural Economics, Political Economy, State Finance, Tribal Development, Behavioural Economics and Financial Economics.

Dr. Pramod Kumar Mishra (IAS), Principal Secretary to The Prime Minister, India; Prof. Sudhansu Sekhar Rath (Former Vice-Chancellor, GMU); Prof. Deepak Ku. Mishra (Professor, JNU), Prof. Jugal Kishore Mohapatra (IAS), Shri Arun Ku. Pujari (IAS) are few proud alumni of the school.

B.A. with Double Major in Economics and Data Analytics

(Three Year Degree Course with Apprenticeship Embedded Degree program)

On successful completion of the programme, a student will be able to:

PO1: Gain an ability to understand economic theories and the functioning of basic microeconomic and macroeconomic systems.

PO2: Be able to apply knowledge and skill in the field of Economics, research, statistics, and mathematics and will be able to have employability in these areas.

PO3: Be ready for work in the Economic world like banking, industries, education, etc.

PO4: Be poised to go for higher studies and engage in research in the field.

Based on the above POs, the students are also expected to achieve the following programme specific outcomes.

PSO No	Programme Specific Outcomes (PSOs) Upon completion of this programme the student will be able :
PSO1 (Advanced Knowledge)	To acquire advanced knowledge of Economics & Development issues of Indian Economy in general and Economy of Odisha in particular.
PSO2 (Practical Ability)	To conduct economic analysis using mathematical and statistical techniques especially by developing questionnaire, collecting primary data through field surveys.
PSO3 (Forecasting changes and Future development)	To forecast the future course of changes and development through their knowledge of policies and programmes of government and development agencies in the larger issues of epistemology in social sciences.
PSO4 (Employability and Entrepreneurship)	To visualize the real-world situation and enhance entrepreneurial skills for their self-employment, to improve the general attitudes and living conditions of the masses.
PSO5 (Identify, Evaluate and Analyse)	To apply economic theory for critically analyzing the real national and international problems for a thorough evaluation of economic events and makes them responsible citizens.

Semester	Course (paper)	Course Name	Credit
Semester I	MJ -1.1	Basic economics -I	4
	MJ -1.2	Indian Economy -I	4
	MJ -1.3	Mathematical Methods for Economics-I	4
	MJ- 1.4	Money and Banking	4
	MJ -2.1	Computational methods in Economics	4
	AEC (Ability Enhancement Courses)	English: Business Communication	4
	VAC (Value Added Course)	Environmental Studies & Disaster Management	3
		TOTAL	27
Semester II	MJ 1.5	Basic economics -II	4
	MJ 1.6	Indian Economy -II	4
	MJ 1.7	Statistical methods for Economies	4
	MJ- 1.8	Public Economics	4
	MJ 2.2	Introductory Econometrics	4
	AEC (Ability Enhancement Courses)	English: Word and Presentation skill	4
	VAC (Value Added Course)	Good Citizenship /or Any other discipline	3
		TOTAL	27
Semester III	MJ 1.9	Microeconomics-I	4
	MJ 1.10	Macroeconomics-I	4
	MJ 1.11	Mathematical Methods for Economics-II	4
	MJ- 1.12	Development Economics	4
	MJ 2.3	Fundamentals of Data Analytics	4
	MJ -2.4	Excel application in Data Analytics	4
	MDC (Multidisciplinary Course)	Economics or /any other discipline	3
	SEC (Skill Enhancement Course)	Economics or/ any other discipline	3
		TOTAL	30
Semester IV	MJ -1.13	Microeconomics-II	4
	MJ- 1.14	Macroeconomics-II	4
	MJ- 1.15	Environmental Economics	4
	MJ -2.5	Data Analytics using “R”	4
	MJ -2.6	Data Analytics using Python	4
	MDC (Multidisciplinary Course)	Economics /or any other discipline	3
	SEC (Skill Enhancement Course)	Economics /or any other discipline	3
		TOTAL	26
Semester V	Internship/Apprenticeship/Industry Training		20
Semester VI	Internship/Apprenticeship/Industry Training		20
TOTAL			150

** The 4yr. program of AEDP shall be as per 3 yr./4yr. UG Degree Program under NEP-2020*

Semester-I

1.1 Basic economics-I

Course Description

This course is designed to expose the students to the basic principles of how the economy works at the microeconomic level with some basic concepts like markets, and consumer choice. in macroeconomics. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations. This course also discusses the preliminary macroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.

Course Outcomes (COs)

- To expose the students to the introductory micro and macro-economic concepts.
- To explain how to think like an economist and illustrate how microeconomic concepts can be applied to analyses of real-life situations.
- To introduce preliminary macroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.
- To examine the circular flow of income and expenditure in a 2, 3, and 4-sector economy.

Unit I: Exploring the Subject Matter of Economics, Markets and Welfare

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The Economist as Scientist – The scientific method: Observation, Theory and more observation; Role of Assumptions; Economic Models; Why economists disagree; Graphs in Economics; The Market Forces; Markets and Competition; The Demand and Supply curves – Market vs Individual curves, Shifts in Demand and Supply Curves; Market Equilibrium and changes therein; Price Elasticity of Demand – determinants and computation; Income and Cross Elasticity of Demand; The Price Elasticity of Supply – determinants and computation; Consumer and Producer Surplus.

LO: Upon completion of this module, students will get a basic idea about the basic underlying principles followed in economics and get a formative perspective to concepts of elasticity of demand and supply.

Unit II: Theory of Consumer Choice

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of Indifference Curves; Two extreme examples of indifference curves; Optimization – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and Substitution Effect; Derivation of Demand Curve; Three applications – Demand for Giffen goods, Wages and Labour Supply, Interest rate and Household saving.

LO: Upon completion of this module, the students can understand the problem of choice and decision-making by consumers and have a vivid understanding of optimization and equilibrium.

Unit III: Basic Concepts in Macroeconomics

Macro vs. Microeconomics; Limitations of Macroeconomics; Stock and Flow variables, Equilibrium and Disequilibrium, Partial, and General Equilibrium Statics – Comparative Statics and Dynamics; National Income Concepts – GDP, GNP, NDP, and NNP at market price, factor cost, real and nominal; Disposable Personal Income.

LO: Upon completion of this module, the students will be introduced to concepts of macroeconomic variables and the basic concept of National Income Accounting.

Unit IV: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2-sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-

sector economies; National Income and Economic Welfare; Green Accounting.

LO: Upon completion of this module, the students will be familiarized with the estimation of National Income and understand the circular flow of income and expenditures in a closed and open economy.

Textbook:

- ✓ Gregory N Mankiw: *Principles of Economics*, 6th Edition, Cengage Learning India Private Limited, New Delhi
- ✓ Gregory N. Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
- ✓ Government of India (2012): *National Accounts Statistics Sources and Methods*, CSO, MOSPI

Reference Book:

- ✓ Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.
- ✓ Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

1.2 Indian Economy- I

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list should be updated annually.

Course Outcomes

1. To have an understanding of the evolution of the Indian economy from pre-colonial to modern times, and its current state as a developing economy.
2. To be able to explain the relationship between population growth, human development, and economic development in India.
3. To be able to assess the national income trends in India, including sectoral composition, regional disparities, and challenges like poverty, inequality, and unemployment.
4. To gain the ability to critically analyze the role of economic planning in India's development, including the evolution from Five-Year Plans to NITI Aayog.

Unit I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organization of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralization; The Land System and Commercialization of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonization and Modernization; State Policies and Economic Underdevelopment; The Current State of Indian Economy

LO: This module shall enable the students to gain an in-depth understanding of the pre-British Indian economy, including its structure, industries, colonial impacts, and modernization, and evaluate state policies and current economic conditions.

Unit II: Population and Human Development

Population Growth and Economic Development – size, growth and Future of Population; Causes of rapid Population Growth; Population and Economic Development; Population Policy; Demographic Issues– Sex and Age Composition of Population; Demographic Dividend; Urbanization and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

LO: Upon completion of this module, students will analyze the population trends and policies in India, understand their impact on economic development, and evaluate the importance of human development (education, health) for India's future.

Unit III: National Income in India: The Growth Story and Current Challenges

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage; Poverty – Estimation and Trends, Poverty Alleviation Programs– MGNREGA, NRLM, SJSRY; Inequality – Measures and trends in India; Unemployment– Nature, Estimates, Trends, Causes and Employment Policy.

LO: Upon completion of this module, students will have an understanding of national income trends, sectoral contributions, regional inequalities, and challenges that India faces like poverty, inequality, and unemployment.

Unit IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan– Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy;

From Planning to NITI– Transforming India’s Development Agenda.

LO: *Upon completion of this module, students will be able to appreciate the rationale and features of economic planning in India, its objectives and strategies, evaluate its achievements, and describe the transition to NITI Aayog.*

Textbook:

- ✓ *Misra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai*

Reference Books:

- ✓ *Dutt R. and Sundharam K. P. M: Indian Economy. S. Chand & Company Ltd., New Delhi.*
- ✓ *Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand: Indian Economy, Publications, 7th Revised Edition*
- ✓ *Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09*
- ✓ *Government of India (Current Year): Economic Survey, Ministry of Finance, New Delhi Basu, K. (2008): Oxford Companion to Economics in India, Oxford University Press*

1.3 Mathematical Methods for Economics I

Course Description

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Course Outcomes:

- To use mathematical techniques in analyzing economic problems
- To get a fair idea about the number system, set theory, and different types of functions.
- Evaluate and use the concept of derivative of functions involving single variables to link the total and marginal concepts in Economics.
- Understand major concepts of Linear Algebra

Unit I: Preliminaries and Functions of One Real Variable

Sets and set operations; Cartesian product; relations; functions and their properties; Number systems. Types of Functions: constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and Continuity of functions; Limit theorems.

LO: *This module will enable the students to know the theory of sets, ordered pairs, and Cartesian products; and learn the concepts of relation and function and limit and continuity of functions.*

Unit II: Derivative of a Function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions.

LO: *This module will enable the students to know the concept of the derivative and the rules for derivatives; and about the economic applications of differentiation in establishing the relationship between total, marginal, and average functions in Economics.*

Unit III: Functions of two or more Independent Variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity.

LO: *This module will enable the students to find out partial derivatives of multivariate functions; and calculate elasticities of multivariate functions.*

Unit- IV: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

LO: *This module will enable the students to understand different types of matrices and determinants; and learn about the matrix operations and solve systems of linear equations using matrices.*

Textbook:

- ✓ C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition

Reference Book:

- ✓ *K. Sydsaeter and P. J. Hammond (2002): Mathematics for Economic Analysis. Pearson Educational Asia*
- ✓ *Edward T Dowling (2004): Introduction to Mathematical economics, Tata McGeaw-Hill, Third Edition.*
- ✓ *Taro Yamane (1995): Mathematics foe Economists: An elementary survey. New Delhi Prentice Hall. Second Edition*

1.4 Money and Banking

Course Description

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

Course Outcomes:

- Understanding money and its types along with their functions and different measures of money supply.
- Understanding the basic concepts of banking, and its functions and to examine the banking scenario in India.
- To gain knowledge of the functions of central banks and monetary policies and how they have evolved.
- Get an understanding of the conceptual framework of the financial market and institutions of India.

Unit I: Money

Definition and functions of money; Types of money: legal tender money and bank money, near money; Value of money and index number; construction of index number; WPI, CPI, PPI, GDP deflator, Cost of living index. Demand for money- Classical and Keynesian approaches, Patinkin and the Real Balance Effect; Friedman's Quantity theory of money. Supply of Money- Measures of money supply: M_1 , M_2 , M_3 and M_4 ; High powered money and money multiplier.

LO: This module will enable students to understand various concepts of money and money substitutes, functions of money, and monetary aggregates.

Unit II: Commercial Banking

Meaning and types; Functions of commercial banks; the process of credit creation and its limitations; Balance sheet and portfolio management, Banking sector reforms in India; Lessons from Global Financial Crisis and Policy Response in India.

LO: This module will make the students aware of basics of commercial Banking and Finance.

Unit III: Central Banking

Functions of a central bank; Quantitative and qualitative methods of credit control; Central Bank's Supervision and prudential measures for financial stability; current monetary policy of India, liquidity adjustment facility (LAF) through Repo and reverse repo operation, MSF.

LO: Upon completion of this module, students will be able to appreciate the effects of the major policy tools and understand how central banks affect the financial system of the economy.

Unit IV: Financial Markets

Financial Market, Meaning, Types, Money market and Capital Market, Primary and Secondary Market, Stock Exchanges, SEBI; Role of Financial Markets for Economic Development. Financial Instruments: Government securities, derivatives, futures and options, bond, debentures.

LO: This module shall help students to understand the nature of financial instruments and their usage.

Textbook

- ✓ *Bhole, L. M. (2017): Financial institutions and Market, 6th Ed, Tata McGraw hill, New Delhi.*
- ✓ *Mishkin, F. S. & Eakins S. G (2017): Financial Market and Institutions, 8th Ed, PE, New Delhi.*

Reference Book

- ✓ *Suraj. B. Gupta (2010): Monetary Economics: Institution, Theory and Practice, S. Chand.*
- ✓ *Gorden & Natrajan (2023): Financial Market and institutions, 3rd Ed, Himalaya Publishing house*

2.1 Computational Methods in Economics

Course Description

This course introduces the students to understand uses of computers and their applications in economics. After completion of the course, students will develop professional competency in working with MS Office.

Course Outcomes:

- To understand the uses of computers and their applications in Economics.
- To develop professional competency in working with MS Office.
- To get hands-on use of Microsoft Office applications- Word, Excel, PowerPoint, and Access.
- To gain basic soft skills in handling data, creation, and formatting of Word documents, and making presentations.

Unit-I: Computer Fundamentals

The basic architecture of CPU and its functions – Input device and output device – Primary and secondary memory. Operating systems - concept and types, Windows- concepts and components; Basics of a computer network: LAN, WAN, and MAN; Introduction to internet and its applications; booting process, Machine language, and assembly language; Applications of computer in Economics, other fields.

LO: This module shall make the students understand the basics of computers – parts, memory, network, and internet.

Unit II: MS Word, PowerPoint, and Access Applications

MS Word: Word basics, creation of a document, use of tables, pictures, and charts; editing, formatting, and printing documents; MS PowerPoint: Features, Creation of Slides for presentation, Types of view, Slide master, Templates and Slide transition; MS-Access: Data Field, Record, Database file, Types of files, Types of records, Data type, Database evolution, Data transfer from Excel to Access

LO: Upon completion of this module, students shall be able to create text documents using MS Word, create interesting and appealing presentations using MS PowerPoint, and apply Database Management Software (DBMS) like MS Access to manage data of businesses and enterprises.

Unit III: Worksheet & MS Excel

Basics of worksheet –creating a worksheet, entering data into a worksheet, sorting data, autofill, saving & protecting a worksheet, Formatting of a worksheet. Previewing & Printing worksheet; Create an Excel chart; Drawing charts: Area, Bar, Column, Line, Pie, Scatter, etc. Move and Resize your chart; Charts Styles and Layouts; Chart Titles and Series Titles; Format chart Panel; Add labels to a Chart; Format chart segments; Format Axis titles; Format your Axis titles

LO: Upon completion of this module, students shall develop the ability to arrange data in spreadsheets using graphing tools, pivot tables, and formulas.

Unit IV: MS-Excel Basic Function

Basic calculations: Sum, Sqrt, Max, Min, Count, Averages, Rank; Conditional and logical functions: IF, AND, OR; Estimation of correlation and regression; Hypothesis testing: t-test, F-test and Z-test Excel Pivot Tables; The LOOKUP Function; The VLOOKUP Function in Excel; Hyperlinks in Excel

LO: This module shall enable the learner to analyze data using MS Excel functions.

Textbooks:

- ✓ *New Perspectives Microsoft Office Excel 2016, Comprehensive Enhanced Edition, by Parsons, et al, Nelson Publisher.*
- ✓ *Sinha, P. K. (2004): Computer Fundamentals, 6th Ed, BPB Publications, New Delhi.*

Reference Book

- ✓ *Raja Raman.V. (2014): Fundamentals of Computers, 6th Ed, PHI, New Delhi.*
- ✓ *Kerns R. L.(1992): Essentials of Microsoft Windows, Word and Excel, PHI.*
- ✓ *Alexis Leon & Mathews Leon: Introduction to Computers with Ms-Office, TMH.*

AEC Paper I

English: Business Communication

Credits: 4

S. No	Modules	Outcomes
1.	English Language and Communication: Introduction	● Communication, its Importance and Factors ● Types of Communication ● Verbal and Non-verbal Communication ● Styles of Communication
2	English Language and Communication: Listening and Speaking	● Types of Listening ● Speaking to communicate effectively ● Style of speaking in Various Situations ● English Pronunciation
3	English Language and Communication: Reading and Writing	● Reading methods and techniques. ● Reading texts to Understand meaning ● Writing Process ● Writing short and Long texts
4	English Language and Communication: Grammar and Vocabulary	● Grammar ● Sentence structure ● Functions of Language

Reference Book: A Course book for ENGLISH COMMUNICATION (Publisher: Orient BlackSwan)

VAC Paper I

Environmental Studies & Disaster Management

(Credit-3)

Unit 1: Multidisciplinary nature of environmental studies (8 Period)

Definition, scope and importance

Need for public awareness

Environmental Pollution

Definition

• Cause, effects and control measures of:-

a) Air pollution

b) Water pollution

c) Soil pollution

d) Marine pollution

e) Noise pollution

f) Radiation pollution

Unit 2: Natural Resources: (8 Period)

Renewable and non-renewable resources:

Natural resources and associated problems.

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.

Biodiversity:- Introduction-Definition; Biogeographically classification of India

India as a mega diversity nation. Hot spots of biodiversity, Threats to biodiversity. Endangered and endemic species of India. Conservation of biodiversity. In Situ and Ex-situ conservation of biodiversity

Unit-3: Disaster Management (8 Period)

1. Disaster Management: Types of disasters (natural and Man-made) and their causes and effect)
2. Vulnerability Assessment and Risk analysis: Vulnerability to various disasters (Flood, Cyclone, Earthquake, Heat waves, Desertification and Lightning)
3. Institutional Framework: Institutional arrangements for disaster management (National Disaster Management Authority (NDMA), State Disaster Management Authority (SDMA), Disaster Management Act, 2005, District Disaster Management Authority (DDMA), National Disaster Response Force (NDRF) and Odisha Disaster Rapid Action Force (ODRAF)
4. Preparedness measures: Disaster Management cycle, Early Warning System, Pre Disaster and Post-Disaster Preparedness, strengthening of SDMA and DDMA, Community Preparedness for flood cyclone, heat waves, fire safety, lightening and snake biting. Stake holders participation, Corporate Social Responsibility (CSR)
5. Survival Skills: Survival skills adopted during and after disaster (Flood, Fire, Earthquake, Cyclone and Lightning), Disaster Management Act-2005, Compensation and Insurance

Unit 4: Social Issues and the Environment (6 Period)

- A. a) Environmental Ethics: Issues and possible solutions.
 - b) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies
 - c) Environment Protection Act
 - d) Air (Preservation Control of Pollution) Act
 - e) Water (Preservation Control of Pollution) Act
 - f) Wildlife Protection Act
 - g) Forest Conservation Act
 - h) Solid waste management Cause, effect and Control Measure of Urban and Industrial waste (Role of each individual in conservation of Natural resources and prevention of pollution)
 - B. Human Population and the Environment
- Population Ecology: Individuals, species, population, community
- Human population growth, population control method
- Urbanisation and its effect on society

Unit 5: Field work (15 Periods of 30 hrs)

- Visit to an area to document environmental assets: river/forest/flora/fauna, etc.
- Visit to a local polluted site- Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-pond, river, Delhi Ridge , etc.

Semester-II

1.5 Basic Economics II

Course Description

This course is designed to expose the students to the basic principles of how the economy works at the microeconomic level with some basic concepts like production, firms and input markets. This course also aims to introduce the students to the basic macroeconomic concepts of money, inflation, and the theories of determination of income and employment in the aggregate economy.

Course Outcomes

- ✓ To have a clear idea about the principles that govern the economy's running at the micro and macro levels.
- ✓ To understand about the working of the input market.
- ✓ To gain clarity about dynamic concepts of Inflation, Employment, money, and income.
- ✓ To understand of the theories of determination of income and employment in the aggregate economy.

Unit I: The Firm and Market Structures

Cost concepts; Production and Costs; The various measures of cost – Fixed and Variable cost, Average and Marginal cost; Cost curves and their shapes; Costs in the short run and the long run; Economies and diseconomies of scale. Firms in Competitive Markets – What is a competitive market; Profit maximization and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run

LO: Upon completion of this module, the students will have a clear understanding of the traditional theory of cost and different cost concepts, and be able to distinguish between short-run and long-run costs, and relate them to a firm's decision-making under competitive markets.

Unit II: The Input Markets

The Demand for Labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the Labour Market; Other factors of production: Land and Capital; Linkages among factors of production

LO: Upon completion of this module, the students will get an insight into the analysis of demand and supply of inputs and the linkages among the factors of production.

Unit III: Money and Changes in its Value

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices

Inflation – Meaning, Causes, and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Inflationary Gap, Deflation- Meaning, Causes, and Anti-Deflationary Measures, Depression and Stagflation; Inflation vs. Deflation

LO: Upon completion of this module, the students shall understand the evolution of money and the classical theories of money supply and be able to explain the causes of inflation and deflation in an economy and the impact and solution thereto.

Unit IV: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier

LO: Upon completion of this module, the students shall get to know the classical and Keynesian theories of income and employment determination.

Textbook:

- ✓ *Gregory N Mankiw: Principles of Economics, 6th Edition, Cengage Learning India Private Limited, New Delhi*
- ✓ *Gregory N. Mankiw (2010): Macroeconomics, 7th edition, Cengage Learning India Private Limited, New Delhi*
- ✓ *Government of India (2012): National Accounts Statistics Sources and Methods, CSO, MOSPI*

Reference Book:

- ✓ *Karl E. Case and Ray C. Fair (2007): Principles of Economics, 8th Edition, Pearson Education Inc.*
- ✓ *Richard T. Froyen (2005): Macroeconomics, 2nd Edition, Pearson Education Asia, New Delhi.*

1.6 Indian Economy II

Course Description

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list should be updated annually.

Course Outcomes

- To analyze the current state of Indian agriculture, including production trends, factors influencing production, and policy initiatives like land reforms and the green revolution.
- To evaluate the development of Indian industries, including historical industrial policies, challenges faced by small-scale industries, and the role of labor.
- To assess the contribution of the tertiary sector to the Indian economy, and understand the concept of Human Resource Development (HRD) and its role in India's development.
- To explain India's foreign trade scenario, including trade composition, export promotion strategies, and the role of foreign capital.
- To analyze the environmental policies implemented in India and the global response to climate change, considering India's specific situation.

Unit I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

LO: Students will be able to analyze the structure, challenges, and advancements in Indian agriculture, including policies, credit, and marketing.

Unit II: Industrial Development in India

Trends in industrial output and productivity; Industrial Policies of 1948, 1956, 1977, and 1991; Industrial Licensing Policies – MRTP Act, FERA, and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labor.

LO: Students will know about industrial output and productivity trends, industrial policies, the impact of licensing policies, small-scale industries' growth, industrial finance, and labor issues in India.

Unit III: Tertiary Sector, HRD, and the External Sector

Tertiary Sector: growth and contribution of the service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition. Foreign Trade: role, composition, and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

LO: Students will have an understanding of the growth of India's service sector, human development strategies (education & health), and international trade dynamics (exports, imports, foreign investment)

Unit IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development

1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India.

LO: Students will be able to analyze key environmental policies in India, the global deal on climate change, IPCC's role, climate change impacts, and global responses to India's role.

Textbook:

- ✓ *Mishra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai*

Reference Books:

- ✓ *Dutt R. and Sundharam K. P. M.: Indian Economy. S. Chand & Company Ltd., New Delhi.*
- ✓ *Datt and Sundharam, Gaurav Datt and Ashwani Mahajann: Indian Economy, S Chand Publications, 7th Revised Edition*
- ✓ *Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09*
- ✓ *Government of India (Current Year): Economic Survey, Ministry of Finance, New Delhi*

1.7 Statistical Methods for Economics

Course Description:

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of the relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables, and introduces the most frequently used theoretical distribution, the Normal distribution.

Course Outcomes:

- To summarize data effectively using measures of central tendency, dispersion, and graphical techniques.
- To analyze relationships between variables through correlation and regression analysis.
- To understand and interpret time series data by identifying trends and seasonality.
- To apply probability theory and sampling techniques to solve statistical problems and assess data validity.

Unit I: Data Collection and Measures of Central Tendency and Dispersion

Basic concepts: population and sample, parameter and statistics; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits, and demerits; Measures of skewness and kurtosis.

LO: *At the end of this module, students will be able to distinguish between population and sample, collect and organize data, and calculate measures of central tendency and dispersion to understand a data set's characteristics.*

Unit II: Correlation and Regression Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient. Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate.

LO: *This module shall help students master the techniques to measure the strength and direction of relationships between variables (correlation) and use linear regression analysis to model and predict those relationships.*

Unit III: Time Series and Index Number

Time Series: definition and components, measurement of the trend- freehand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of the seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyres's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

LO: *Upon completion of this module, students will be able to analyze time series data for trends and seasonality, and construct and interpret index numbers to measure price and quantity changes.*

Unit IV: Probability Theory and Sampling

Probability: Basic concepts, addition, and multiplication rules, conditional probability; Meaning of Sampling, Types of Sampling: Probability Sampling versus Non-Probability Sampling; Simple Random Sampling and its selection, Systematic Sampling, Multi-stage Sampling, Quota Sampling; Error: Sampling and Non-sampling.

LO: Upon completion of this module, students will be able to calculate probabilities, understand different sampling methods (probability vs. non-probability), and identify potential errors associated with sampling.

Basic Readings and Textbooks:

- ✓ S. C. Gupta (2017): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi

Reference Book:

- ✓ Murray R. Spiegel (2017): *Theory & Problems of Statistics*, Schaum's publishing Series.
- ✓ A L Nagar & R K Das (1983): *Basic Statistics*. Oxford University Press.

1.8 Public Economics

Course description:

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Course Outcomes:

- The course will familiarize the students with the relevance, responsibilities, and sources of receipts of the government.
- Students will be able to understand the rationale behind the public provision of specific goods and services and what can be left to market for provision.
- Students will be able to understand the normative ideas behind public expenditure, taxation, and public debt as well as the budget of government and its impact on the economy.
- Students will be able to understand the methods of fiscal management by the government in India.

Unit I: Introduction to Public Finance and Public Budgets

The concept of Pareto Optimality. Pareto improvement and potential Pareto improvement. Public good versus private good; Free riding and public Good provision. Maximum Social advantage. Market failure and role of government; Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy

LO: *This module will give an idea of the goods to be provided by the government and market and the challenges faced by the government to provide public goods; and will also teach about different types of budgets and their implications for the economy.*

Unit II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses. Pareto Optimality Criterion, social Allocation

LO: *This module will educate on the principles behind public expenditure and the causes behind the rise in the public expenditure.*

Unit III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India, Introduction of GST in India. Issues and Challenges relating to GST.

LO: *This module will educate on the sources of receipts for the government, theoretical ideas behind taxation, and implementation of GST in India.*

Unit IV: Public Debt

Sources, effects, debt burden – Classical/ Ricardian views, Keynesian and post-Keynesian views; shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt.

LO: *This module will give a fair idea of different aspects of the implications of public debt on the economy*

Textbooks:

- ✓ J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.

Reference Book:

- ✓ R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
- ✓ Bhatia H L (2018): *Public Finance*. Vikas Publishing House.

2.2 Introductory Econometrics

Course Description:

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Course Outcomes:

- To have a comprehensive introduction to basic econometric concepts and techniques.
- To gain an understanding of the statistical concepts of hypothesis testing, estimation, and diagnostic testing of simple and multiple regression models.
- To gain knowledge about the consequences, tests, and remedies of violation of Least Square assumptions.

Unit I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Binomial, Poisson and Normal distributions: their properties. Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation.

LO: *This module will enable the students to know about some common discrete and continuous theoretical probability distributions; and to know about estimators, point and interval, and the desirable properties of point estimators.*

Unit II: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test; Test statistics: z, chi square, t and F.

LO: *This module will enable the student to gain knowledge about statistical hypotheses and the procedure of testing of hypothesis; and have an understanding of type I and type II errors in the procedure of hypothesis testing.*

Unit III: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and co- variance between Least square estimates; BLUE properties; Standard errors of estimates; Co- efficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting. Introduction to multiple regression models.

LO: *This module will enable the students to understand the concept and usefulness of regression analysis and differentiate between Linear and non-linear relations; understand the difference between simple & multiple linear regression models and their estimation as well as inference drawn therefrom.*

Unit IV: Violation of Classical Assumptions

Heteroscedasticity, Multicollinearity and Auto-correlation: Meaning, consequences, tests and remedies.

LO: *This module will enable the student to understand the consequences, tests, and remedies of violation of Least Square assumptions.*

Textbook:

- ✓ Gujarati, D & Sangeetha (2007); —*Basic Econometrics*l, McGraw Hill Book Co.

Reference Book:

- ✓ Wooldrige, J. M. (2022): *Introductory Econometrics: A modern Approach*, 7th Ed, Cengage Publication

AEC Paper II

English: Word and Presentation skill

Credits: 4

S. No	Modules	Outcomes
1.	Basic Communication	● Explain: ○ Structures in present and present continuous tense ○ Structures in past & past continuous tense ○ Structure in present perfect & present perfect continuous tense ○ Structures in future tense ○ Modals: helping verbs ○ Prepositions ○ Idioms ● Practice speech on a given topic. ● Practice Extempore speech
2	Communication	● Describe communication. ● Describe the Process of communication. ● Discuss the Importance of communication ● Explain various Types of communication. ● Demonstrate Useful Phrases for Everyday Use ● Explain the technique of Asking Questions
3	Hotel English	● Describe the Essential qualities of a good speaker. ● Discuss Speech improvement- pronunciation. ● Explain the importance of Stress in speech. ● Describe Intonation and modulation. ● Describe Common phonetics- difficulties

VAC Paper I

Good Citizenship

Credits:3

Objectives/Learning Goals of the Course

- Development of good human being and a responsible citizen
- Developing a sense of right and wrong leading to ethically correct behavior.
- Inculcating a positive attitude and a healthy work culture.

Learning Objectives:

- Understanding Basic Values of Indian Constitution.
- Understand how to be a patriot.
- Develop professionalism and understand the ethics relating to various professions.

1. Indian Constitution (1 Credit= 15 hours)

Salient Values of Preamble: Sovereign, Socialist, Secular, Democratic, Republic, Justice, Liberty, Equality and Fraternity

2. Patriotism (1 Credit= 15 hours)

Patriotic Value and ingredients of nation building, Concept of Good Citizenship, Emotional connection with the country, Duties of citizens and Qualities of good citizens

3. Work Ethics (1 Credit= 15 hours)

Punctuality, Cleanliness, Law abidingness, Rational Thinking and Scientific Temper

Semester-III

1.9 Microeconomics I

Course Description

The course is designed to provide sound training in microeconomic theory to formally analyze the behavior of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behavior of the consumer and the producer and also covers the behavior of a competitive firm.

Course Outcomes:

- To develop an understanding of preferences and consumer choice and formally analyze the behavior of individual agents
- To be able to use mathematical tools to facilitate understanding of the basic concepts of Economics.
- To understand the behavior of the consumer and the producer.
- To understand the behavior of a competitive firm.

Unit I: Consumer Theory I

Preferences and Utility, Axioms of Rational Choice, Utility, Trades and Substitutions, Indifference curves; Mathematics of Indifference curves, Utility functions for specific preferences, the many good cases; Utility Maximization and choice: the 2-good case (graphical analysis), the n-good case, Indirect utility function, the Lump sum principle, Expenditure minimization, properties of the expenditure function.

LO: *This module will enable the students to understand the basic concepts in consumer behavior like utility, choice, optimization, and Indifference curves using mathematical tools; and differentiate between direct and indirect utility, and explain expenditure function and its properties.*

Unit II: Consumer Theory II

The Income and Substitution Effects: Demand function, changes in income, changes in goods price- Direct and Indirect Approaches (Slutsky), the Individual's Demand Curve, Compensated (Hicksian) demand curves and functions, demand elasticity, Consumer Surplus, Demand relationships among goods, the 2-good case, substitutes and complements, Net (Hicksian) substitutes, and Complements, Substitutability with many goods.

LO: *This module will enable the students to analyze the effects of changes in income and prices on demand; differentiate between Ordinary and compensated demand; explain the concepts of price and income elasticities, and substitutability between goods; and understand the concept of Consumer Surplus*

Unit III: Production Theory and Costs

Production Functions: Marginal productivity, Production with One Variable Input (labour) and with Two-Variable Inputs, Isoquant Maps and the Rate of Technical Substitution, Returns to Scale, Elasticity of Substitution, Some Simple Production Functions: Linear, Fixed Proportions; Technical Progress. Definition of Cost and its properties, Cost minimizing input choices (Optimization principles, Expansion Path), Cost Functions and Shift in Cost Curves, Long-Run versus Short-Run Cost Curves.

LO: *This module will enable the students to understand concepts like production function in the short run and the long run, isoquants, and substitution between inputs; and explain concepts of cost, and optimization in the short run and long run*

Unit IV: Profit Maximization

The Nature and Behaviour of Firms, Marginal Revenue – Relationship between Average and marginal revenue, Short-Run Supply by a Price-Taking Firm, Profit Functions and its Properties, Profit maximization – General conditions, Input demands

LO: This module will enable the students to understand the behavior of the competitive firm and concepts like average and marginal revenue; and learn the conditions for profit maximization, properties of profit function

Textbook:

- ✓ *C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India*

Reference Books:

- ✓ *H. R. Varian (2010): Intermediate Microeconomics: A Modern Approach, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems*

1.10 Macroeconomics- I

Course Description

This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as long run, and the role of policies in this context.

Course Outcomes:

- To understand the basics of consumption function and its relation with income, and factors influencing consumption function.
- To get a knowledge about various types of investment spending and evaluate the impact of investment through multiplier and accelerator in economies.
- Discuss the various approaches to demand and supply of money.
- Analyse and interpret the IS-LM model as a step toward understanding economic fluctuations.

Unit I: Consumption

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent, and Life-cycle hypothesis

LO: This module shall enable the students to find out how consumption is affected by income and other factors.

Unit II: Investment

Autonomous and Induced Investment, Residential and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI, Theories of Investment: The Accelerator and Tobin's theory

LO: Students will gain an understanding of different forms of investment spending and theories of investment

Unit III: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical, and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money – Classical and Keynesian Approaches, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India, RBI approach to money supply, Determination and Money multiplier. High-powered money and money multiplier

LO: Students will be able to understand the workings of money in an economy.

Unit IV: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium

LO: This module shall help to gain knowledge about the way the goods market and money market serve as a basis for the determination of employment, output, price, and investment.

Text Readings:

- ✓ *N. Gregory Mankiw (2010): Macroeconomics, 7th edition, Cengage Learning India Private Limited, New Delhi.*
- ✓ *Richard T. Froyen (2005): Macroeconomics, 2nd Edition, Pearson Education Asia, New Delhi.*

Reference Book:

- ✓ *Snowdon, B. and Vane H. R. (2005). Modern macroeconomics –its Origins, Development and Current State. Edward Elgar Publishing Limited, Cheltenham, UK.*
- ✓ *Ahuja H. L. (2019). Macroeconomics- Theory and Policy. 20th Edition, S Chand publication.*
- ✓ *Dwivedi, D. N. (2018): Macroeconomics -Theory and Policy. 5th Edition, Tata McGraw Hill.*

1.11 Mathematical Methods for Economics II

Course Description:

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Course Outcomes:

- To use mathematical techniques to analyze economic problems.
- To have an understanding of the input-output models.
- To be able to use second and higher-order derivatives and integration to analyze the nature of functions.
- To develop the ability to optimise objective functions subject to satisfaction of constraints.

Unit I: Linear models:

Input-Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; Solution for equilibrium output in a three-industry model; The closed model.

LO: *This module will enable the students to get an idea of the static input-output model in its closed and open versions, which are of great practical importance in Economics.*

Unit II: Second and Higher Order Derivatives and Integration:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection, Derivative of Implicit Function; Higher Order Partial Derivative. Indefinite Integrals; Rules of Integration; Techniques of Integration: Substitution Rule, Integration by parts, and Partial Fractions; Definite Integral – Area Interpretation.

LO: *This module will enable the students to know the concept of higher-order derivatives and integration, definite and indefinite; and the applications of higher-order derivatives and integration in Economics.*

Unit III: Single and Multivariable Optimization:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions – First and Second derivative tests (using Hessian Determinants); Economic applications thereof, First and second order condition for extrema of multivariable functions; Convex functions and convex sets.

LO: *This module will enable the student to learn the concept of optimization of single and multi-variable functions.*

Unit IV: Optimization with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable single constraint case only); First and second order condition; The Bordered Hessian determinant.

LO: This module will enable the student to understand the meaning and definition of constraint optimization, and the use of the Lagrange multiplier method and the Bordered Hessian determinant to optimize an objective function with respect to a constraint.

Text Reading:

- ✓ *A. C. Chiang and K. Wainwright (2005): Fundamental Methods of Mathematical Economics, McGraw Hill International Edition.*

Reference Book:

- ✓ *K. Sydsaeter and P. J. Hammond (2002): Mathematics for Economic Analysis. Pearson Educational Asia*
- ✓ *Edward T Dowling (2004): Introduction to Mathematical economics, Tata McGeaw-Hill, Third Edition.*
- ✓ *Taro Yamane (1995): Mathematics for Economists: An elementary survey. New Delhi Prentice Hall. Second Edition.*

1.12 Development Economics I

Course Description:

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Course Outcomes:

- The course will enhance the understanding of concepts of development and the need for it.
- It helps students learn about aggregate models of growth.
- It examines the axiomatic basis for inequality measurement and explores the connections between growth and inequality.
- It familiarizes the students with the socio-economic and political institutions while showing their contribution to economic development.

Unit I: Study of Economic Development

Conceptions of Development economic growth and economic development; Alternative measures of development, documenting the international variations in these measures, comparing development trajectories across nations and within them measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; Happiness Index

LO: Upon completion of this module, students learn the alternative concepts associated with the development and the changes in the measurement of development over time.

Unit II: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Harrod-Domar model, Solow model and convergence with population growth and technical progress.

LO: Upon completion of this module, students gain an elaborate knowledge about the growth theories put forth by different Schools of Economics.

Unit III: Poverty, Inequality, Agriculture, Industry and Development:

Measuring poverty: Head Count Ratio, Poverty Gap Ratio, Squared Poverty Ratio, FGT Ratio; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Policy options – some basic considerations

Agriculture, Industry and Economic Development: Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

LO: This module shall help the learners to understand different measures of poverty and inequality in an economy and gain an insight into the role of agriculture and industry in economic development and the dynamic complementarity between the two sectors.

Unit IV: Institutions and Economic Development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

LO: Upon completion of this module, students get to know the importance and role of institutions in the process of economic development.

Textbook:

- ✓ *Todaro, Michael P and Stephen C Smith (2006): Economic Development, 8th Edition, Pearson*

Reference Books:

- ✓ *Debraj Ray (2009): Development Economics, Oxford University Press.*
- ✓ *Thirlwall, A P (2011): Economics of Development, 9th Edition, Palgrave Macmillan*

2.3 Fundamentals of Data Analytics

Course Description:

This course provided an introduction to the principles, techniques and application of Data Analytics. It familiarises a student with the process of data collection, organization, analysis and interpretation so as to generate meaningful insights.

Course Outcomes:

- Understand the fundamental concept and foundation of Data analytics in Economics
- Identify the significance of data analytics in various spheres of study.
- Preprocess data from various sources using appropriate techniques for analysis and interpretation of data sets including accessing the confidence level.
- Demonstrate about data privacy, visualization tools and limitation of data analytics in real world situation.

Unit I:

Foundations of Data Analytics: Data, information, knowledge - types of data: structured, unstructured, time-series, cross-section, panel. Types of data analytics: descriptive, diagnostic, predictive, prescriptive.

Unit II:

Data analysis process: problem definition, data collection, data cleaning, data analysis, modelling, interpretation, reporting. Role of data analytics in economics, business and policy making. Analytics vs Statistics vs ML

Unit III:

Analytics Methods for Economics: Statistical inference basics: sampling distributions, confidence intervals, hypothesis testing - t, z, f chi-square and Regression analysis, interpretation for policy

Unit IV:

Time series analytics: trend, seasonality, smoothing, ARIMA basics, Data visualization & dashboards. Index numbers and growth rate, CAGR (compound annual growth rate). Data visualisation ethics: data privacy, bias, reproducibility, communicating results to technical and non-technical audience.

Suggested Readings

Textbooks

- ✓ Kumar, U. D. (2017). Business Analytics: The Science of Data-Driven Decision Making Wiley India
- ✓ Gupta, S. P. (2022). Statistics for Economics. Sultan Chand & Sons.

References

- ✓ C.R. Kothari – Research Methodology: Methods and Techniques
- ✓ Maheshwari, A. (2017). Data Analytics: The Science of Data Analytics Made Accessible. McGraw Hill Education (India).
- ✓ Wheelan, C. (2021). Naked Statistics: Stripping the Dread from the Data (Updated Edition). W. W. Norton & Company.
- ✓ Hyndman, R. J., & Athanasopoulos, G. (2021). Forecasting: Principles and Practice (3rd ed.). OTexts

2.4 Excel Application in Data Analytics

Course Description

Microsoft excel course is a versatile tool for data analytics. It facilitates students in developing practical's skills with data sets using formulas, functions, and data validation techniques. Excel is extensively used for data analysis in economics, social sciences, research and helps in developing advanced analytics tools and techniques.

Course Outcomes

- It introduces students to Microsoft excel as a tool for Data Management and analysis
- It develops the ability to organise preprocess data using excel: its functions and features
- Equip and enable students to create data visualization, dashboard for decision making
- Promotes critical thinking and problem-solving skills through hands on exercise and case studies

Unit 1: Introduction to MS Excel and Data Entry

Overview of Spreadsheet Applications, Features of Microsoft Excel, Excel Interface and Navigation, Workbook, Worksheet, Rows, Columns, and Cells, Creating, Saving, and Opening Files, Entering and Editing Data, Cell Formatting, Number Formats for Economic Data, Tables and Borders, Conditional Formatting

Unit 2: Charts and Graphical Representation and Managing Economic Data

Line Charts, Bar Charts, Pie Charts, Combo Charts, Sparklines and Dashboards, Sorting and Filtering, Data Validation, Removing Duplicates, Importing CSV and External Data, Organizing Economic Datasets, Creating PivotTables, Pivot Charts

Unit 3: Descriptive Statistics and Formulas in Excel

Mean, Median, and Mode, Variance and Standard Deviation, Correlation Analysis, Frequency Distribution, Histograms, Arithmetic Operations, Cell References (Relative and Absolute), SUM, AVERAGE, COUNT, MIN, MAX, IF and Logical Functions, Percentage Calculations

Unit 4: Economic and Financial Calculations

Growth Rate Analysis, Inflation Rate Calculation, Compound Growth, Index Numbers, Trend Analysis, Trend Lines, Moving Averages, Forecast Sheet, Scenario Analysis, Introduction to Regression Analysis, Interpreting Regression Output, Formatting Reports, Exporting and Printing Reports

Practical Work

1. Calculate GDP growth rates
2. Compute inflation percentages
3. Analyze household consumption expenditure
4. Prepare a GDP dataset, Format inflation and unemployment tables, Import and clean economic data
5. Create inflation trend charts
6. Analyze wage distribution
7. Compare regional unemployment data
8. Regional GDP analysis using PivotTables
9. Forecast inflation trends
10. Analyze relationship between income and consumption

Key Formulae

- $\text{Growth Rate} = ((\text{Current Value} - \text{Previous Value}) / \text{Previous Value}) \times 100$

- $FV = PV(1 + r)^n$
- Variance: $s^2 = \Sigma(x_i - \bar{x})^2 / (n - 1)$
- Linear Regression: $y = a + bx$

Suggested Practical Project

- Inflation Analysis of India
- GDP Growth Comparison
- Unemployment Trend Analysis
- Trade and Export Dashboard
- Household Consumption Survey Analysis

Suggested References

- ✓ *Excel Data Analysis for Dummies* by Stephen McDaniel
- ✓ *Microsoft Excel Training*: <https://support.microsoft.com/excel>
- ✓ *World Bank Data Portal*: <https://data.worldbank.org>

Semester-IV

1.13 Microeconomics II

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers the Market, general equilibrium and welfare, imperfect markets, and topics under information economics.

Course Outcomes:

- To understand short-run and long-run supply decisions of a competitive firm & industry equilibrium
- To have a basic understanding of concepts of Pareto efficiency in consumption & production; general equilibrium, and welfare theorems
- To develop an understanding of imperfect markets such as Oligopoly
- To understand basic concepts of game theory.

Unit I: Firm Supply and Equilibrium

Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent

LO: Upon completion of this module, students will understand the short-run and long-run supply decisions of a competitive firm and the concept of industry equilibrium; and gain an idea about long-run average costs, zero profit, and economic rent

Unit II: General Equilibrium, Efficiency and Welfare

The Edgeworth Box; Trade; Pareto Efficient Allocations; Existence, Stability and Uniqueness of equilibrium; Walras Law; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems; Production possibilities, comparative advantage and Pareto efficiency

LO: This module shall help to understand concepts like Pareto efficiency, and general equilibrium in consumption and learn welfare theorems, comparative advantage, production possibilities, and general equilibrium in production

Unit III: Market Imperfections: Monopoly and Monopolistic Competition

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Price Discrimination, Degrees of Price Discrimination, Regulation of Monopoly, Dynamic Views of Monopoly. Monopolistic competition – product differentiation, Selling costs and excess capacity

LO: This module shall aid in understanding the nature of monopoly markets and the role of barriers to entry and explain price discrimination; and to explain features of monopolistic competition and the question of economic inefficiency in equilibrium

Unit IV: Oligopoly and Game Theory

Non-collusive oligopoly models: Cournot, Bertrand, Stackelberg, Sweezy, Chamberlin, Collusive oligopoly models: Cartels, Price leadership. The Payoff Matrix of a Game; Nash Equilibrium, Pure and Mixed Strategies, The Prisoner's Dilemma, Repeated Games, Tit-for tat strategy, Enforcing a cartel, Sequential Games, A Game of entry deterrence

LO: Upon completion of this module, students will be able to understand and explain the features of oligopoly and learn different models thereof; and the meaning and use of game theory in oligopoly; understand concepts like Nash equilibrium and different types of games, especially Prisoner's dilemma.

Textbook:

- ✓ *H. R. Varian (2010): Intermediate Microeconomics: A Modern Approach, 8th Edition,*
- ✓ *W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.*
- ✓ *Koutsoyiannis, A (1979): Modern Microeconomics, 2nd Ed, ELBS/Macmillan*

Reference Book:

- ✓ *C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.*
- ✓ *Robert S. Pindyck and Daniel Rubinfeld: Microeconomics, 8th Edition, Pearson*
- ✓ *H. L. Ahuja (2018): Advanced Economic Theory. Twenty-First Edition, Sultan Chand Publication*

1.14 Macroeconomics II

Course Description

This paper deals with growth models and the classical school of thought, and its evolution into Keynesian economics. The students are introduced to long-run dynamics in growth and technical progress. This paper also familiarizes about the open economy and its dynamics.

Course Outcomes:

- To emphasize on conceptual understanding and some applications of important growth models.
- To enable critical appreciation of the classical school of thought and the evolution of Keynesian economics.
- To understand the theoretical underpinnings of economic policy in open economies, such as monetary and fiscal policy, the basic Mundell-Fleming model, and nominal and real exchange rate determination.
- To understand the trade-off between Unemployment and Inflation; get a critical understanding of Long-run and Short-run Phillips Curve, unemployment, and Expectations.

Unit I: Economic growth model:

Accumulation of capital in the basic Solow model; supply and demand for goods, growth in the capital stock and the steady state, Golden rule level of capital, comparing steady states, transition to the golden rule steady state with too much and too little capital, population growth technological progress – Solow version

LO: The module shall enable the students to get conceptual clarity and strengthen theoretical foundations of the Solow growth model

Unit II: Classical and Keynesian Macroeconomic thought

Classical macroeconomics, Employment and output determination: Say's law; the quantity theory of money, Keynes General theory: Keynes main propositions, Analysis of the labour market, Keynes critique of Says law and Quantity Theory of Money, the orthodox Keynesian school, underemployment equilibrium in the Keynesian model.

LO: This module shall help students in developing a clear, comprehensive understanding of how and in what ways the Classical and Keynesian schools of economic thought differ from each other.

Unit III: Open Economy and Macroeconomic policies

Balance of payments –concepts, meaning of equilibrium and disequilibrium in Balance of payments measures to correct disequilibrium. Determination of foreign exchange rate- the balance of payments theory, fixed versus flexible exchange rate; the short run open economy model: The basic Mundell-Fleming model: Macroeconomic policies – Fiscal policy - Crowding-out and Crowding-in; Monetary policy and instruments, the Transmission Mechanism, Effectiveness of macroeconomic policies in the open and closed economies.

LO: This module will enable students to get clarity on macroeconomic theories and models in the context of open economies, the interdependent nature of key macroeconomic variables,

sectors, and markets, and the dynamics of responses to exogenous domestic and international economic shocks

Unit IV: Inflation, Unemployment and Expectations

Inflation – Unemployment trade-off and the Phillips curve – short run and long run analysis, Adaptive and Rational expectation hypothesis. The policy ineffectiveness debate. Phillips curve and orthodox Keynesian school. Solow and Tobin's modified Philips curve.

LO: Upon completion of this module, students shall be able to derive the Phillips Curve from the Aggregate Supply Curve, the short-run and long-run Phillips curve, and understand the role of adaptive expectations and rationale expectations.

Text Readings:

- ✓ *Richard T. Froyen (2005): Macroeconomics, 2nd Edition, Pearson Education Asia, New Delhi.*
- ✓ *N. Gregory Mankiw (2010): Macroeconomics, 7th edition, Cengage Learning India Private Limited, New Delhi.*

Suggested References:

- ✓ *Levacic R and Rebmman A (1982): Macroeconomics –An introduction to Keynesian – neoclassical controversies*
- ✓ *Edward Shapiro (2001): Macroeconomics Analysis- Galgotia Publication Private Limited, 5th Edition, New Delhi.*
- ✓ *Dwivedi, D. N. (2018): Macroeconomics -Theory and Policy. 5th Edition, Tata McGraw Hill.*
- ✓ *Blanchard, O. (2013): Macroeconomics. 7th edition, Pearson Edn*

1.15 Environmental Economics

Course Description

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Course Outcomes:

- To understand the basic concepts/principles of Environmental Economics
- To be able to analyse and apply the concepts to understand specific case studies.
- To develop insights into the valuation of the environment.
- To become capable to execute/create the Project or field assignment as per the knowledge gained in the course.

Unit I: Economy and Environment

Concepts of Environmental Economics, Natural Resource Economics, and Ecological Economics. Important environmental Problems (Air pollution, water pollution, deforestation, climate change and global warming), Economy-Environment inter-linkages, Role of environment for economic development, Effect of economic development (industrialization, urbanisation, modernization of agriculture) on environment, Consequences of environmental degradation on the economy and the wellbeing of the people and other living beings, concept of Environment-Kuznets Curve hypothesis.

LO: This module will aid in acquiring knowledge of the concepts related to Environmental Economics and in understanding the Environment-Economy interlinkage.

Unit II: The Economics of Pollution and Climate change

Environment and Market Failure, Nature of environment quality (Non-rivalry and non-excludability), Pollution as public bad, Pollution as negative externality. Pigouvian tax for optimal pollution, Property rights and bargaining for optimal pollution (Coase Theorem), Government's Command and Control method for controlling pollution. Climate change as market failure (Greenhouse gas externality, lack of incentives for developing low carbon technology), policy measures for mitigations of climate change (carbon taxes and tradable carbon rights).

LO: This module will be useful for the students in understanding the nature of pollution and getting knowledge of pollution control and climate change mitigating tools.

Unit III: Valuation of Environment

Difficulties of valuation of eco-system services, Concepts of Economic value of environment (Use and non-use value, Option value, Existence value); Willingness to pay (WTP) and willingness to accept (WTA) compensation for improvement/deterioration of environment quality, Revealed Preference Method of valuation of environment (The hedonic price approach, Travel Cost approach) Contingent Valuation method.

LO: Upon completion of this module, the learner shall gain knowledge of the different methods of valuing environmental services.

Unit IV: Natural Resources and Sustainable Development

Natural resources; renewable and exhaustible; management of exhaustible resources and the Hotelling's rule; management of renewable resources (case of fishery only) optimally, Concept of carrying capacity of Environment (related to resource use and pollution), Issues of irreversibility, uncertainty in the natural resource use and waste disposal, Sustainable Development: Concepts and Components (Social, Economic and Environmental), Daly's operational principles for sustainability, Sustainable Development Goals (SDGs).

LO: This module shall initiate an understanding of the limits of the use of natural resources from the point of view of their sustainability and Sustainable development.

Textbook:

- ✓ *Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi*

Reference Book:

- ✓ *Kolstad, C.D (1999): Environmental Economics. Oxford University Press, New Delhi*

Course objectives

- Understand the fundamentals of R programming and its application in economic and social science data analysis.
- Develop skills for importing, cleaning, transforming, and managing datasets obtained from surveys, government reports, and economic databases.
- Apply descriptive statistical techniques and data visualization methods to explore and interpret economic and social data.

Course outcomes

- Demonstrate proficiency in basic R programming concepts, including data types, control structures, functions, and data structures for handling economic datasets.
- Import, clean, organize, and transform data from various sources using R and Tidyverse packages to prepare datasets for analysis.
- Apply descriptive statistics and probability concepts to summarize and interpret economic and demographic data.
- Create effective visualizations using ggplot2 and other R tools to communicate patterns, trends, and relationships in economic data.

Course Content

Unit I: Foundation of R Programming(15 Hours)

Introduction to R and RStudio, Installing and Setting Up R, Variables and Data Types, Operators and Expressions, Control Structures and Functions, Vectors, Lists, and Data Frames

Practical Activities: Writing simple R scripts, Basic arithmetic and statistical calculations, Creating and manipulating vectors

Unit II: Data Manipulation and Cleaning in R (15 Hours)

Importing Data from CSV and Excel Files, Introduction to Tidyverse, Data Frames and Tibbles, Data Cleaning Techniques, Handling Missing Values, Filtering, Sorting, and Transforming Data

Practical Activities: Cleaning survey datasets, Transforming economic and social datasets

Unit III: Data Visualization and Statistical Analysis (15 Hours)

Interpreting Statistical Results: Descriptive Statistics, Probability Distribution, Hypothesis Testing, Data Visualisation with ggplot2, creating histograms, boxplots, scatterplots

Practical Activities: Analyzing demographic datasets, Visualizing trends and distributions, Comparing datasets using graphs

Unit IV: Applied Data Analysis and Reporting (15 Hours)

Correlation and Regression Analysis, Introduction to Predictive Modeling, Time Series Analysis Basics, Creating Reports with R Markdown, Introduction to Reproducible Research

Practical Activities: Regression analysis using real-world data, Forecasting trends using time series

Suggested Readings

- ✓ *R for Data Science*
- ✓ *An Introduction to Statistical Learning with Applications in R*
- ✓ *Using R for Introductory Statistics*
- ✓ *Practical Statistics for Data Scientists*

Major II

Credit 04

2.6 Data Analytics using Python

Course Objectives

This course introduces students to Python-based data analytics with applications in economics and social sciences. Upon completion of the course, students will be able to:

- Understand the fundamentals of Python programming and data handling.
- Perform data cleaning, preprocessing, and transformation using Python.
- Apply data visualization and exploratory data analysis techniques to economic datasets.
- Conduct statistical inference and hypothesis testing using Python.

Course Learning Outcomes

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

- Import, clean, manage, and manipulate large datasets using Python.
- Create effective visualizations and perform exploratory data analysis to identify patterns and relationships.
- Develop, evaluate, and interpret regression and classification models.
- Use time-series techniques to analyse trends and generate forecasts.

Course Content

Unit I: Fundamentals (15 Hours)

Introduction to Data Analytics, Python Basics, NumPy and Pandas, Data Import and Export, Data Cleaning Handling missing values

Unit II: Statistics and Visualization (15 Hours)

Applications of Central Tendency and dispersion, Histograms, Boxplots, Scatterplots, Correlation Analysis and Interpretation

Unit III: Applied Analytics (15 Hours)

Hypothesis Testing, Chi-square Test, Simple Linear Regression, Logistic Regression, Case Studies from Census/Education/Economics

Unit IV: Time Series Analysis and Forecasting (15 Hours)

Time Series Analysis, Moving Averages, Exponential Smoothing, Introduction to Machine Learning, Data Ethics and Privacy

Suggested Readings

- ✓ McKinney, W. (2022). *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Jupyter* (3rd ed.). O'Reilly Media.
- ✓ Swaroop, C. H. (2016). *A Byte of Python*. Self-published.
- ✓ Black, K. (2019). *Business Statistics for Contemporary Decision Making* (10th ed.). Wiley.
- ✓ VanderPlas, J. (2016). *Python Data Science Handbook*. O'Reilly Media.
- ✓ Géron, A. (2022). *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow* (3rd ed.). O'Reilly Media.

