Model Curriculum for Three/Four Year Degree Course (With Multiple Entry/Exit Option)

Based on NEP-2020

Economics

Semester	Name of the Papers
I	1. Basic Economics I
	2. Indian Economy I
II	3. Basic Economics II
	4. Indian Economy II
III	5. Microeconomics I
	6. Macroeconomics I
	7. Mathematical Methods for Economics I
IV	8. Microeconomics II
	9. Macroeconomics II
	10. Statistical Methods for Economics
V	11. Development Economics I
	12. Mathematical Methods for Economics II
	13. History of Economic Thought Or Money and Banking Or Economy of Odisha
VI	14. Introductory Econometrics Or Public Economics I Or Development Economics II
	15. Computational Methods in Economics Or Environmental Economics Or International Economics
VII (With Research)	16. QuantitativeMethods
	17. Research Methodology
	18. Basic Econometrics
(Without Research)	16. QuantitativeMethods
	17. Research Methodology
	18. Basic Econometrics
	19.Economicsof Growth and Development
VIII (With Research)	20.MicroeconomicsIII
	21.Macroeconomics III
	Dissertation
VIII (Without Research)	20.MicroeconomicsIII
	21.Macroeconomics III
	22.PublicEconomicsII
	23.EconomicsofSocialSector

BA Economics Programme Outcomes

On successful completion of the programme, a student will

- Gain an ability to understand economic theories and the functioning of basic microeconomic and macroeconomic systems.
- 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.
- Be ready for work in the Economic world like banking, industries, education, etc.
- Be poised to go for higher studies and engage in research in the field.

Core-I
1.

Course Description

BasicEconomicsI

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.

CourseOutcomes(COs)
1. Toexposethe students to the introductorymicroand macro-economicconcepts.
2. Toexplainhowtothink likeaneconomistandillustratehowmicroeconomicconcepts can be applied to analyses of real-life situations.
3. To introduce preliminarymacroeconomic concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, and GDP.
4. Toexaminethe circular flow ofincomeand expenditurein a 2, 3, and 4-sector economy.

UnitI:ExploringtheSubjectMatterofEconomics,Marketsand 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 Demandand Supplycurves – Market vs Individual curves, Shifts inDemandand SupplyCurves; 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 thismodule, studentswill 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:TheoryofConsumer 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.

UnitIII:BasicConceptsin 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.

LO: Uponcompletionofthis module,thestudents willbeintroduced to conceptsofmacroeconomicvariablesand the basic concept of National Income Accounting.

UnitIV:MeasurementofMacroeconomicVariables

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 Incomeand understand the circular flow of income and expenditures in a closed and open economy.

Text Book:
- ✓ *GregoryNMankiw:PrinciplesofEconomics,6thEdition,CengageLearningIndiaPrivate Limited, New Delhi*
- ✓ *GregoryN.Mankiw(2010):Macroeconomics,7thedition,CengageLearningIndiaPrivate Limited, New Delhi*
- ✓ *Government ofIndia(2012): National AccountsStatistics Sources andMethods, CSO, MOSPI*

ReferenceBook:
- ✓ *KarlE.CaseandRayC.Fair(2007):PrinciplesofEconomics,8thEdition,Pearson Education Inc.*
- ✓ *Richard T. Froyen (2005): Macroeconomics, 2nd Edition, Pearson Education Asia, NewDelhi.*

Core I   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 PlanninginIndia

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan– Objectives, Targets and Achievements; Twelfth Five Year Plan – Visionand 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.andPuriV.K.IndianEconomy—ItsDevelopmentExperience. HimalayaPublishing House, Mumbai*

ReferenceBooks:
- ✓ *DuttR.andSundharamK.P.M:IndianEconomy.S.Chand&CompanyLtd.,New Delhi.*
- ✓ *DattandSundharam,GauravDattandAshwaniMahajan,SChand:IndianEconomy, Publications, 7ᵗʰ Revised Edition*
- ✓ *Indian EconomySince Independence,ed byUma Kapila,Academic Foundation,Revised Nineteenth Edition 2008-09*
- ✓ *GovernmentofIndia(CurrentYear):EconomicSurvey,MinistryofFinance, NewDelhi*
- ✓ *Basu,K. (2008):OxfordCompaniontoEconomicsin India,OxfordUniversityPress*

SEMESTERII

Core I   **3. BasicEconomicsII**

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 aggregateeconomy.

Course Outcomes

✓ *To have a clear idea about the principles that govern the economy's running at the micro and macro levels.*
✓ *Tounderstand aboutthe workingoftheinput market.*
✓ *Togainclarityaboutdynamicconcepts ofInflation,Employment,money,and income.*
✓ *Tounderstandofthetheoriesofdeterminationofincomeandemploymentinthe aggregate economy.*

UnitI:TheFirmandMarket Structures

Cost concepts; Production and Costs; The various measures of cost – Fixed and Variable cost, Average andMarginal cost;Costcurves andtheir shapes;Costsinthe short run andthe longrun; 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 supplydecision; 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 ofcostand differentcostconcepts,and beableto distinguishbetweenshort-runand long-runcosts, and relatethem to a firm's decision-making under competitive markets.

UnitII:TheInput 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; Thesupply 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.

UnitIII:Money andChanges 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 Measurers, 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:DeterminationofNationalIncome

The Classical Approach - Say's Law, Theoryof 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.

Text Book:
- ✓ GregoryNMankiw:*PrinciplesofEconomics*,6thEdition,CengageLearningIndiaPrivate Limited, New Delhi
- ✓ GregoryN.Mankiw(2010):*Macroeconomics*,7thedition,CengageLearningIndiaPrivate Limited, New Delhi
- ✓ Government ofIndia (2012): *National AccountsStatistics Sources andMethods*, CSO, MOSPI

ReferenceBook:
- ✓ *KarlE.CaseandRayC.Fair(2007):PrinciplesofEconomics,8thEdition,Pearson Education Inc.*
- ✓ *Richard T. Froyen (2005): Macroeconomics, 2nd Edition, Pearson Education Asia, NewDelhi.*

Core I   **4. IndianEconomyII**

Course Description
This courseexamines sector-specificpolicies and theirimpact in shapingtrends in keyeconomic 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
- ToanalyzethecurrentstateofIndianagriculture,includingproductiontrends,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 assessthe contributionof the tertiary sectortotheIndian economy,andunderstand 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 toclimate change, considering India's specific situation.

Unit I:AgriculturalDevelopmentinIndia
IndianAgriculture:nature,importance,trendsinagriculturalproductionandproductivity,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 advancementsin Indian agriculture, including policies, credit, and marketing.

Unit II:IndustrialDevelopmentinIndia
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:Studentswillknowaboutindustrialoutputandproductivitytrends,industrialpolicies,theimpactoflicensing policies, small-scale industries' growth, industrial finance, and labor issues in India.

Unit III:TertiarySector,HRD,andtheExternal 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:IndianEconomyandEnvironment
Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection)Rules1986,TheNationalForestPolicy1988,PolicystatementforAbatementof

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 Responseon 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.andPuriV.K.IndianEconomy—ItsDevelopmentExperience. HimalayaPublishing House, Mumbai*

ReferenceBooks:
- ✓ *DuttR.andSundharamK.P.M.:IndianEconomy.S.Chand&CompanyLtd.,New Delhi.*
- ✓ *DattandSundharam,GauravDattandAshwaniMahajann:IndianEconomy,S Chand Publications, 7th Revised Edition*
- ✓ *IndianEconomySinceIndependence,edbyUmaKapila,AcademicFoundation, RevisedNineteenth Edition 2008-09*
- ✓ *GovernmentofIndia(CurrentYear):EconomicSurvey,MinistryofFinance, NewDelhi*

SEMESTER III

 Core I   5. MicroeconomicsI

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 analyzethe behavior of individual agents
- To be able to use mathematical tools to facilitate understanding of the basic concepts ofEconomics.
- Tounderstand the behaviorof theconsumer and theproducer.
- Tounderstand the behaviorof acompetitivefirm.

UnitI:ConsumerTheoryI
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:ConsumerTheoryII
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

UnitIII:Production TheoryandCosts
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 andthe long run, isoquants, and substitution between inputs; and explain concepts of cost, and optimization in the short run and long run

UnitIV:ProfitMaximization

The Nature and Behaviour of Firms, Marginal Revenue – Relationship between Average and marginal revenue, Short-Run Supplyby 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

Text Book:
- ✓ C.SnyderandW.Nicholson(2012):MicroeconomicTheory:BasicPrinciplesandExtensions, 11th Edition, Cengage Learning, Delhi, India

ReferenceBooks:
- ✓ H.R.Varian(2010):IntermediateMicroeconomics:AModernApproach,8thEdition,W.W. Norton and Company/Affiliated East-West Press (India). The workbook byVarian and Bergstrom may be used for problems

Core I   **6. Macroeconomics I**

Course Description
This course introduces the students to formal modelling of a macro-economy in terms of analyticaltools.Itdiscussesvarious alternativetheoriesofoutputandemploymentdetermination in a closed economy in the short run as well as long run, and the role of policies in this context.

Course Outcomes:
- Tounderstandthebasicsofconsumptionfunctionanditsrelationwithincome,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.
- Discussthevarious approachesto demand and supplyof money.
- AnalyseandinterprettheIS-LMmodelasasteptowardunderstandingeconomic 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:Thismoduleshallenablethestudentstofindouthowconsumptionisaffectedbyincomeandotherfactors.

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:Studentswillgainanunderstandingofdifferentformsofinvestmentspendingandtheoriesofinvestment

Unit III:DemandforandSupplyof 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:Studentswillbeabletounderstandtheworkingsofmoneyinaneconomy.

Unit IV:AggregateDemandandAggregateSupply
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.GregoryMankiw(2010):Macroeconomics,7thedition,CengageLearningIndia PrivateLimited, New Delhi.*
- ✓ *RichardT.Froyen(2005):Macroeconomics,2ndEdition,PearsonEducationAsia, NewDelhi.*

ReferenceBook:
- ✓ *Snowdon,B.andVaneH.R.(2005).Modernmacroeconomics–itsOrigins, Development and Current State.Edward Elgar Publishing Limited, Cheltenham, UK.*
- ✓ *AhujaH.L. (2019).Macroeconomics-TheoryandPolicy. 20thEdition,SChand publication.*
- ✓ *Dwivedi, D. N.(2018): Macroeconomics -Theory and Policy. 5th Edition, Tata McGraw Hill.*

Core I   **7.MathematicalMethodsforEconomicsI**

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 econometricsset out in this syllabus.In thiscourse, particulareconomic models arenottheends,but the means for illustrating the method of applying mathematical techniquesto economic theoryin general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Course Outcomes:

- Tousemathematical techniques in analyzingeconomicproblems
- Togetafair ideaabout thenumbersystem,set theory,and differenttypes of functions.
- Evaluate and use the concept of derivative of functions involving single variables to link the total and marginal concepts in Economics.
- UnderstandmajorconceptsofLinearAlgebra

UnitI:PreliminariesandFunctionsofOneRealVariable

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

UnitII:Derivativeof a Function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiabilityof 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.

UnitIII:Functionsof twoormoreIndependentVariables

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:Matricesand Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants:concept, properties,solvingproblems usingpropertiesofdeterminants, solution to asystem ofequations - Crammer'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.ChiangandK.Wainwright(2005):*FundamentalMethodsofMathematical*

  Economics,McGrawHillInternationalEdition

ReferenceBook:

- ✓ *K.SydsaeterandP.J.Hammond(2002):MathematicsforEconomicAnalysis.PearsonEducation al Asia*
- ✓ *EdwardT Dowling(2004):IntroductiontoMathematicaleconomics, Tata McGeaw-Hill, Third Edition.*
- ✓ *Taro Yamane (1995):Mathematicsfoe Economists: Anelementarysurvey.New Delhi Prentice Hall. Second Editio*

Core I   **8.Microeconomics II**

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarityto 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
- Tohaveabasicunderstandingofconceptsof Paretoefficiencyinconsumption& production; general equilibrium, and welfare theorems
- Todevelopan understandingofimperfect marketssuchas Oligopoly
- Tounderstandbasic conceptsofgametheory.

UnitI:FirmSupplyand Equilibrium

Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; LongRun SupplyCurveofa Firm; LongRun AverageCosts;ShortRun 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:GeneralEquilibrium,EfficiencyandWelfare

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 Paretoefficiency

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

UnitIII:MarketImperfections:MonopolyandMonopolisticCompetition

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

LO: Thismoduleshallaid inunderstanding thenatureof monopolymarketsand theroleof barriersto entryand explain price discrimination; and to explain features of monopolistic competition and the question of economic inefficiency in equilibrium

UnitIV:OligopolyandGame 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

oligopolyandlearndifferentmodelsthereof;andthemeaninganduseofgametheoryinoligopoly;understandconceptslikeNas hequilibriumanddifferenttypesofgames,especiallyPrisoner'sdilemma.

Text Book:
- ✓ *H.R.Varian(2010):IntermediateMicroeconomics:AModernApproach,8thEdition,*
- ✓ *W.W.NortonandCompany/AffiliatedEast-WestPress(India).TheworkbookbyVarian and Bergstrom may be used for problems.*
- ✓ *Koutsoyiannis,A(1979):ModernMicroeconomics,2ndEd,ELBS/Macmillan*

ReferenceBook:
- ✓ *C.SnyderandW.Nicholson(2012):MicroeconomicTheory:BasicPrinciplesand Extensions, 11th Edition, Cengage Learning, Delhi, India.*
- ✓ *RobertS.Pindyckand DanielRubinfeld: Microeconomics,8th Edition,Pearson*
- ✓ *H. L. Ahuja (2018): Advanced Economic Theory. Twenty-First Edition, Sultan ChandPublication*

Core I   9.Macroeconomics II

Course Description
This paper deals with growth models and the classical school of thought, and its evolution into Keynesianeconomics.Thestudentsareintroducedto long-rundynamicsingrowth andtechnical 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 policyin 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.

UnitI:Economicgrowth model:
Accumulation of capital in the basic Solow model; supply and demand for goods, growth in the capitalstock andthe steadystate,Goldenrulelevelof capital, comparingsteadystates, 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

UnitII:ClassicalandKeynesianMacroeconomic thought
Classical macroeconomics, Employment and output determination: Say's law; the quantitytheory 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 whatways the Classical and Keynesian schools of economic thought differ from each other.

Unit III:OpenEconomyandMacroeconomicpolicies
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,theinterdependentnature ofkeymacroeconomicvariables,sectors,andmarkets,andthedynamicsof 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 Rebmann 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*

Core 1   **10. StatisticalMethodsfor 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 measureof therelationship between variables, which arethe coreof economicanalysis. 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 continuousrandom variables, and introduces the most frequently used theoretical distribution, the Normal distribution.

Course Outcomes:
- Tosummarizedataeffectivelyusingmeasuresofcentraltendency,dispersion,andgraphical techniques.
- Toanalyze relationships betweenvariables throughcorrelationandregressionanalysis.
- Tounderstand andinterpret timeseries databyidentifyingtrends and seasonality.
- Toapplyprobabilitytheoryandsamplingtechniquestosolvestatisticalproblemsand assess data validity.

UnitI:DataCollectionandMeasuresofCentralTendencyandDispersion
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; Measuresof Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relativemerits 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.

UnitII:CorrelationandRegressionAnalysis
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: Thismodule shall help studentsmaster the techniques to measure the strength and direction of relationships between variables (correlation) and use linear regression analysis to model and predict those relationships.

UnitIII:TimeSeriesandIndexNumber
TimeSeries:definitionandcomponents,measurementofthetrend-freehandmethod,methodsof semi-average, moving average and method of least squares (equations of first and second degree only),measurementofthe seasonalcomponent; Index Numbers:Concept,pricerelative,quantity relative and value relative; Laspeyer'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.

UnitIV:ProbabilityTheoryandSampling

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.

BasicReadings and Textbooks:
✓   *S.C.Gupta(2017): FundamentalsofStatistics,Himalaya PublishingHouse,Delhi*

ReferenceBook:
✓   *MurrayR. Speigel(2017):Theory&Problems of Statistics,Schaum'spublishing Series.*
✓   *ALNagar&RKDas(1983):Basic Statistics.Oxford UniversityPress.*

Core I   11.DevelopmentEconomicsI

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 statein 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.
- Ithelpsstudentslearnaboutaggregatemodelsofgrowth.
- It examines the axiomatic basis for inequality measurement and explores the connections between growth and inequality.
- Itfamiliarizesthestudentswiththesocio-economicandpoliticalinstitutionswhileshowing their contribution to economic development.

UnitI:StudyofEconomicDevelopment
Conceptions of Development economic growth and economic development; Alternativemeasuresofdevelopment,documentingtheinternationalvariationsinthesemeasures,comp aring 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: Uponcompletionof thismodule,studentslearnthealternativeconceptsassociatedwiththedevelopmentand the changes in the measurement of development over time.

UnitII:TheoriesofEconomicGrowthandDevelopment
 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 forthby different Schools of Economics.

UnitIII:Poverty,Inequality,Agriculture,IndustryandDevelopment:
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 leraners 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.

UnitIV:InstitutionsandEconomicDevelopment:
 Role of institutions in economic development; Characteristics of good institutions and qualityof 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.

Text book:
- ✓ *Todaro,MichaelPandStephenCSmith(2006):EconomicDevelopment,8ᵗʰEdition, Pearson*

ReferenceBooks:
- ✓ *DebrajRay(2009):DevelopmentEconomics, OxfordUniversityPress.*
- ✓ *Thirlwall,AP(2011):EconomicsofDevelopment,9ᵗʰEdition,PalgraveMacmillan*

Core I   **12.MathematicalMethodsforEconomicsII**

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 transmitthe 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 theends, but the means for illustrating the methodof applying mathematical techniques toeconomic theoryin general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Course Outcomes:
- Tousemathematicaltechniquestoanalyze economicproblems.
- To havean understandingof theinput-output models.
- Tobeabletousesecondandhigher-orderderivativesandintegrationtoanalyzethe nature of functions.
- Todeveloptheabilitytooptimiseobjectivefunctionssubjecttosatisfactionof constraints.

UnitI:Linearmodels:
Input-OutputModel:BasicconceptsandstructureofLeontief'sopenandstaticInput-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.

UnitII:SecondandHigherOrderDerivativesandIntegration:
Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points ofinflection, 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 modulewillenablethestudents to know the conceptofhigher-order derivativesandintegration,definite and indefinite; and the applications of higher-order derivatives and integration in Economics.

UnitIII:SingleandMultivariable Optimization:
Optimum values and extreme values; Relative maximum and minimum; Necessaryversus sufficient conditions - First and Second derivativetests (usingHessian 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.

UnitIV:OptimizationwithEqualityConstraints:
Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable singleconstraintcaseonly):Firstandsecondordercondition;TheBorderedHessiandeterminant.

LO:This modulewillenable thestudentto understandthe meaning anddefinitionofconstraintoptimization,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.ChiangandK.Wainwright(2005):FundamentalMethodsofMathematical Economics, McGraw Hill International Edition.*

ReferenceBook:

- ✓ *K.SydsaeterandP.J.Hammond(2002):MathematicsforEconomicAnalysis.PearsonEducational Asia*
- ✓ *EdwardT Dowling(2004): IntroductiontoMathematicaleconomics, Tata McGeaw-Hill, Third Edition.*
- ✓ *Taro Yamane (1995):Mathematicsfoe Economists: Anelementarysurvey.New Delhi Prentice Hall. Second Edition.*

Core I 13. History of Economic Thought

Course description

This course provides a perspective to our intellectual history, development of economic thought and helpsrelatethistothecurrentthinking. Itintroducesthestudentstothephilosophersand economists whodevelopedeconomicreasoningandmodelingof economicactivities.Italsohelps 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.
- Exploringthecontrastingtheoreticalapproachesofdifferenteconomists.
- Understanding the historical evolution of Indian economic thought and its comparison with Western economic thought.

UnitI:IntroductionandEarlyEconomicThought

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.

LO:ThismodulesummarizesthecontributionsofAdamSmith,DavidRicardo,andThomastothefieldofeconomics.

UnitII:ClassicismVsMarxism

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.

LO:Thismoduleshallenablethestudentstogetgeneralinsightsintothetwoschoolsofthought,namelythe Classical and Marxian.

UnitIII:TheMarginalists' 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.

LO: This module will help the students in gaining knowledge and understanding of the development of ideas within the field of economics and get a deeper understanding of the Marginalists' Revolution.

UnitIV:IndianEconomicThought

Main themes of Kautilya'sArthasashtra; Modern Economic Ideas: Dada BhaiNaoroji, M.K. Gandhi, village swaraj, non-violence, machines and labour, cottage industries; Comparison ofIndian Economic thought with western Economic thought.

LO:ThismoduleaidsthestudentinevaluatingtherelevanceandapplicabilityofIndianeconomicthoughtin

contemporarytimes.

TextBooks
- ✓ *Gide,CharlesandRist,Charles(1973):AHistoryofEconomicDoctrines,Oxford University Press.*
- ✓ *Dasgupta,AK(1986):EpochsofEconomicTheory,OxfordUniversityPress,NewDelhi.*

ReferenceBook:
- ✓ *O'Brien,DP(1975):ClassicalEconomists,Oxford,ClarendonPress.*
- ✓ *Ekelund,RobertB.andRobertF.Hebert(1990):AHistoryofEconomicTheory and Method, third edition, New York: McGraw Hill.*
- ✓ *HenryW.Spiegel(1991):TheGrowthofEconomicThought,3rded.Durham:Duke University Press*
- ✓ *TomBottomore(1980):DictionaryofMarxistThought,BasicBlackwellPublishers.*
- ✓ *Roll,Eric,HistoryofEconomicThought, FaberandFaberLtd.*
- ✓ *LNRangarajan(1992):Kautilya:TheArthasastra,edited,rearranged,translatedandintroduced; Penguin Books, New Delhi.*

Or
MoneyandBanking

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:
- Understandingmoneyanditstypesalongwiththeirfunctionsanddifferentmeasuresof money supply.
- Understanding the basic concepts of banking, and its functions and to examine the bankingscenario in India.
- Togainknowledgeofthefunctionsofcentralbanksandmonetarypoliciesandhowthey have evolved.
- Get an understandingof the conceptual framework of the financial market and institutions of India.

UnitI: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 ofmoney, and monetary aggregates.

Unit II:CommercialBanking

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; Lessonsfrom Global Financial Crisis and Policy Response in India.

LO:ThismodulewillmakethestudentsawareofbasicsofcommercialBankingand Finance.

Unit III:CentralBanking

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:Uponcompletionofthismodule,studentswillbeabletoappreciatetheeffectsofthemajorpolicytoolsand understand how central banks affect the financial system of the economy.

UnitIV:FinancialMarkets

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:Thismoduleshallhelpstudentstounderstandthenatureoffinancialinstrumentsandtheirusage.

TextBook
- ✓ *Bhole,L.M.(2017):FinancialinstitutionsandMarket,6thEd,TataMcGrawhill,New Delhi.*
- ✓ *Mishkin, F. S. & Eakins S. G (2017): Financial Market andInstitutions, 8th Ed, PE, NewDelhi.*

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

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:
- Toobtain abasic overview ofthe economyof Odisha in thepre-Independenceperiod.
- ToanalyzethestrengthsandweaknessesofthemacroeconomicscenarioofOdisha'seconomy.
- Togainanunderstandingoftheimportanteconomicsectorsof Odishaandthechallenges faced by them in recent times.
- Tograsp thecurrenteconomicproblems in Odisha.

UnitI:OdishaEconomybefore 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.

LO: This module will ensure that the students understand the features of Odisha's economy in the pre-independence period.

UnitII:MacroEconomyof 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.

LO:ThismodulepresentsthegroundrealitiesofOdisha'smacro-economicsituationtothestudents.

Unit III:Agriculture,Industry,InfrastructureandEnvironmentinOdisha

Agriculture:land ownershipandland tenure,agriculturalwages andrural 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

LO: Upon successful completion of this module, students will be able to appreciate the importance and contribultion of two important sectors, agriculture and industry, to Odisha's Economy.

UnitIV:Social Sectorin Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health,NRHM;education:Literacy,Primaryeducation,secondaryeducation,highereducation,   SSA; human development

LO:ThismodulepresentsthesalientfeaturesofthesocialsectorinOdishatothestudents.

Text Readings

- ✓ *Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): The Economyof Odisha: A Profile, Oxford University Press, New Delhi*
- ✓ *GoO(latest):EconomicSurvey,PlanningandCoordinationDirectorateofEconomicand Statistics, Bhubaneswar*

AdditionalReading

1. GoO(2004):*HumanDevelopmentReport2004Orissa*,PlanningandCoordinationDepartment, GoO, Bhubaneswar
2. Mahapatro,S.B.(1980):Inter-IndustryWageDifferentialsinOrissa:AnEmpirical Analysis, *Indian Journal of Industrial Relations*, 15(4): 525-536.
3. Vyasulu,V.andArun,A.V.(1997):IndustrialisationinOrissa:TrendsandStructure, *EconomicandPoliticalWeekly*,32(22):M46-M53.
4. Das, Binod S. (1976): Orissa's Economy in the Nineteenth Century, *Social Scientist*, 4(11):32-46.
5. Das,BinodS.(1976):Orissa'sEconomyintheNineteenthCentury:PartTwo,*SocialScientist*, 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):NewEconomicPolicyandDevelopmentofBackwardRegions:A Note on Orissa, *Economic and Political Weekly*, 28(19): 939-941.
8. Mohanty,B.(1993):OrissaFamineof1866:DemographicandEconomicConsequences, *EconomicandPoliticalWeekly*,28(1/2):55-66.
9. Haan,A.deandDubey,A.(2005):Poverty,Disparities,ortheDevelopmentof Underdevelopment in Orissa, *Economic and Political Weekly*, 40(22/23): 2321-2329.
10. Samal,K.C.(1998):PovertyAlleviationafterPost-Liberalisation:StudyofaTribalBlockin Orissa, *Economic and Political Weekly*, 33(28): 1846-1851
11. Nayak, P. and Chatterjee, B. (1986): Disguised Unemployment in Agriculture: A CaseStudy of Rural Orissa, *Indian Journal of Industrial Relations*, 21(3): 310-334.

Core I **14. Introductory Econometrics**

Course Description:
This course provides a comprehensiveintroductionto basic econometricconceptsand 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:
- Tohavea comprehensiveintroductiontobasiceconometricconceptsand techniques.
- Togainanunderstandingofthestatisticalconceptsofhypothesistesting,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.

UnitI:Introduction
Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Binomial, Poisson and Normal distributions: their properties. TheoryofEstimation:Estimationof parameters;propertiesofestimators–smallsampleandasymptotic properties; point andinterval estimation.

LO:Thismodulewillenablethestudentstoknowaboutsomecommondiscreteandcontinuoustheoreticalprobability distributions; and to know about estimators, point and interval, and the desirable properties of point estimators.

UnitII:HypothesisTesting
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; Powerof 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 testingof hypothesis; and have an understanding of type I and type II errors in the procedure of hypothesis testing.

UnitIII:LinearRegressionAnalysis
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.

UnitIV:ViolationofClassical 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);―BasicEconometrics‖,McGrawHillBookCo.*

ReferenceBook:

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

Or
PublicEconomicsI

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 ofreceipts of the government.
- Studentswillbeabletounderstandtherationalebehindthepublicprovisionofspecific 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.

UnitI:IntroductiontoPublic FinanceandPublic Budgets
The concept of Pareto Optimality.Pareto improvement and potential Pareto improvement. Public good verses 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; Budgetas 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 challengesfaced 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 thepublic 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, taxablecapacity, 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.

UnitIV:PublicDebt

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

LO:Thismodulewillgiveafairideaofdifferentaspectsoftheimplicationsofpublicdebtontheeconomy

TextBooks:
- ✓ J.HindriksandG.Myles(2006):*IntermediatePublic Economics*,MITPress.

ReferenceBook:
- ✓ R.A.MusgraveandP.B.Musgave(1989):*PublicFinanceinTheoryandPractices.* McGrawHill
- ✓ BhatiaH L(2018):*PublicFinance.* VikasPublishingHouse.

Or
DevelopmentEconomicsII

Course Description:
This is the second Module of the economic development sequence. It begins with basicdemographic 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.
- Itwillinstilltheabilitytopresentanewinterpretationofthedualisticstructureofaneconomy and its implication for economic development.
- Thecourse will give an in-depth understanding of environmental economics and application of economic principles to resolve specific environmental problems and issues.
- Itwillequipthestudentswithanabilitytoexplainthephenomenonofglobalization,the economics, and the politics of international agreements, trade, and production patterns.

UnitI:PopulationandDevelopment
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 growthand the model of low-level equilibrium trap; rural-urban migration – the Harris Todaro migration model and policy implications.

LO: Upon successful completion of the module, the students will learn about the basic demographic concepts of birth and death rates, age structure, fertility and mortality, demographic transition and development, fertility choices and human capital formation, and migration models.

UnitII:DualismandEconomicDevelopment
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.

LO: This module shall provide an understanding of the various concepts of dualism and the manner it has hindered the development of developing countries.

UnitIII:Environmentand 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.

LO: Thismoduleshallhelp studentsgetting anidea abouttheglobalperspectivesoncontemporaryenvironmentaland natural resource issues and appropriate economic concepts for analyzing them.

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.

LO: The learners shall acquire an understanding of the linkage between International Trade and Economic Development, and trade strategies for development.

TextBook:
- ✓ *Todaro,MichaelPandStephenCSmith(2006):EconomicDevelopment,8ᵗʰEdition,Pearson*

ReferenceBook:
- ✓ *Thirlwall,AP(2011):EconomicsofDevelopment,9ᵗʰEdition,PalgraveMacmillan.*

Core I   **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:
- Tounderstandtheusesof computersandtheirapplicationsin Economics.
- Todevelop professional competencyinworkingwithMS Office.
- Toget hands-onuseof Microsoft Officeapplications-Word,Excel, PowerPoint,and Access.
- To gain basic soft skills in handling data, creation, and formatting of Word documents, and making presentations.

UnitI: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:Thismoduleshallmakethestudentsunderstandthebasicsofcomputers–parts,memory,network,andinternet.

UnitII:MSWord,PowerPoint,andAccessApplications
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.

UnitIII:Worksheet &MSExcel
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 yourchart;ChartsStyles and Layouts;ChartTitlesandSeriesTitles;FormatchartPanel;Add labels to a Chart; Format chart segments; Format Axis titles; Format your Axis titles

LO:Uponcompletionofthismodule,studentsshalldeveloptheabilitytoarrangedatainspreadsheetsusing

graphingtools,pivottables,andformulas.

UnitIV:MS-Excel BasicFunction

Basiccalculations:Sum,Sqrt,Max,Min,Count,Averages,Rank;Conditionalandlogicalfunctions: IF, AND, OR; Estimation of correlation and regression; Hypothesis testing: t-test, F-test and Z-test ExcelPivotTables;TheLOOKUPFunction;TheVLOOKUPFunctioninExcel;Hyperlinksin Excel

LO:Thismoduleshallenablethelearnertoanalyze datausingMSExcelfunctions.

Text Books:

- ✓ *NewPerspectivesMicrosoftOfficeExcel2016,ComprehensiveEnhancedEdition,byParsons, et al, Nelson Publisher.*
- ✓ *Sinha,P.K.(2004):ComputerFundamentals, $6^{th}Ed$,BPBPublications,New Delhi.*

ReferenceBook

- ✓ *RajaRaman.V. (2014):FundamentalsofComputers, $6^{th}Ed$,PHI,NewDelhi.*
- ✓ *KernsR.L.(1992):EssentialsofMicrosoftWindows, WordandExcel,PHI.*
- ✓ *AlexisLeon&MathewsLeon: IntroductiontoComputers withMs-Office,TMH.*

Or

EnvironmentalEconomics

Course Description
Thiscourseintroducesthestudentstothebasicsofenvironmentaleconomicstounderstandthe fundamentals of environmental concerns and develop insights into valuation of environment.

Course Outcomes:
- TounderstandthebasicconceptsofEnvironmental Economics
- Tobeableto analyseandapplythe concepts to understandspecificcasestudies.
- Todevelopinsightsinto thevaluationoftheenvironment.
- To become capable toexecute/create the Projector fieldassignmentasper the knowledge gained in the course.

UnitI:Economyand Environment
Concepts of Environmental Economics, Natural Resource Economics, and Ecological Economics. Important environmental Problems (Air pollution, water pollution, deforestation, climate changeand 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 wellbeingof thepeople and otherlivingbeings, 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.

UnitII:TheEconomicsofPollutionandClimate 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 housegas externality,lackofincentivesfordevelopinglow carbon technology),policymeasures 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.

UnitIII: ValuationofEnvironment
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 valuationof environment (Thehedonicpriceapproach,Travel Costapproach)

ContingentValuation method.

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

UnitIV:NaturalResourcesandSustainableDevelopment

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,EconomicandEnvironmental),Daly'soperationalprinciplesforsustainability, Sustainable Development Goals (SDGs).

LO: Thismodule shall initiate an understanding of the limitsof the use of natural resources from the pointof view of their sustainability and Sustainable development.

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

ReferenceBook:
- ✓ *Kolstad,C.D(1999):EnvironmentalEconomics.OxfordUniversityPress,NewDelhi*

Or
InternationalEconomics

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:
- Tounderstandthebasicconcepts/principlesof InternationalTradeandFinance.
- Toacquiretheabilitytoanalysetheconceptstounderstandspecificcasestudiesand practical issues.
- Todevelop insights into tradepolicyand balanceof payments.
- Todevelopan insightintotheinternationalfinancialsystem andthetradepolicyofIndia.

UnitI:Importanceof TradeandTradeTheories
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 intensityof 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.

LO:Thismoduleshallendowtheknowledgeofthedifferenttradetheoriestothelearners.

UnitII: 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.

LO: Upon successful completion of the module, students shall get an understanding of the different tools used by the Government to intervene in trade and their welfare implications.

UnitIII:ExchangeRateandInternationalmonetarysystem
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 exchangerate;IMF:ObjectivesofIMF,IMF'sassistancetomembercountries(RapidFinancing

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

LO: Thismodule will be useful for the students in getting to knowabout the exchange rate and theories relating to its determination and gaining knowledge of the different international financial institutions.

UnitIV:Balance ofPayments
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.

LO: This module shall enable an understanding of the concept of disequilibrium in Balance of Payment (BOP) and the different measures for correcting the same.

Text Book:
- ✓ *MannurH.G(2018), InternationalEconomics,VikashPublishing/SultanChand*

ReferenceBooks:
- ✓ *SalvatoreDominick(2016),InternationalEconomics,Wiley India.*
- ✓ *SoderstenBo andReedJ(1994), InternationalEconomics,McMillanPublisher*
- ✓ *DwivediD.N.(2013),InternationalEconomics:TheoryandPolicy,VikashPublishing.*

Core I   **16. QuantitativeMethods**

Course description

This course is a continuation of the Mathematical methods for Economists courses in semesters IV and V. It aims to train the students to use the techniques of mathematical and statistical analysis, which are commonly applied to understand and analyze economic problems. It aids in learning the classical techniques involving functions and calculus, to gain knowledge about the elements ofGame Theoryas applicable to real lifeeconomic analysis and to initiate students into samplingtools and techniques, data collection, analysis, theory of estimation and hypothesis testing

Course Outcomes:

- To use the techniques of mathematical and statistical analysis, which are commonly applied to understand and analyze economic problems.
- Learningthe classicaltechniques involvingfunctionsand calculus.
- Gaining knowledge about the elements of Game Theory as applicable to real-life economic analysis.
- Tomakeuseofsamplingtoolsandtechniques,datacollection,analysis,theoryof estimation, and hypothesis testing.

UnitI

Functions: Multivariable functions – Production functions; Partial derivatives; Total differential; Total derivatives; Jacobian and functional dependence. Quadratic forms; Optimization – Hessianand constrained optimization – bordered hessian- Economic applications;

LO: This module will enable the student to understand and apply the concept of multivariate functions to analyze production functions; and optimize functions with and without constraints.

UnitII

Game theory - Concept of Game, Types of Game, Two-persons-zero sum game, Nash Equilibrium, Prisoner's dilemma.Maximin - minimax principle; Saddle point solution, Dominant Strategy,Mixed Strategies; Graphical solution of 2 x n and m x 2 Games; Linear programming – Graphical solution to a linear programming

LO: This module will enable the student to know basic concepts of the Theory of Games, Nash equilibrium, saddle points for a two-person zero-sum game, and hence the value of the game. It will explain the concepts of mixed strategy technique using the probability approach; Linear Programming Problems, basic components, and assumptions; the notions of formulating a Linear Programming Problem with its economic applications and graphical solutions thereof.

UnitIII
Random variable and its probability distribution, probability mass function and probability density function, expectation and variance of a random variable, laws of expectation and variance.
Theoretical probability distributions: Binomial, Poisson, and Normal probability distributions and their properties; Normal approximation to Binomial; Joint, marginal, and conditional probability distributions, independence of random variables, covariance, results on expectation and variance.

LO: This module will enable the students to understand random variables, discreet and continuous, and their probability distribution; and understand specific theoretical distribution and their applications.

UnitIV
Concept of an estimator and its sampling distribution; desirable properties of an estimator; Interval estimation; statistical hypotheses- null and alternative; Type I and Type II errors; power of a test, confidence intervals and hypothesis testing based on z, t, chi-square and F-distributions.
 Methods of estimation of non-linear equations: parabolic, exponential, modified exponential, Gompertz and logistic relationships

LO: This module will enable the student to understand the concepts of estimation, point, and interval, as well as estimators and hypothesis testing; and methods of estimation of specific non-linear equations.

Text Reading:
- ✓ *Chiang,A.C.(1986):FundamentalMethodsofMathematicalEconomics,McGraw Hill.*

Suggested References:
- ✓ *Gupta,S. C. (1993):Fundamental Methodsof Applied Statistics,S.Chand & Sons.*
- ✓ *Speigel,M.R.(1992):Theory&ProblemsofStatistics, McGrawHillBookCo*
- ✓ *Yamane,Taro(1975):MathematicsforEconomists,PrenticeHallof India, NewDelhi.*
- ✓ *Mukherji&Guha (2011): Mathematical Methods & Economic Theory, Oxford UniversityPress*

Core I   17. ResearchMethodology

Course description

The course intends to develop a research orientation among the students and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.

Course Outcomes:
1. GettinginitiatedintoSocialScienceResearchandresearchprocess,andthetheoretical perspectives in social science research.
2. Addressingtheissuesinherentinselectingaresearchproblem,selectinganappropriate research design, and applying them in research/ project work.
3. Acquiringthe knowledge onmethodsofcollectionofdataandmeasurementofvariablesina broad structural sense.
4. Havinganideaofbasicethicalprinciplesforconductingscholarlyresearch andacquiringthe skills of writing research reports and implementing research projects/studies.

UnitI:Basics ofResearch

Introduction to Research: Meaning, Objectives, Motivation, Types, Approaches, Methods and Methodology, Significance, Research Process, Criteria of Good Research; Qualities of a Good Researcher,Researchasa Career.

LO:Thismoduleintroducesthebasicconceptsofresearchmethodologyinsocialscience.

UnitII:ResearchProblem

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem; Research Design: Meaning, Need, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs.

LO:Thismodulewillhelpthelearnertoselectanappropriateresearchproblemandresearchdesign.

UnitIII:IssuesinResearch

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Techniques of Measurement Tools, Scaling and Important Scaling Technique Research Ethics: codes and ethics, permissions to research, responsibilities, confidentiality, feedback,participatoryresearch;ResearchProposalandliteraturereview:researchproposal,review

ofliterature:stagesofreview,usingthelibraryandinternet,abstracting,wordprocessing, plagiarism, Concept of IPR.

LO: Upon completion of this module, the students shall have the basic knowledge of the concept of measurement in research, ethical principles of research and ethical challenges, and review of literature.

UnitIV:Actionsin Research

English in report writing: words, sentences, paragraph, writing style; The Report: improvingquality, sections, drawing conclusions, evaluation checklists, persistence; Common Citation Styles

LO:Thismoduleshallenablethelearnertowritegood-qualityresearchreports.

TextBook:
- ✓ *Kothari,C.R.(2004):ResearchMethodology:MethodsandTechniques,NewAge International Private Limited Publishers, New Delhi.*

ReferenceBooks:
- ✓ *Guthrie, G. (2010): Basic Research Methods, Sage Publications India Private Limited, New Delhi*

Core I   18. Basic Econometrics

Course description

This course intends to further the Introductory Econometrics course of semester VI and revisit the Classical Linear Regression Models and regression diagnostics. It will help the students to develop an intuitive understanding of the material that will allow these econometric tools to be utilized effectively and creatively. On successful completion of this Course, students will be able to learn various basic econometric methods, estimation methods and related econometric theories and apply these methods to data or econometric modeling techniques.

Course Outcomes:
1. Tofurtherthe IntroductoryEconometricscourseofsemesterVIand gointogreaterdetailsof the Classical Linear Regression Models and regression diagnostics.
2. Helpingthestudentstodevelopanintuitiveunderstandingofthematerialthatwillallow these econometric tools to be utilized effectively and creatively.
3. Learning various basic econometric methods, estimation methods, and related econometrictheories and apply these methods to data or econometric modeling techniques.

UnitI

Meaningandscopeofeconometrics;Twovariablelinearregressionmodel–itsassumptions,estimation of parameters and properties of estimators; Gauss Markov Theorem, Coefficient of determination; Analysis of Variance of two variable LRM.

LO:Thismodulewillenablethestudenttoapplythemethodofleastsquarestoestimatethetwo-variablelinear regression model and assess the results thereof.

UnitII

K–Variable LRM: Estimation of parameters, properties of estimators, Gauss–Markov theorem; Testing of significance of single co-efficient, Subset of Coefficients: ANOVA; Adjusted coefficient of determination.

LO:This module will enable the student to apply the method of least squares to estimate the general multi-variablelinear regression model and test the statistical significance of the results.

UnitIII

Prediction in two-variable and K–Variable LRM; Multicollinearity: Nature, detection,consequences, and remedy. Specification Errors and Measurement errors.Heteroscedasticity: Meaning, Consequences, detection, and remedy

LO: This module will enable the student to understand prediction in a two and multi-variable linear regressionmodel; and gain an idea about the consequences and solution to violation of the least square assumptions like the absence of multicollinearity, correct specification of the model, correct measurement of variable, and homoscedasticity.

UnitIV

Generalized Least square and weighted least square estimation; Auto-correlation: Meaning, Detection, Consequences and remedy. Dummy variable models: Estimation; Testing the structural stability of regression models; Interaction effects; Seasonal analysis; Piecewise Linear regression

LO: This module will enable the student to gain an idea about the consequences and solution to violation of the least square assumption of absence of autocorrelation among errors; and understand dummy variables and their usage in regression analysis.

Text Reading

✓ *Johnston(1991):EconometricMethods, McGrawHillBook Co*

Suggested References

✓ *Koutsoyiarnis,A. (1992): IntroductiontoEconometrics,OUP*
✓ *Dougherty,C.(1992): IntroductiontoEconometrics,OUP.*
✓ *Kmenta,J. (1997):ElementsofEconometrics, Universityof Michigan Press*
✓ *Gujarati,D &Sangeetha(2007): BasicEconometrics,McGrawHillBookCo.*

Core I **19.Economicsof Growth and Development**

Course description
This course shall help the students learn the neoclassical growth models of Solow; Meade;Robinson; Kaldor and Pasinetti; render them capable of discussing Cambridge's criticism over the measurement of capital and understand the importance of endogenous growth theories which highlight human capital as an essential component for a country like India. It also aids in analyzing the investment decisions through investment criteria along with their merits and demerits.

Course Outcomes:
1. Understandingthe transition of growth theories acrossschools of thought, and developing an insight into the non-economic factors influencing growth.
2. To equip students to critically analyze selected models of endogenous growth and delve into their theoretical, empirical, and analytical framework.
3. Examining the important contribution of capital & technology to the process of growth and development.
4. Understandingthedynamicsofdevelopmentpolicies.

UnitI
Theories of Economic Growth: Neo-Classical Growth Models of Solow and Meade; Mrs. Joan Robinson's Growth Model; Cambridge Criticism of Neo-Classical Analysis of Growth – Controversy on the Measurement of Capital.

LO:Thismodulehelpsinacriticalunderstandingofthegrowthanddevelopmenttheoriesandmakingacomparative analysis of the models of growth.

UnitII
Endogenous Growth, Intellectual Capital, Role of Learning, Education and Research, Optimal Savings and Ramsay Model, Two Sector Growth Model of Ujawa

LO: This module helps in understanding how investment made in education and research and development can lead to the creation of new ideas, technologies, and innovations that can propel economic growth.

UnitIII
Growth Models of Kaldor and Pasinetti; Technological Progress – Embodied and Disembodied; Hicks- Harrod Neutrality Approach.Golden Rule of Capital Accumulation.

LO: Upon completion of this module, the student acquires the ability to appreciate Pasinetti's and Kaldor's contributions and the role of capital accumulation along with its implication in the progress of the economy.

UnitIV

Production Function Approach to Economic Growth; Total Factor Productivity; GrowthAccounting; Transitional Dynamics; Convergence Hypothesis; Inequality and DevelopmentReasons for a direct relation; reasons for an inverse relation; empirical studies. Human decision- making and development policy.

LO: This module makes the learner capable of understanding the way Total Factor Productivity growth contributes significantly to a country's transition and examines the growth-inequality relationships.

Text Reading

- ✓ *Todaro,M.P.(1994):EconomicDevelopment,LongmanPublishing,New York.*
- ✓ *Acemoglu, D. (1995): Introduction to Modern Economic Growth, Princeton University Press.*
- ✓ *Jones,C.I. (2001): IntroductiontoEconomicGrowth,W.W.Norton&Company, New York.*
- ✓ *Thirwal, A.P. (2003): Growth and Development: With special reference to Developing Economies, Palgrave MacMillan, New York.*
- ✓ *Jones,H.G.(1984):EconomicGrowth, V.N.ReinholdCompany,Ltd. England.*
- ✓ *Barro,R.J.&Sala–I–Martin,X.(2004): EconomicGrowth,PHI,NewDelhi.*
- ✓ *Vanden–Berg,H.(2001):EconomicGrowthandDevelopment,McGrawHill,New York.*
- ✓ *Basu, Kaushik (2003): Analytical development economics: The less developed economy revisited, MIT Press Cambridge.*
- ✓ *WorldDevelopmentReport2015:Mind,Society,andBehaviour*

Core I   **20. MicroeconomicsIII**

Course description

This course shall help the students in having a theoretical understanding of consumer behavior and decision-making and to get acquainted with recent advances in microeconomic theory and acquire the skills to apply the theoretical knowledge in research. It shall explore the Consumers' choice involving risk and uncertainty; Production function: types and properties; Theories of Cost and general equilibrium theory. The course also shall impart theoretical knowledge on distribution and welfare aspects of economic activities.

Course Outcomes:

1. Tohaveanunderstandingofthebasictoolsofreasoningappliedtoanalyzeconsumer behaviour and explore the Consumers' choices involving risk and uncertainty.
2. Gettingadeeperknowledge abouttheparadigmofneo-classicaleconomics.
3. Criticallyanalyzingthe marginal analysis.
4. Togainafair knowledgeaboutthedistributionand welfareaspectsof economicactivities.

UnitI

UtilityFunction, Lexicographic Ordering, Price & Income elasticities of demand, SlutskyEquation, Homogeneous and Homothetic utility functions; Theory of Revealed Preference, Strong Axiom of revealed preference; The Substitution effect; Consumers'choiceinvolving Risk and Uncertainty:N – M Utility Function, Utility – Expenditure duality, Inter-temporal consumption

LO: Thismoduleshallimpartonthe studentsanunderstandingof conceptslikeutilityfunction,preferenceordering, elasticity, Slutsky equation, Revealed preference theory, N-M Utility theory, duality in consumer theory, and inter-temporal consumption.

UnitII

Homogeneous production function, Cobb-Douglas, CES Production functions and their properties, multi-product firm and its equilibrium, Kuhn-Tucker conditions, duality in production, production under uncertainty, linear production functions

LO:Thismoduleshallhelpthestudentsexaminethecommonlyusedproductionfunctionsandfirm'sequilibrium

UnitIII

Critical evaluation of marginal Analysis: Baumol's sales Revenue maximization, Williamson's modelofmanagerialdiscretion,Marrismodelofmanagerialenterprise.Theoriesofcostandpricing: fullcost**,**averagecostandMarginalcostpricingtheories.LimitpricingtheoryofBain anditsrecent developments including Sylos-Labinis model.

LO: Thismoduleshallprovidea criticalunderstandingof marginalanalysisand exploremoderntheoriesof costand pricing.

UnitIV

Neo-classical Approach, Product exhaustion theorem, Euler's theorem, distribution theories in imperfect product and Factor markets. Pareto optimal conditions; B-S Social welfare function, Compensation criteria, optimum welfare under market imperfections and externality.

LO: This module shall ensure that the learner is ableto understand and explain Euler's theorem and theories of distribution in product and factor markets; and develops an understanding of concepts of social welfare function, the compensation criteria, and optimum welfare under externality and market imperfections.

Text Books
- ✓ *Henderson,J.M.&Quandt,R.E.(1980):MicroEconomicTheory–AMathematical Approach, McGraw Hill Co.*
- ✓ *Koutsoyiannis,A: ModernMicroeconomics,ELBS/Macmillan*
- ✓ *Gravelle,H &Rees,R(2004):MicroEconomics,3rd Edition,FTPrenticeHall,Pearson*
- ✓ *Mankiw,(2006):PrinciplesofMicroEconomics,CengageLearningIndia,NewDelhi*
- ✓ *Landsburg,S.E.(2008):Pricing,CengageLearningIndia,New Delhi*

ReferenceBooks
- ✓ *Varian,H.R. (1992):Micro EconomicAnalysis,WWNorton&Co.,New York.*
- ✓ *Maddala,G.S.&Miller,E(2004):MicroEconomics:TheoryandApplication,TataMcGraw Hill, New Delhi.*
- ✓ *Baumol,W.J.(1977):EconomicTheory&OperationAnalysis,PrenticeHallofIndia, New Delhi.*
- ✓ *Bilas,R.A.(1985):MicroEconomicTheory,McGrawHillPublishers.*
- ✓ *MichaelZ.Wetzstein(2013):MicroeconomicTheory:ConceptsandConnections,2nd Edition, Routledge*
- ✓ *Snyder, C & Nicholson, W (2008): Fundamentals of Micro Economics, Cengage learning, New Delhi.*

Core I   **21. Macroeconomics III**

Course description

This paper aims to analyze and establish the functional relationship between economy levelvariables and aggregates. It provides a proper understanding of macroeconomic theoreticalstructure. It tries to educate the students on an extended and advanced IS-LM framework with the explanations on trade cycles and the new classical approach along with policy implications.

Course Outcomes:

1. Enhancingthe understandingofwage-priceflexibilitywithdynamic stochasticsettings onan extended and advanced IS-LM framework.
2. Gaining conceptual clarity about the theoretical aspects, foundations, and principles of thetrade cycle theories.
3. Having a critical understandingof a new school of thought called _new classical approach to macroeconomics and its policy implication'.
4. Gaininganinsightintoandunderstandtheoriesandpracticesrelatingtofinancialintermediation.

UnitI:Extended IS-LM

Keynesian views on interest. The IS-LM model; Change in general Equilibrium: a change in investment, a change in the money supply, Extension of IS-LM model with government sector (government spending, taxation); Relative effectiveness of monetary and fiscal policies; Extension of IS-LM models with flexible wage and flexible prices, Wage-Price flexible with Pigou Effect and other effects.

LO:Thismoduleshallimpartclarityregarding wage-priceflexibilityinanextendedIS-LMframeworkalongwiththe effectiveness of monetary and fiscal policies.

UnitII:TradeCycleTheories

Meaning and Characteristics of Trade Cycles; its different phases; Theories of Trade cycle: Schumpeter, Kaldor, Samuelson, Hicks, Goodwin's model of Trade Cycle, Hawtrey's Monetary Theory,Hayek's Over-investment Theory and Keynes' views on Trade Cycles Control of business cycle

LO: This module shall help the learner in developing a clear and comprehensive understanding of the fluctuations in a nation's real GDP over time.

UnitIII:New classicalapproach

The new classical critique of micro foundations, the new classical approach; Policy implications of new classical approach – empirical evidence. Lucas Critique and the need for microfoundations; the Dynamic General Equilibrium (DGE) approach to macro analysis: optimization problem of a representative household; optimization problem of a representative.

LO: Upon completion of this module, the learners shall be able to bring out the implications of Lucas' critique and examine the microeconomic foundations of macroeconomic models.

UnitIV

Financialintermediation –amechanisticmodelofbankdepositdetermination;Abehaviouralmodel of money supply determination, a demand determined money supply process; RBI approach to money supply; money supply and open economy; control of money supply.

LO: This module shall impart an integrated overview of both theoretical and practical issues related to modern financial intermediation on the students.

Text Reading
- ✓ *Dornbusch,FisherandStarz (2018):Macroeconomics,13th Edition,McGrawHill*
- ✓ *RichardT.Froyen(2005):Macroeconomics,2ndEdition,PearsonEducationAsia,New Delhi.*
- ✓ *Edward Shapiro (2001):MacroeconomicsAnalysis- Galgotia PublicationPrivateLimited, 5th Edition, New Delhi.*
- ✓ *GregoryN.Mankiw(2010):Macroeconomics,7thedition,CengageLearningIndiaPrivate Limited, New Delhi*

ReferenceBooks:
- ✓ *R.LevacicandARebmann:MacroEconomics-AnIntroductiontoKeynesian-Neo- Classical Controversies*
- ✓ *Dwivedi,D.N.(2018):Macroeconomics-TheoryandPolicy.5thEdition,TataMcGraw Hill.*
- ✓ *Romer,D(2012): AdvanceMacroeconomics,NewYork,McGrawHill*
- ✓ *Acemoglu,D.(2009):IntroductiontoModerneconomicGrowth,PrincetonUniversitypress.*

Core I   **22.PublicEconomicsII**

Course description

This course aims to provide the students with thorough analytical understanding to analyze public goods, externalities, market failures; economics of government expenditure, taxation and public borrowing. It helps to critically analyze fiscal policies/finance and its implication in Indian Economy. On successful completion of this course, the students will be able to apply the principles of public economics in analyzing various government policies.

Course Outcomes:
- To understand the evolutionary roles of government and the challenges to derive the social preferences.
- Gettingeducationabout thetheoriesoftaxation,andoptimal directandindirect taxes.
- To have an understanding of ways the governments select public projects through cost-benefit analysis.
- Learning why and how powers should be decentralized for the effective provisioning of public goods and the role of the finance commission in India in transferring funds from the Union to state and local governments.

UnitI:RoleofGovernment

Role of government and fiscal functions-Allocation, Distribution and Stabilization branch; Private and public mechanism for allocating resources; Problems for allocating resources. Arrow's impossibility theorem; Median Voter Theorem

LO: This module will teach students the normative roles of the government and the challenges in aggregating the preferences of individuals to arrive at social preferences.

UnitII:Public Revenue

Optimal Taxation: Optimal commodity taxes, Optimal income taxes, Principles of tax equity–Benefit principle of taxation, Ability to pay principle, Efficiency of taxation- Excess burden and deadweight loss, Incidence of taxation- incidence under perfect competition- partial and general equilibrium analysis, incidence under monopoly. Gender Budgeting, Outcome Budgeting.

LO:Thismodulewillteachstudentsabouttheoptimaltheoriesofdirectandindirecttaxes,genderbudgeting,and

outcomebudgeting.

UnitIIIEvaluationof Public Expenditure

What is cost-benefit analysis, cost benefit analysis and externalities, and consumer surplus, Shadow pricing, Disco Moduleng and the cost of capital. Effects of public expenditure on production, distribution and economic activities; public sector pricing policy-average cost and marginal cost pricing, Criteria for public investment- Social cost benefit analysis

LO: This module will educate students about the decision-making process in case of public sector projects and the implications of government spending on the economy

UnitIV:BudgetandFiscalfederalism

Principlesofmulti-Modulefinance;Thedecentralisationtheorem, Theoryofclub goods, Tiebout hypothesis: Voting with your feet, Fiscal federalism in India- Vertical and horizontal fiscal imbalances, corrective measures; Constitutional provisions; Theory of Grants- matching vs non matching grant, general vs earmarked grants Latest Finance Commission Recommendations, Devolutionofresources and grants;Resource transfer fromUniontoStates –Criteria fortransfer of resources

LO: This module will teach students about the theoretical arguments formultitier government and their optimalsize. It will also teach the role of the finance commission in India in transferring funds from union to state and local governments.

Text Reading

- ✓ *Cullis,J.&Jones,P.(2009):PublicFinanceandPublicChoice.OxfordUniversity Press.*
- ✓ *Musgrave,R.A.&Musgrave,P.B.(2004):PublicFinanceinTheoryandPractice. Fifth edition, TATA McGraw-Hill*
- ✓ *Herber,B.P.(1967):ModernPublicFinance.RichardD.Irwin,Homewood.*
- ✓ *Stiglitz,J. E(2000)Economics ofthePublicSector.W WNorton*
- ✓ *Rangarajan, C. and D. K. Srivastava (2011) _Federalism and Fiscal Transfers in India'. Oxford University Press, New Delhi.*

Core I   23.EconomicsofSocialSector

Course Description

The course aims to acquaint and familiarize students with the economics of the social sector. The modules incorporated in this course provide an analysis of issues at the theoretical level and also with regard to the specificity of issues prevailing in the Indian context. The prime objective of the course is to expose the students to the issues and concerns of various social sectors in India

Course Outcomes:
1. To explore the relationship between education and the economyand identifythe major ways education contributes to economic growth.
2. Todevelopanunderstandingofplanning, financing,andcost-benefitanalysisof education.
3. To get introduced to the use of economic models to understand the behaviors of actors in the healthcare sector.
4. Togain ageneraloverviewofIndia'sHealthcareSector.

UnitI:IntroductiontoEconomicsof Education

Economics of Education: definition, methods, evidence and policy, Classical Economists and Education; Human Capital: historical root, uses, sources, values, investment in human capital; education and economic growth: dimensions, sources, contribution

LO:Thismoduleshallenablethestudentstounderstandhoweducationisrelatedtotheeconomy.

UnitII:InvestmentinEducation

Education Production Function: concept, estimation, role in policy analysis; Costs of Education: direct and indirect; Benefits of Education: types, measurement; Returns to Education: meaning,type, estimation

LO:Thismoduleshallexplainhowexpenditureoneducationcanlookeduponasaninvestmentanddiscussthe rationale for cost analysis in education.

UnitIII:TheDemandforandsupplyof HealthandHealthServices

Demand forHealthandhealthcare:concept,atheoreticalandempiricalinvestigation,determinants;

Economicsofmoralhazards;Supplyofhealthandhealthcare:concept,determinant;Health Production: concept and estimation; Health and Development: theory and evidences;

LO: This module shall provide an overview on basic economic theories and models applied to health care providerand shall correlate health with development.

UnitIV:OverviewofIndia'sHealth Sector

FeaturesofIndianHealthSector;HealthCareSysteminIndia:history,structure,programs, infrastructure, health information system; Public Health in India:Health Sector Reform in India.

LO:Uponcompletionofthismodule,thelearnerwillgetexposedtoIndia'shealthcaresystemandpublichealth.

Text Reading
- ✓ *Cohn, Elchanan (1972)*: **The Economics of Education**, *Lexington Books, D. C. Heath and Company, Lexington.*
- ✓ *Blaug,M.(1970):**AnIntroductiontotheEconomicsofEducation**,AllenLaneThe Penguin Press, London*
- ✓ *Zweifel,P.,Breyer,F.andKifmann,M.(2009):**HealthEconomics**,Springer-VerlagBerlin Heidelberg*
- ✓ *Rout,H.S.((2011):**HealthcareSystems:AGlobalSurvey**,NewCentury Publication, New Delhi*

AdditionalReading
- ✓ *Tu,P.N.V.(1969):The ClassicalEconomistsandEducation,Kyklos, 22(4):691-716.*
- ✓ *Blaug,M.(1985):WhereareWeNowintheEconomicsofEducation?,Economicsof Education Review, 4(1): 17-28.*
- ✓ *Levin,H.(1989):MappingtheEconomicsofEducation.AnIntroductoryEssay, EducationalResearcher,18(4):13–73.*
- ✓ *Machin,S.(2008):TheNewEconomicsofEducation:Methods,EvidenceandPolicy, JournalofPopulationEconomics,21(1):1-19.*
- ✓ *Schultz, T. W. (1961): Investment in Human Capital, American Economic Review, 51(1): 1-17.*
- ✓ *Kiker,B.F.(1966):TheHistoricalRootsoftheConceptofHumanCapital,Journalof Political Economy, October 1966, 481-99*
- ✓ *Sweetland, S. R. (1996): Human Capital Theory: Foundations of a Field of Inquiry, Review of Educational Research, 66(3): 341-59.*
- ✓ *Kiker, B. F. (1969): Von Thunen on Human Capital, Oxford Economic Papers, 21(3): 339- 43.*
- ✓ *Becker,G.S.(1962):InvestmentinHumanCapital:ATheoreticalAnalysis,Journalof Political Economy, 70(5): 9-49.*

Three Year Degree Course with Single Major and Two Minor

Semester	Core-I	Core-II	Core-III	Multi-disciplinary	AEC	SEC	VAC	Community Engagement & Services/ Field work /Internship	Total Minimum Credit
I	2X4=8	1X4=4		1X3=3	1X4=4 Odia		1x3=3 Environmental Studies and Disaster management		22
II	2X4=8		1X4=4	1X3=3	1X4=4 English	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	4x3=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
*The BOS in each subject has to design a course for improving skill in their field.
**Principles of Management can be offered as an option.