Students must secure minimum 192 credits for the award of the degree

Students are free to choose any course offered by other departments as soft core during a particular semester and advised to seek the help of concerned faculty advisor to choose the soft core course.

### SEMESTER I

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course Code</th>
<th>Course</th>
<th>Hard/Soft Core</th>
<th>Credits</th>
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<tbody>
<tr>
<td>1</td>
<td>ECON 111</td>
<td>Towards Understanding Economics</td>
<td>Hard core</td>
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<td>2</td>
<td>ECON 112</td>
<td>Statistical Methods I</td>
<td>Hard core</td>
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<td>3</td>
<td>ECON 113</td>
<td>Mathematics for Economists I</td>
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<td>Optional from other Departments</td>
<td>Soft core</td>
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### SEMESTER II

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<thead>
<tr>
<th>Sl. No.</th>
<th>Course Code</th>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>1</td>
<td>ECON 121</td>
<td>Microeconomics I</td>
<td>Hard core</td>
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<td>2</td>
<td>ECON 122</td>
<td>Statistical Methods II</td>
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<td>ECON 123</td>
<td>Mathematics for Economists II</td>
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### SEMESTER III

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<tr>
<th>Sl. No.</th>
<th>Course Code</th>
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<tbody>
<tr>
<td>1</td>
<td>ECON 211</td>
<td>Microeconomics II</td>
<td>Hard core</td>
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<td>2</td>
<td>ECON 212</td>
<td>Macroeconomics I</td>
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<td>3</td>
<td>ECON 213</td>
<td>Economics of Social Sector and Environmental Issues</td>
<td>Soft core</td>
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<td>Language I (other than English)</td>
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</table>
# M.Sc. Economics (Five year Integrated Programme)

## SEMESTER IV

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<thead>
<tr>
<th>Sl. No.</th>
<th>Course Code</th>
<th>Course</th>
<th>Hard/Soft Core</th>
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<tbody>
<tr>
<td>1</td>
<td>ECON 221</td>
<td>Monetary Economics</td>
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<td>ECON 222</td>
<td>Macroeconomics II</td>
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<td>ECON 223</td>
<td>Environmental Economics</td>
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## SEMESTER V

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<tr>
<th>Sl. No.</th>
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<th>Course</th>
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<tr>
<td>1</td>
<td>ECON 311</td>
<td>International Economics I</td>
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<td>2</td>
<td>ECON 312</td>
<td>Public Finance I</td>
<td>Hard core</td>
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<td>ECON 313</td>
<td>Elements of Econometrics</td>
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<td>ECON 314</td>
<td>Indian Economy I</td>
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<td>ECON 315</td>
<td>Development Economics</td>
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## SEMESTER VI

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<tr>
<td>1</td>
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<td>Indian Economy II</td>
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<td>ECON 324</td>
<td>History of Economic Thought</td>
<td>Hard core</td>
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<td>ECON 325</td>
<td>Indian Financial Institutions and Markets</td>
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## SEMESTER VII

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<tr>
<td>1</td>
<td>ECON 411</td>
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<td>ECON 412</td>
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<td>Econometric Theory</td>
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<td>ECON 415</td>
<td>Economics of Growth &amp; Development</td>
<td>Hard core</td>
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</table>
## M.Sc. Economics (Five year Integrated Programme)

### SEMESTER VIII

<table>
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<tr>
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<tr>
<td>1</td>
<td>ECON 421</td>
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<td>Applied Econometrics</td>
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<td>Public Economics</td>
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### SEMESTER IX

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<tr>
<td>1</td>
<td>ECON 511</td>
<td>International Trade and Finance</td>
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<td>2</td>
<td>ECON 512</td>
<td>Computer Applications in Economic Analysis</td>
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<td>ECON 513</td>
<td>Research Methodology</td>
<td>Hard core</td>
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<td>ECON 514</td>
<td>Indian Economy: Issues and Policies I</td>
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### SEMESTER X

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<tr>
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<tr>
<td>1</td>
<td>ECON 521</td>
<td>Indian Economy: Issues and Policies II</td>
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<td>2</td>
<td>ECON 522</td>
<td>Economics of Education</td>
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<td>ECON 523</td>
<td>Financial Economics</td>
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<td>ECON 524</td>
<td>Project/Viva</td>
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<td>ECON 525</td>
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</table>
M.Sc. Economics *(Five year Integrated Programme)*

Semester I

**ECON 111 – TOWARDS UNDERSTANDING ECONOMICS**

**Module 1: Exploring the Subject Matter of Economics**


**Module 2: Role of Markets, their Functioning and Welfare**

Markets and competition – determinants of individual demand/supply, demand/supply schedule and demand/supply curve, market versus individual demand/supply, shifts in the demand/supply curve – demand and supply together – how prices allocate resources – elasticity and its application – controls on prices – taxes and the costs of taxation – consumer, producers and the efficiency of the markets.

**Module 3: The Households**


**Module 4: The Firm and Perfect Market Structure**


**Module 5: Introduction to Macroeconomics and National Income Accounting**

The roots of macroeconomics – concerns over macroeconomic – the role of government in the macro economy – the components of the macro economy – the methodology of macroeconomics – concepts of national income – approaches to calculating national income – nominal and real income – issues on measurement of national income, the concept of black and green income.

**Readings:**

Module 1: Meaning, Classification and Tabulation of Data
Primary data and secondary data: definition, sources and method of collection – quantitative data: time series data, cross section data and pooled data – qualitative data – presentation of data (table) – Simple table, complex table (manifold table) – discrete frequency distribution table – continuous or grouped frequency distribution table – relative frequency distribution – cumulative frequency distribution: less than and more than – presentation of data (diagram): line diagram, bar diagram (simple and multiple), pie diagram – presentation of data (graph): graph of time series or line graph, logarithmic graph, graph of frequency distribution (histogram, frequency polygon, frequency curve, cumulative frequency curve / ogive).

Module 2: Measures of Central Tendency and Partition Values
Meaning of average – types of average: arithmetic mean (for raw data, ungrouped frequency distribution and grouped frequency distribution), median (for raw data, ungrouped frequency distribution and grouped frequency distribution), mode (for raw data, ungrouped frequency distribution and grouped frequency distribution), geometric mean, harmonic mean (along with formula for each type of average, respective merits, demerits, uses and properties) – quartiles (for individual series, discrete frequency distribution and frequency distribution with class interval) – deciles (for individual series, discrete frequency distribution and frequency distribution with class interval) – percentiles (for individual series, discrete frequency distribution and frequency distribution with class interval).

Module 3: Measures of Dispersion
Meaning of dispersion – types of dispersion: range, quartile deviation, mean deviation, standard deviation and variance (along with absolute measure, the relative measure or coefficient of each type of dispersion) – coefficient of variation – combined standard deviation – Lorenz curve (application in income distribution).

Module 4: Skewness and Kurtosis

Module 5: Moments
Definition of central moments (both for individual series and frequency distribution) – properties of central moments – raw moments (both for individual series and frequency distribution) – moment generating function – purpose of moments.

Readings:
Module 1: Preliminaries
Elements of logic and proof – converse and contra positive, necessary and sufficient conditions – proof by contradiction – mathematical induction – sets and set operations – ordered pairs, Cartesian products of sets – relations functions, one to one and onto functions, composite functions, the inverse function – the real numbers, natural numbers, integers, rational and irrational numbers – absolute value and intervals – inequalities.

Module 2: Elementary Linear Algebra
Two, three and n-dimensional row and column vectors – vector addition and scalar multiplication – length of a vector, scalar products, orthogonality – geometric representation, lines and planes in \( R^2 \) and \( R^3 \) – linear and convex combinations of vectors – linear independence – convex sets.

Module 3: Matrices and Matrix Operations
Addition, scalar multiplication, matrix multiplication – the transpose – the inverse of a square matrix – rank, elementary row operations and computation of rank – invertibility and rank for square matrices, characteristic roots and eigen values, Cramer rule.

Module 4: Determinants
Determinants – definition, properties, minors and cofactors – the Laplace expansion – expansion by alien cofactors – singularity and invertibility – the adjoint matrix and formula for the inverse.

Module 5: Elementary Topics in Calculus

Readings
M.Sc. Economics (*Five year Integrated Programme*)

Semester II

**ECON 121 – MICROECONOMICS I**

**Module 1: Introduction**

**Module 2: Consumer Behavior**

**Module 3: Theory of Supply and Production**

**Module 4: Theory of Cost**

**Module 5: Theory of Revenue and Equilibrium**

**Readings:**
3. N.G. Mankiw (2009), Economics : Principles and Application Cengage Learning, Printed in India
Module 1: Correlation
Concept of correlation – types of correlation – bivariate distribution and covariance – simple correlation – Karl Pearson’s product moment coefficient of correlation measure – partial correlation: definition and measure (ceteris paribus assumption) – multiple correlation: definition and measure (long run production function) – Spearman’s rank correlation coefficient (when ranks are given, when ranks are not given and when equal ranks are given) – properties and uses of correlation.

Module 2: Analysis of Time Series

Module 3: Regression Analysis

Module 4: Index Numbers

Module 5: Statistical Quality Control (SQC)

Readings:
### M.Sc. Economics *(Five year Integrated Programme)*

**Semester II**

<table>
<thead>
<tr>
<th><strong>ECON 123 – MATHEMATICS FOR ECONOMISTS II</strong></th>
</tr>
</thead>
</table>

#### Module 1: Functions of One Real Variable
Examples (linear functions, polynomials, etc.) and elementary curve types – Sets of points in the plane determined by equations or inequalities.

#### Module 2: Limits
Infinite sequence and series – the concepts of convergence and limits – algebraic properties of limits – present discounted values and elements of investment analysis – the limit of \( f(x) \) as \( x \to a \) – continuity – the intermediate value theorem.

#### Module 3: Advanced/Higher Calculus

#### Module 4: Problem of Optimization

#### Module 5: Applications in Economics
Examples of the use of the \( \exp \) and \( \log \) functions (proportional rates of change, elasticities, continuous compounding etc.) – the role of concavity and convexity – applications, profit maximization of firms, utility maximization and cost minimization using optimization – integration and its application in economics.

#### Readings
M.Sc. Economics *(Five year Integrated Programme)*
Semester III

<table>
<thead>
<tr>
<th>ECON 211 – MICROECONOMICS II</th>
</tr>
</thead>
</table>

**Module 1: Market Structure and Equilibrium**

**Module 2: Pricing Methods**

**Module 3: Factor Pricing**

**Module 4: Investment Analysis**
Payback period – average annual rate of return, net present value, internal rate of return, price changes, risk and uncertainty – elements of social cost benefit analysis.

**Module 5: Welfare Economics**

**Readings:**
5. N.G.Mankiw(2009), Economics : Principles and Applications, Cengage Learning, Printed in India
## M.Sc. Economics *(Five year Integrated Programme)*

### Semester III

<table>
<thead>
<tr>
<th>ECON 212 – MACROECONOMICS I</th>
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</table>

### Module 1: Nature and Scope of Macroeconomics

### Module 2: Employment and output in a growing economy
The goal of full employment – frictional and structural unemployment – unemployment and inadequate demand – the concept of potential output – factors affecting output – production and employment with economic growth – growth of actual and potential output

### Module 3: The Classical System
The classical revolutions – say’s law – quantity theory of money – wages, prices, employment, and production – rigid wages and monetary policy in the classical model.

### Module 4: The Keynesian Model
The problem of unemployment – the components of aggregate demand – equilibrium income – determination of equilibrium income – changes in equilibrium income – the role of fiscal policy and multiplier – the concept of balanced budget multiplier – exports and imports in Keynesian model.

### Module 5: Money, Interest and Income:
The money supply, money demand and interest rate – the relationship between bond prices and interest rates – the Keynesian theory of money demand and interest rate – the liquidity trap – the implications of increase in money supply.

### Readings
M.Sc. Economics *(Five year Integrated Programme)*  
Semester III

<table>
<thead>
<tr>
<th>Module 1: Conceptual Issues</th>
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<th>Module 2: Educational Economics</th>
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<th>Module 3: Health Economics</th>
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<tr>
<th>Module 4: Environmental issues</th>
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<tbody>
<tr>
<td>Causes and effects Of Environmental Degradation – Degradation of land, Forest and Natural Resources- Pollution from Energy –effects on health, Land , water and air- valuation of Environmental Damages- direct and indirect methods- Pollution Prevention , control and abatement - direct and indirect Instruments of Pollution Control – concept and indicators of sustainable development.</td>
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</table>

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<tr>
<th>Module 5: Policy issues in India</th>
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</table>

**Readings:**
Module 1: Definition, Functions and Theories of Money
Money and its function – the concepts and definitions of money – measurement of money – advantages of money – theories of demand for money: Classical approach, the transactions and cash balance approach, the Keynesian analysis, Post Keynesian developments, Monetarist approach.

Module 2: Money Supply

Module 3: Monetary Transmission Mechanism
Meaning – interest rate channel, credit channel, bank lending channel, balance sheet channel, exchange rate channel, other asset price channels.

Module 4: Monetary Policy
Instruments, targets, indicators, lags in monetary policy and rules versus discretion debate.

Module 5: Central Banking
Functions of a central bank – quantitative and qualitative methods of credit control – bank rate policy, open market operations, cash reserve ratio, selective methods, role and functions of Reserve Bank of India – objectives and limitations of monetary policy with special reference to India.

Readings
5. C Rangarajan (1999), Indian Economy: Essays in Money and Finance, UBSPD.
## M.Sc. Economics *(Five year Integrated Programme)*

### Semester IV

<table>
<thead>
<tr>
<th><strong>ECON 222 – MACROECONOMICS II</strong></th>
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<tbody>
<tr>
<td><strong>Module 1: Microeconomic Foundations</strong></td>
</tr>
<tr>
<td><strong>Module 2: The Closed Economy in the Short Run</strong></td>
</tr>
<tr>
<td>The goods market and derivation of IS curve – real influences and Shift in IS schedule – the money market and derivation of LM curve – the shift in LM curve – determination of equilibrium income and interest rates – the relative efficacy of fiscal and monetary policy.</td>
</tr>
<tr>
<td><strong>Module 3: The Aggregate Demand and Supply</strong></td>
</tr>
<tr>
<td>The derivation of aggregate demand and supply curves – the Keynesian aggregate demand with vertical aggregate supply curve – sources of wage rigidity and unemployment – the flexible price with fixed money wage model – labour supply and money wage – the shift in aggregate supply – Keynes vs. Classics.</td>
</tr>
<tr>
<td><strong>Module 4: Output, Inflation and Unemployment</strong></td>
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<tr>
<td><strong>Module 5: Open Economy Models</strong></td>
</tr>
<tr>
<td>The Mundell-Fleming model – determining equilibrium output in a small open economy – the monetary and fiscal policy under flexible and fixed exchange rates regimes – the Mundell-Flemming model with changing price level.</td>
</tr>
</tbody>
</table>

### Readings:
1. R T Froyen (2008), Macroeconomics, Theory and policies, Prentice Hall
Module 1: Theory and Concept

Module 2: Environment and Economics

Module 3: Environmental Problems

Module 4: Pollution Control

Module 5: Policy measures
Basic approach – design of environmental policy – Indian environment policies and performance – pollution control boards and their function.

Readings
2. S. Sankaran (1994) Environmental Economics, Margham, Madras
8. The Hindu survey of Environment: Annual Reports.
Module 1: Introduction to International Economics
Importance of international economics – international trade & economic growth – subject matter of international economics – purpose of international economic theories and policies – current international economic problems

Module 2: Theories of International Trade
Distinguishing features of internal and international trade – the pure theory of international trade-theories of absolute advantage, comparative advantage and opportunity cost – Heckscher-Ohlin theory of trade – factor price equalization theory – empirical relevance of the H-O theory

Module 3: Alternative Trade Theories
Vent for surplus approach – Kravis and Linders theory of trade – imitation gap and product cycle theory, role of dynamic factor in explaining the emergence of trade, trade under imperfect competition and increasing returns to scale – measurement of gains from trade and their distribution.

Module 4: Economic Growth and International Trade

Module 5: Gains from Trade
Meaning – factors determining the gains from trade – gains from trade and income distribution – measurement of gains from trade and their distribution – the gains from trade in the case of large and small country – free trade vs no trade – restricted trade vs no trade

Readings:
Module 1: Role of Government

Module 2: Taxation
Theories of taxation– ability and benefit principles of taxation (Lindhal) – Principle of maximum social advantage – taxable capacity – shifting and incidence – types of taxes – characteristics of good tax system.

Module 3: Public Expenditure

Module 4: Decentralization
Rationale for decentralization – economic, administrative and political – assignment of taxes and expenditure between various tiers of a federal government – rationale and role of local governments.

Module 5: Deficit Financing

Readings:
1. Goode, R. (1986), Government Finance in Developing Countries, TMH, New Delhi
Module 1: Nature and Scope of Econometrics

Module 2: Two Variable and Multiple Regression Analysis

Module 3: The Problem of Inference
The normality assumption – hypothesis testing about individual partial regression coefficients – testing the overall significance of the sample regression – testing the equality of two regression coefficients – restricted least squares – testing for structural stability of regression models – testing the functional form of regression.

Module 4: Relaxing the Assumptions of the Classical Regression Model
Multicollinearity – heteroscedasticity and autocorrelation: nature, consequences, detection and remedial measures.

Module 5: Regression on Dummy Independent Variables
The nature of dummy variables – regression on one quantitative variable and one qualitative variable – regression on one quantitative variable and one qualitative variable with more than two classes – regression on one quantitative variable and two qualitative variables – testing for structural stability regression models – interaction effects, piece wise linear regression, the use of dummy variables – time series analysis: some basic concepts – exposure to econometric packages.

Readings
Module 1: Indian Economy Prior to Independence

Module 2: Indian Economy at the Time of Independence

Module 3: Structure and Resources of Indian Economy

Module 4: Planning in India

Module 5: Indian Agriculture

Readings:
2. Dadabhai Naoroji (1990), Poverty and British rule in India, Low Price Publications.
6. Centre for Science and Environment(1982), The state of Indian Environment
7. Government of India, Economic surveys, Different years
8. Census of India, various issues.
M.Sc. Economics (Five year Integrated Programme)

Semester V

**ECON 315 – DEVELOPMENT ECONOMICS**

**Module 1: Nature and Scope of Development Economics**
Emergence of development economics – reasons, subject matter, nature and significance – role of values in development economics.

**Module 2: Economic Development (Meaning and Measurement)**

**Module 3: Economic Growth**
Modern economic growth – Kuznets six characteristics – relevance of historical growth experience to the under developed countries – contemporary UD countries – diverse structure and common characteristics.

**Module 4: Theories of Under Development and Development**
Theories of under development: vicious circle of poverty, low level equilibrium trap, circular causation and backwash effect, dualism, dominance and dependence – theories of development, classical theories ( Smith, Ricardo, Malthus), Marxian theory of capitalist development, Schumpeterian analysis of capitalism.

**Module 5: Strategies for development**
Big push – balanced vs unbalanced growth – Mahalanobis strategies – balance between agriculture and industry – import substitution vs export orientation – neo-liberal vs interventionist policies.

**Readings**
2. A.P. Thirwall (2005), Growth and Development: With Special Reference to Developing Economies, Palgrave Macmillan
M.Sc. Economics (Five year Integrated Programme)

Semester VI

ECON 321 – INTERNATIONAL ECONOMICS II

Module 1: Terms of Trade, Tariff and Protection

Module 2: International Economic Integration

Module 3: Balance of Payment
Meaning structure and components of balance of payment – equilibrium and disequilibrium in the balance of payment – consequences of disequilibrium in the balance of payment – balance of payment and balance of trade – causes and methods of its correction (both monetary and non-monetary measures and their relative merits and demerits).

Module 4: Review of National Income and Balance of Payment Accounting
National income accounts and Balance of Payments accounts: balance of trade, BoP on capital and current account, overall BOP, BOP accounting principles (credits & debits, double entry book keeping).

Module 5: Balance of Payment and Policy
Automatic adjustment mechanism under Gold Standard – Balance of Payment and national income – expenditure reducing and expenditure switching policies – direct control for adjustment – policies for achieving internal and external balance.

Readings:
M.Sc. Economics *(Five year Integrated Programme)*

Semester VI

**ECON 322 – PUBLIC FINANCE II**

**Module 1: Trend and Pattern of Public Revenues**

**Module 2: Trend and Pattern of Public Expenditure**

**Module 3: Basics of Budgeting**
Constitutional basis for budgeting – process of passing finance and appropriation bills in the parliament/assembly – CAG and PAC – FRBM – deficit, public debt and monetary management.

**Module 4: Centre State Financial Relationships**
Role of Finance Commission in filling vertical and horizontal fiscal imbalance – plan transfers and discretionary transfers – latest finance commission report of the union and state governments.

**Module 5: Recent Fiscal Reforms**
Latest commentary on India’s fiscal policy – tax reforms, expenditure pruning, constitutional constraints on deficit - fiscal and monetary policy nexus.

**Readings:**
1. Goode, R. (1986), Government Finance in Developing Countries, TMH, New Delhi
### Module 1: Indian Industries
Role of Indian industries – industrial development during the planning period – industrial policies – licensing policy – growth and problems of some large scale industries: iron and steel, cotton, jute, sugar and cement – growth and problems of small scale enterprises – role, growth and problems of public sector enterprises in India.

### Module 2: Indian Currency, Financial System and Public Finance
Indian currency systems today – sources of board of money (m3) : factors affecting money supply in India – progress of banking in India since 1969 – role of reserve bank of India in Indian economic development – competition of India’s capital and money markets – revenues and expenditure of central government – current central budget – revenue and expenditure of state government – financial relation between the centre and states.

### Module 3: Important Areas of Concern
Poverty and inequality in India – Rising unemployment, rising prices, industrial Relations – regional disparities – Environmental degradation-parallel economy.

### Module 4: Puducherry Economy

### Module 5: Planning, Government Finance and Development Issues of Puducherry

### Readings:
Module 1: Early Period

Module 2: Classical Period

Module 3: Marginalists

Module 4: J M Keynes and his Contributions

Module 5: Indian Economic Thought

Readings:
5. Haney(1977), Economic Thought
Module 1: Introduction to Money
Simple exposition to money demand and money supply – RBI and measures of money supply – commercial banks and credit creation – RBI control on money supply – time value of money and interest rates.

Module 2: Introduction to Indian Financial System

Module 3: Money and Capital Markets

Module 4: Foreign Exchange Market
Exchange rate – types – determination of exchange rate – nature of forex market – nature of forex inflow and outflow – examples of ECBs and NREs – RBI and exchange rate management.

Module 5: Financial Derivatives
Need for derivatives – types of derivatives – example of how stock index derivatives could be used to hedge risks in stock market investment – evaluation of financial derivatives.

Readings:
Module 1: Advances in Demand Theory
Modern utility analysis of Choices involving risk or uncertainty- Bernouli, Neumann Morgenstern, Friedman savage and Markowitz Hypotheses-Revealed Preference Theory and derivation of demand and indifference curve-Revision of Demand theory by Hicks-Logical Ordering-Recent developments in demand theory-Pragmatic Approach ( The Constant Elasticity of Demand function, The Dynamic Demand function, The Empirical Demand Function) The Linear Expenditure systems, the Indirect utility function, the Expenditure function, Lancaster’s Demand theory-Bandwagon effect-veblen efffect – Cobweb theorem, Lagged Adjustment in interrelated markets.

Module 2: Advances in Production Theory
Relation between returns to scale and returns to a factor- multi product firm- production function: Cobb Douglas ,CES, VES and Translog production function- Production function Vs production process-Technical progress and production function

Module 3: Advances in Theory of Costs and Optimisation
Traditional and modern theories of Costs-Empirical evidence- Derivation of Long run total cost curve from production function-Economics of Scale and Long Run Average Cost Curves

Module 4: Price and Output Determination
Marginal analysis as an approach to price and output determination: Perfect competition-short run and long run equilibrium of the firm and industry-price and output determination short run and long run-supply curve of the industry under perfect competition – Joint Demand and joint Supply – Composite demand and composite supply, Monopoly –short run and long run equilibrium, price discrimination – Degree of monopoly power- welfare aspects-monopoly control and regulation; Resource allocation under monopoly-Monopsony and Bilateral monopoly; Monopolistic competition-General and chamberlain approaches to equilibrium, equilibrium of the firm and group with product differentiation and selling costs, excess capacity under monopolistic and imperfect competition; Oligopoly-non collusive ( cournot, Bertrand, Edgeworth, chamberlin, Kinked demand curve and Stackelberg’s solution) and collusive (cartels and mergers, price leadership and basic point price system) models; workable competition – Structure, conduct and performance norms.

Module 5: Alternative methods of Pricing and Optimisation
Pricing principle – Average or full cost pricing- Mark up pricing- Limit pricing theory- Bains version- silos – Labini model of limit pricing- Public Utility Pricing- Game theory and price determination- Input output analysis – Linear Programming

Readings:
Module 1: Measuring Key Macroeconomic Variables

Module 2: Theories of Consumption

Module 3: Theories of Investment

Module 4: Theories of Money Demand

Module 5: Theories of Money Supply

Module 6: The IS – LM Model

Readings:
2. Errol D’Souza (2008), Macroeconomics, Pearson.
M.Sc. Economics (Five year Integrated Programme)
Semester VII

ECON 413 – MATHEMATICAL ECONOMICS

Module 1: Basic Calculus
Concept of function and types of functions – limit, continuity and derivative – Rules of
differentiation – Rules of partial differentiation and interpretation of partial derivatives –
Problems of maxima and minima in single and multivariable functions – Unconstrained and
constrained optimization – Applications of differentiation in economics – Concept of
integration – Simple rules of integration and its application to consumer’s surplus and
producer’s surplus – Growth rates and simple properties of time path of continuous variables.

Module 2: Linear Algebra
Determinants and their basic properties – Solution of simultaneous equations through
Cramer’s rule – Concept of matrix – their types, simple operations on matrices, matrix
inversion and rank of a matrix – Concept of vector – its properties – Matrices and vectors –
Concept of quadratic forms – Eigen roots and Eigen vectors – Introduction to input-output
analysis.

Module 3: Differential equations
Exponential growth – Separable equations – linear differential equations and integrating
factors – Second-order differential equations – Coupled equations, including the use of matrix
diagonalisation – Economic applications of differential equations.

Module 3: Difference equations
Solving first-order difference equations – Application of first-order difference equations to
financial problems – The cobweb model – Second-order difference equations – Coupled first
order difference equations, including the use of matrix diagonalisation – Economic
applications of second – order difference equations – Applications in trade cycle models –
Growth models and lagged market equilibrium models.

Module 5: Linear programming
Basic concept, formulation of a linear programming problem Its structure and variables –
Nature of feasible, basic and optimal solution – Solution of linear programming through
graphical and simplex method – Statement of basic theorems of linear programming –
Formulation of the dual of a programme and its interpretation – Shadow prices and their uses
– Concept of duality and statement of duality theorems – Concept of a game – Strategies –
simple and mixed – Value of a game – Saddle point solution – Simple applications.

Readings:
1 Sydsaeter, Knut and Peter Hammond (2006), Essential Mathematics for Economic
2 Yamane, Taro (1975), Mathematics for Economists, PHI, New Delhi.
Delhi.
5 Chiang, A.C. (1986), Fundamental Methods of Mathematical Economics, McGraw Hill,
New York.
M.Sc. Economics (Five year Integrated Programme)

Semester VII

Module 1: Regression Analysis

Module 2: The Problem of Inference
The normality assumption, Hypothesis testing about Individual Partial Regression coefficients, testing the overall significance of the sample regression, testing the equality of two regression coefficients, restricted least squares, testing for structural stability of regression models, testing the functional form of regression.

Module 3: Relaxing the assumptions of the Classical Linear Regression Model

Module 4: Regression on Dummy Variables
The nature of Dummy variables, regression on one quantitative variable and one qualitative variable, regression on one quantitative variable and one qualitative variable with more than two classes, regression on one quantitative variable and two qualitative variables, testing for structural stability regression models, Interaction effects, piece wise linear regression, the use of dummy variables- Binary choice model – LPM, problems in LPM, Probit and Logit Model

Module 5: Dynamic Econometric Models:

Readings:
# Module 1:
Modern economic growth – basic features, trends and patterns - relevance of historical experience to contemporary UD countries- limited relevance- factors for – differing initial conditions- role of international migration and international trade.

# Module 2:

# Module 3:
Approach to the study of economic development – linear stage theory, structural change models, Neo Marxian dependency approach, false paradigm model, dualistic approach, neo-liberal free market approach, endogenous growth theory.

# Module 4:

# Module 5:
Development and environment: Market based approach to environmental analysis, Harvesting of renewable nonrenewable resources, Measuring environmental values, economic growth and environment – sustainable development- policy measures. Ill effects- rain forest destruction, green house gases, global warming, climate change- policy- policy options in developing and underdeveloped countries.

## Readings:
2. Simon Kuznets, (1966), Economic Growth, Rate structure and Spread, Yale University Press.
5. Amartya Kumar Sen, Growth Economics, Penguin Harmondsworth
Module 1: Alternative Theories of the firm
Critical evaluation of marginal analysis; Baumol’s sales revenue maximization model; Williamson’s model of managerial discretion; Marris model of managerial enterprise; Behavioural model of Cyert and March

Module 2: Advances in Distribution Theory
Macro theories of distribution-Ricardian, Marxian, Kalecki and Kaldor’s -Staffa model-Neo-classical approach- Marginal productivity theory; Product exhaustion theorem; Elasticity of technical substitution, technical progress and factor shares; Theory of distribution in imperfect product and factor markets; Determination of rent, wages, interest and profit;

Module 3: Welfare Economics
Pigovian welfare economics; Pareto optimal conditions; value judgement; social welfare Function; Compensation principle; Inability to obtain optimum welfare – Imperfections, market failure, decreasing costs, uncertainty and non-existent and incomplete markets; Theory of Second Best- Arrow’s impossibility theorem; Rawl’s theory of justice, equity-efficiency trade off

Module 4: General Equilibrium Theories
Partial and general equilibrium; Walrasian excess demand and input-output approaches to general equilibrium existence- stability and uniqueness of equilibrium – general equilibrium, coalitions and monopolies; production without consumption- One sector model, homogeneous functions, income distribution; production without consumption-Two sector model, relationship between relative commodity and factor prices (Stopler Samuelson theorem), relationship between output mix and real factor prices, effect of changes in factor supply in closed economy ( Rybczynski theorem), production and consumption.

Module 5: Economics of Uncertainty
Individual behaviour towards risk, expected utility and certainty equivalence approaches, risk and risk aversion- sensitivity analysis, gambling and insurance, the economics of insurance, cost and risk, risk pooling and risk spreading , mean-variance analysis and portfolio selection, optimal consumption under uncertainty, competitive firm under uncertainty, factor demand under price uncertainty. The economics of search- different models, the efficient market hypothesis, stochastic models of inventory demand; market with incomplete information, search and transaction cost. The economics of information

Readings:
Module 1: The Labour Market

Module 2: Inflation and Unemployment

Module 3: Theories of Business Cycles

Module 4: The Post Keynesian Macroeconomics

Module 5: Recent Advancements in Macroeconomic Policies

Readings:
2. Errol D’Souza (2008), Macroeconomics, Pearson.
Module 1: Sampling Theory
Population and sample- Parameter and statistic-(Census method and sampling method of Data collection); Objects of Sampling- Methods of Sampling- Random and Non- Random; Techniques of sampling under each method- Sampling error and Non-Sampling error-Sampling distribution of a Statistic-Law of Statistical Regularity-Law of Inertia of Large Numbers-Central limit theorem

Module 2: Mathematical Expectation

Module 3: Theory of Estimation
Meaning and concept of an Estimation-Concept of Estimator-Types of Estimation-Point and Interval Estimation- Desirable properties of an Estimator-Standard error of Estimator-Confidence limits for a population parameter

Module 4: Theoretical Distribution
Definition-types of theoretical distribution-Discrete theoretical distribution-Binomial Distribution-Poisson distribution; Continuous theoretical Distribution-Normal Distribution-Standard Normal Variate -Z distribution; Other Theoretical Distribution-Students “t” Distribution-Chi-Square ($\chi^2$) Distribution- F-Distribution

Module 5: Statistical Inference
Formulation of Statistical Hypothesis; Testing of Hypothesis-Null Hypothesis and Alternative Hypothesis-Stages in Hypothesis testing-Types of Error in Hypothesis testing-Type I error and Type II error-Level of Significance and confidence coefficient-Critical region or rejection region; Two tailed test and one-Tailed Test; Computation of Test statistic and significance Test-small sample test- ‘t’ Test- $\chi^2$ test- F test; Large sample test- Z test; Test of Significance concerning correlation coefficient; Power of Test; Analysis of Variance

Readings:
ECON 424 – APPLIED ECONOMETRICS

Module 1: Applied Consumption Demand Analysis
Engel curves, complete demand models; general and particular restrictions on demand functions, specification, estimation and applications of complete demand systems; Measures of economic inequality.

Module 2: Production Analysis
Relationship among production, cost and profit functions, specification, estimation and applications; frontier production functions, measurement of multifactor productivity.

Module 3: Dynamic Economic Models
Role of lags in economics – Estimation of Distributed Lag models – Adaptive Expectation models – Partial adjustment model – Method of instrumental Variable – Autoregressive model – Durbin h test – Almon approach to Distributed lag models – Casualty in Economics. Difference and trend stationary processes; unit roots; co integration; Granger causality; macro econometric models and critical review of existing Indian macro econometric models after 1990.

Module 4: Applications of Qualitative and Limited Dependent Variable Models
The nature of Qualitative response model - Logit and Probit models, Tobit model, Multinomial Logit, Nested Multinomial Logit Model

Module 5: Panel Data Models
Introduction – Estimation of panel data models – Fixed effects model – random effect model.

Readings:
Module 1: Public Choice
Problems of preference revelation and aggregation of preferences; Voting systems; Arrow impossibility theorem; An economic theory of democracy; Politico-eco-bureaucracy; Rent seeking and directly unproductive profit seeking (DUP) activities.

Module 2: Rationale for Public Policy
Demand revealing schemes for public goods — Contributions of Clarks, Groves and Leyard, Tiebout model, theory of club goods; Stabilization Policy — Keynesian case for stabilization policy; Uncertainty and expectations; Failure of inter-temporal markets; Liquidity preference; Social goals; Poverty alleviation; Provision of infrastructural facilities, removing distributional inequalities and regional imbalances.

Module 3: Taxation and Public Debt
Trade off between equity and efficiency in Taxation; Theory of measurement of dead weight losses; The problem of double taxation. Classical view of public debt; Compensatory aspect of debt policy; Burden of public debt; Sources of public debt;

Module 4: Fiscal Policy
Objectives of fiscal policy — full employment, anti-inflation, economic growth, redistribution of income and wealth; Interdependence of fiscal and monetary policies; Budgetary deficits and its implications; Fiscal policy for stabilization — automatic vs. discretionary stabilization; Alternative measures of resource mobilization and their impact on growth, distribution and prices; Balanced budget multiplier.

Module 5: Indian Public Finances
Lack of flexibility in Central and State budgets, shrinking size of development finance through budgets; Trends in public expenditure and public debt; Fiscal crisis and fiscal sector reforms in India; Reports of Finance Commissions in India.

Readings:
1. Goode, R. (1986), Government Finance in Developing Countries, TMH, New Delhi
### ECON 511 – INTERNATIONAL TRADE AND FINANCE

#### Module 1: Foreign Exchange Rate
Foreign Exchange; Foreign Exchange Rate; Foreign Exchange market and exchange rate determination; functions of foreign exchange markets, uses of the foreign exchange Market; Theories of Foreign Exchange rate-the Mint parity theory; the Purchasing power parity Theory; The Balance of payment Theory; Monetary approach to the purchasing parity Theory

#### Module 2: Foreign Exchange market
Introduction; Structure and Functions of foreign Exchange market; Methods of Foreign payments; Concepts of Spot and Forward exchange Rate; Determinants of Exchange Rate under Fixed and Flexible Exchange Rate; Regime and Role of hedging in the determination of exchange rate; Theory of Interest Rate parity

#### Module 3: Open Economy Macro-Economics
Determination of output, interest rates and exchange rates in the long and short runs; Macroeconomic policy in an open economy and international policy coordination: fixed and Flexible exchange rates.

#### Module 4: International Monetary Institutions and Issues
Rise and Fall of Gold Standard; Bretton woods system, International Liquidity; Need, Objectives of IMF, The Subsequent Reforms of IMF; Currency crises, stabilization and other contemporary issues.

#### Module 5: Trade Situations in India
Trade problems and trade policies in India during the last five decades; Recent changes in the Direction and Composition of Trade and their Implications; Rationale and Impact of Trade reforms since 1991 on BOP; Employment and growth; Trade policy and Welfare with special reference to Developing countries; Instruments of Export Promotion and Recent Import and Export policies and Agenda for Future.

#### Readings:
Module 1: Overview of Computer & Dealing with data
Basic operating instructions – Describing the data to RATS and E-views software packages – SPSS – Reading the data – Computing statistics – Displaying the data – Data transformations and creating new series – Graphing the data – Using SRC file in the RATS package - The tools – Where are your data now? Missing data – RATS format – Error messages – Familiarity with different data base such as: PROWESS, Capital online, HBS, National Sample Survey Organization reports, Census data – National Health and Family Welfare reports - Displaying graphs on the screen – Saving and operating graphs – Printing graphs – Labeling graphs – Overlay (two scale) graphs – Multiple graphs on a page.

Module 2: Scalars, Matrices and Functions
Working with scalars – Getting information from RATS – The RATS Data types – Basic Data types – The Aggregate Data types – Matrix calculations.

Module 3: Linear Regression & Hypothesis Testing

Module 4: Non Linear Estimation
General principles and problems – Newton-Raphson and related methods – Setting up your model; Non-linear least squares/Two stage least squares; Example 7.1. Generalized instrumental variables.

Module 5: Introduction to Forecasting

Readings:
Module 1:
Meaning of research- objectives of research - Approach to research- Significance of research -
Types of research- Research in social science - Facts, theories and concepts in social science
research - Research Design - features of a good research design.

Module 2:
Research problem – Identifying the research problem – formulation of research problem,
concept of hypothesis- role and formulation of hypothesis- scientific methods of research-
nature of scientific research- stages of scientific methods.

Module 3:
Logic and Scientific method- deductive and inductive methods- the case study methods-
merits and demerits of case study methods- survey methods- merits and demerits of survey
methods- type of survey- selecting the survey method – sample survey different types – merits
and demerits.

Module 4:
Schedule and questionnaire – principle underlying the construction of questionnaire-
measurement and scaling techniques- processing and analysis of data

Module 5:
Interpretation and report writing- steps- bibliography quality of a good research report.

Readings:
Research, Himalaya Publishing
M.Sc. Economics *(Five year Integrated Programme)*

Semester IX

**ECON 514– INDIAN ECONOMY: ISSUES AND POLICIES – I**

<table>
<thead>
<tr>
<th>Module I: Resource Development in India</th>
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<tbody>
<tr>
<td>Resource profile of India-policies relating to the development of land, forest, water, fisheries and mineral resources of India-Economic development and Environmental degradation-Land degradation and soil erosion-Deforestation – Faulty utilization of water resources-Mining effects-Atmospheric pollution–Measures taken-Global climate change and India-various Global summits and their implications to India</td>
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<tr>
<th>Module II: Profile of Human Resources of India</th>
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<th>Module III: Infrastructure Development in India</th>
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<th>Module IV: Planning Economic Development</th>
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<tbody>
<tr>
<td>Alternative development strategies- goal of self reliance based on import substitution and the post 1991 globalization strategies based on stabilization and structural adjustment packages–Indicative planning–Decentralized planning–District planning-Local planning-Panchayat Experience-73rd and 74th constitutional Amendments-critical Evaluation of Plan performance in India</td>
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<tr>
<th>Module V: Agriculture and Rural Development</th>
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**Readings:**

Module 1: Welfare Economics
John Hicks; Kenneth Arrow; James Buchanan; Amertya K Sen; Leonid Kantorovich; Tjalling Koopmans

Module 2: Open Economy Macroeconomics, Theory of General Equilibrium and Development of National Accounts
Bertin Ohlin; James Meade; Robert Mundell; Paul Krugman; Gerard Debreu; Richard Stone

Module 3: Theory of Money, Economic Fluctuations and Policy
Gunner Myrdal; Friedrich Hayek; Milton Friedman; Lawrence Klein; Robert Lucas; Finn E Kydland; Edward C Prescott; Edmund Phelps

Module 4: Economic Organizations, Game Theory and Decision Making
Herbert Simon; John Harsanyi; John Forbes Nash; Reinhard Selten; Robert Aumann; Thomas Shelling

Module 5: Tools in Economics and Mechanism Design Theory
Ragnar Frisch; John Tinbergen; Paul Samuelson; Wassily Leontief; Trygve Haavelmo; James Heckman; Robert Engle; Clive Granger; Leonid Hurwicz; Eric Maskin; Roger Myerson

Readings:
M.Sc. Economics (Five year Integrated Programme)

Semester X

ECON 521 – INDIAN ECONOMY: ISSUES AND POLICIES - II

Module 1: Industrial Development
Critique of industrial policies-industrial reforms-Sources of Industrial finances- Banks, share market, Insurance companies, Pension funds, Non banking sources and Foreign Direct Investment (FDI) – Role of Foreign Capital for direct investment and portfolio investment-Multinationals – reform of public sector enterprises-privatization and disinvestment debate-globalization and its impact on industrial development- regional disparities in industrial and structural growth -issues facing small scale sector-unorganized sector- Reservation policy relating to small scale Industries- Industrial relations and Labour welfare-National commission on labour- issues in labour market reforms.

Module 2: India’s External Sector
Foreign Trade: Salient features of India’s Foreign trade- composition, direction and Organisation of Trade – New Economic policy and trade: Intellectual Property Rights, Implications of TRIPS, TRIMS, GATS and New EXIM policy- Impact of WTO on various aspects of Indian Economy- Balance of Payments, tariff policy- New Exchange Rate Regime: Partial and full convertibility, Capital Account convertibility, Exchange rate and WTO requirements

Module 3: Indian Public Finance

Module 4: Financial System in India
Money and capital markets- Changing role of RBI -financial sector reforms-monetary policy of RBI and interest rate policies- issues of commercial banks-stock exchange-working of SEBI and capital market reforms- Development finance Institutions, foreign banks and non banking financial institutions-Analysis of price behavior in India-policies of price control

Module 5: Current Indian Economic Issues

Readings:
<table>
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<tr>
<th><strong>ECON 522 - ECONOMICS OF EDUCATION</strong></th>
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**Module 1: Theory of Human Capital Formation**  
Concept of human capital forms of human capital – human capital and economics growth – measures of human capital – limitations of human capital approach

**Module 2: Education and Human Capital Formation**  
Education as an economic good. consumption and investment aspects of education- private and social benefit of education – contribution of education to economic development – the methods of schults and education and human values.

**Module 3: Demand For Education**  

**Module 4: Supply of Educational Facilities**  
Components of educational supply – private and public facilities – pattern of organization and operation of education industry – organization and operation of different limitations of production function analysis.

**Module 5: Financing of Education**  

**Module 6: Education and Manpower Planning**  
Importance of educational and manpower planning in development and less – development countries – the operation of markets for unskilled and skilled labour – approaches to educational and manpower planning cost benefit approach – O.E.C.D. approach – M.R.P. approach – educational planning in E.D.C’s – educational planning in India.

**Module 7: Migration and On-the-Job Training**  
Migration and human capital formation – labour market and migration in India – on-the-job training and skill formation.

**Readings**  
1. Mark Blaug,(2000) Economics of Education  
5. Tilak( 2006), Economics of Inequality in Education  
6. Sudha V.Rao (2003), Education and Rural Development  
Module 1: Expected Utility Theory and Choice under Uncertainty

Module 2: Risk , Asset Pricing Models and term Structure of Interest Rate

Module 3: Models of Securities Prices in Financial Markets

Module 4: Efficiency & Volatility in Financial Markets

Module 5: Option: Features and Price Bounds
Basic taxonomy of option analysis – Payoff structure of an option – Price Bounds for Options (depending on their type, the time left to expiry and their strike price) – put – call parity relationship - Risk Neutral pricing – basic notions of Binomial – Multinomial – Black-Scholes Pricing – What the hedge ratio (‘Delta’) – Gamma – Vega Theta – Rho means.

Readings:
3. E. J. Elton and M.J. Gruber (2005), Morden Portfolio Theory and Investment Analysis, Wiley,
M.Sc. Economics (Five year Integrated Programme)
Semester X

**ECON 525 – CONTRIBUTIONS BY NOBEL LAUREATES II**

**Module 1: Institutional Change, Development and Growth**
Simon Kuznets; Theodore Schultz; Arthur Lewis; Robert Solow; Robert Fogel; Douglass North

**Module 2: Markets with Asymmetric Information; Markets and Efficient Utilization of Resources**
George Akerlof; Michael Spence; Joseph E Stiglitz; James Mirrlees; William Vickrey; Maurice Allais

**Module 3: Financial Markets and Instruments**
James Tobin; Franco Modigliani; Harry Markowitz; Merton Miller; William Forsyth Sharpe; Robert C Merton; Myron Schools

**Module IV: Behavioural Economics**
Daniel Kahneman; Gary Becker; Daniel Mc Fadden; Vernon L Smith

**Module V: Economics of Governance; Common Property Rights and Public Regulations**
Elinor Ostrom; Oliver Williamson; George Stigler; Ronald Coase

**Readings:**