

Rayat Shikshan Sanstha's

**YASHAVANTRAO CHAVAN INSTITUTE OF  
SCIENCE, SATARA**

Lead College of Karmaveer Bhaurao Patil University, Satara

**(An Autonomous College)**

Reaccredited by NAAC with 'A+' Grade

Choice Based Credit System with Multiple Entry and Multiple Exit Option  
(NEP-2020)

Syllabus For

**Bachelor of Science**

**Part - I**

**ECONOMICS**

**Semester I and II**

**(Syllabus to be implemented from Academic Year 2023-24)**

## Structure of the Major Course (Level 4.5)

### Semester- I

Sr.No.	Course Title	Theory			Practical		
		Course Code	No of hours per week	Credits		No of Lectures per week	Credits
1	Economics	BECT-111	4	4	BECP-113	4	2
		BECT-112					

### Semester- II

Sr.No.	Course Title	Theory			Practical		
		Course Code	No of hours per week	Credits		No of Lectures per week	Credits
1	Economics	BECT121	4	4	BECP-123	4	2
		BECT-122					

**B: B.Sc., EC: Economics, T: Theory, P: Practical**

**Course Titles: B.Sc.-I Semester-I**

**Theory: 30 hours (for each course)**

**BECT111: Micro Economics I**

**BECT112: Macro Economics I**

**Practical: 60 hours**

**BECP113: Practical I**

### B.Sc. – I Semester – II

**Theory: 30 hours (for each course)**

**BECT121: Micro Economics II**

**BECT122: Macro Economics II**

**Practical: 60 hours**

**BECP123: Practical II**

## SEMESTER I

### BECT 111: Micro Economics I

**Course Objectives:** Student should be able to...

1. understand the individual decision making.
2. learn theoretical understanding of demand and supply.
3. get the knowledge about the household consumption decisions.
4. study about differentiating the firm from industry.

<b>Credits=2</b>	<b>SEMESTER-I BECT 111: Micro Economics I</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>Introduction to Micro Economics</b>	<b>(08)</b>
	1.1 Meaning and scope of micro economics, Scarcity and choice, problem of scarcity and affluence 1.2 Positive and normative economics and basic tool for economics Analysis 1.3 Basic economic Problems, Choice of technique of production and the problem of economic efficiency 1.4 Nature of economic reasoning Deductive v/s Inductive method, role of assumptions in economic theory	
<b>UNIT II</b>	<b>Demand and Supply</b>	<b>(08)</b>
	2.1 Demand function; Individual and Market demand function, Significance of demand function, shift in demand curve 2.2 Law of Demand; Factors determining demand, relationship between demand function and demand curve. Elasticity of demand 2.3 Supply: Supply function, relation between supply and price 2.4 Law of Supply; Shift in supply curve elasticity of supply, factors determining elasticity of supply, Concept of market equilibrium	
<b>UNIT III</b>	<b>Theory of Consumer Behavior</b>	<b>(08)</b>
	3.1 Utility Analysis: Cardinal v/s Ordinal, Total, Average and Marginal Utility 3.2 Law of Diminishing Marginal utility, Law of Equi-marginal utility, Derivation of Demand Curve 3.3 Consumption Decisions, Consumption, Income and Price 3.4 Consumer Surplus and Measurement.	
<b>UNIT IV</b>	<b>Firm and Industry</b>	<b>(06)</b>
	4.1 Objectives and nature of the firm Types of Business Organization 4.2 Production Function, Total, Average and Marginal Physical Product 4.3 Law of Variable Proportions 4.4 Law of Returns to Scale	

**Course Outcomes:** Student will be able to...

1. explain the fundamental concepts and principles of microeconomics.
2. predict the effects of changes in demand or supply on the equilibrium price and quantity in a market.
3. analyze the effects of changes in income and prices on consumer behavior.
4. evaluate the impact of entry barriers, mergers, and technological change on industry structure and performance.

**Reference Books:**

1. H. L. Ahuja, (2017), Advanced Economic Theory: Micro Economic Analysis, S Chand and Company.
2. Hal R., Varian (2010): Intermediate Microeconomics: A Modern Approach, Springer (India) Pvt. Ltd. India.
3. Robert, Daniell and Prem L. (2009), Microeconomics, Pearson Prentice Hall, Noida.
4. D. N. Dwivedi, (2008) Microeconomic Theory and Applications, Pearson Education.
5. Sen, A. (1999), Microeconomics: Theory and Applications, Oxford University Press, New Delhi.
6. Stigler, G. (1996), Theory of Price, (4th Edition), Prentice Hall of India, New Delhi.
7. Da Costa, G. C. (1980), Production, Prices and Distribution, Tata McGraw Hill, New Delhi.
8. Koutsoyiannis, A. (1979), Modern Microeconomics (2nd Edition), Macmillan Press, London.
9. Archibald, G. C. (Ed.) (1971), Theory of the firm, Penguin, Harmondsworth.
10. Green, H. A. G. (1971), Consumer Theory, Penguin, Harmondsworth.

## **BECT 112: Macro Economics I**

**Course Objectives:** Student should able to...

1. acquire the prior knowledge of macroeconomic variables.
2. study comparative analysis of theoretical development is essential for the proper comprehension of the different issues and policies.
3. learn the systemic facts and studies for empirical analysis.
4. understand the current situation and Government Policies useful to control and manage the economic problems.

<b>Credits=2</b>	<b>SEMESTER-I BECT 112: Macro Economics I</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>National Income and Accounts</b>	<b>(08)</b>
	1.1 Macroeconomic Statics and Dynamics- National Income Accounts: Gross National Product, Gross Domestic Product, National Income at Factor Cost, Personal and disposable income 1.2 National Income at Current and Constant Price, Income Deflator 1.3 Methods of Accounting of National Income 1.4 Use and Significance of National Income Accounting.	
<b>UNIT II</b>	<b>Classical and Cambridge Approaches towards Money</b>	<b>(08)</b>
	2.1 Cash Transaction Approach 2.2 Cash Balance Approach 2.3 Keynes' Reformation of quantity theory of money 2.4 The Saving-Investment Theory of Money	
<b>UNIT III</b>	<b>Supply of Money</b>	<b>(08)</b>
	3.1 Constituents of Supply of Money; Approaches towards Supply of Money 3.2 Credit creation, Determinants of Money Supply 3.3 Monetary Policy: Objectives and limitations, Conflicting Objectives 3.4 Fiscal Policy: Objectives and Limitations.	
<b>UNIT IV</b>	<b>Inflation</b>	<b>(06)</b>
	4.1 Inflation: Meaning and Types 4.2 Causes and Effects of Inflation 4.3 Theories of Inflation: Demand Pull, Cost-Push, Built in Inflation, Measures to Control the Inflation 4.4 Phillips curve: Short run and Long run	

**Course Outcomes:** Student will able to...

- 1) calculate national income using the income approach, expenditure approach, and production approach.
- 2) evaluate the assumptions and implications of the quantity theory in different economic contexts.
- 3) analyze the role of central banks in managing the money supply.
- 4) develop the ability to analyze and assess different theories and policy approaches to managing inflation.

**Reference Books:**

1. Case, K. E. Fair, R. C. & Oster, S.E(2014). Principles of Macroeconomics, 10th Edition, Pearson Education.
2. R. Dornbusch, S. Fischer, R. Startz (2012), Macroeconomics, 11th ed., Tata McGraw Hill.
3. Suraj B. Gupta, Monetary Economics: Institutions, Theory & Policy, S. Chand (2010).
4. Jhingam M. L. (2010). Macro-Economic Theory, Vrinda Publication, New Delhi.
5. Mankiw, N. Gregory (2008). Principles of Macroeconomics, 5 th Edition, Cengage Learning.
6. Nellis, G. Joseph and Parker, D (2004) Principles of Macroeconomics, Financial Times Prentice Hall, Pearson Education.
7. Jagdish Handa (2000), Monetary Economics, Routledge, USA.
8. Mishkin F (1999) Money, Banking and Financial Markets, 3rd edition, Harper Collins Publishers.

## BECP 113: Practical I (Based on BECT 111 and BECT 112)

**Course Objectives:** Student should be able to...

1. study the supply and demand dynamics in different market structures.
2. learn market failures and the role of government in addressing them.
3. understand macroeconomic principles and their applications.
4. gain the knowledge of factors influencing aggregate economic performance and the role of policy in managing the macroeconomy.

Credits=2	<b>SEMESTER-I BECP 113: Practical I</b>	<b>No. of contact hours (60)</b>
	<b>Part A: Practicals Based on BECT 111</b>	
1	Identification and analysis the determinants of demand and supply.	2
2	Calculation of equilibrium price and quantity.	2
3	Understanding the consequences of price ceilings and price floors.	2
4	Calculation of price elasticity of demand and interpret its implications.	2
5	Calculation of income elasticity of demand and classification of goods accordingly.	2
6	Calculation of cross-price elasticity of demand and determining the nature of goods.	2
7	Examination of the characteristics of a perfectly competitive market.	2
8	Explanation of the behavior of monopolies and analysis of profit-maximizing decisions.	2
9	Analysis of the short-run and long-run equilibrium of a monopolistically competitive firm.	2
10	Examination of the behavior of firms in oligopolistic markets.	2
11	Analysis of the causes and consequences of market failures.	2
12	Distinguishing between public goods and private goods, and analyze the free-rider problem.	2
13	Analysis of the impact of asymmetric information in markets.	2
14	Examining the role of government in addressing market failures.	2
15	Analysis of the concept of market power and antitrust regulation.	2
	<b>Part B: Practicals Based on BECT 112</b>	
1	Measurement of National Income.	2
2	Aggregate Demand and Aggregate Supply Analysis.	2
3	Business Cycle Analysis.	2
4	Unemployment and Inflation Analysis.	2
5	Fiscal Policy Analysis.	2
6	Monetary Policy Analysis.	2

7	Exchange Rates and International Trade.	2
8	Economic Growth Analysis.	2
9	Keynesian and Classical Macroeconomic Models.	2
10	Phillips Curve Analysis.	2
11	Aggregate Expenditure and Income Determination.	2
12	Open Economy Macroeconomics.	2
13	Government Debt and Deficit Analysis.	2
14	Economic Policy Evaluation.	2
15	Economic Indicators and Forecasting.	2

**Course Outcomes:** Student will be able to...

1. apply economic principles to analyze and predict changes in equilibrium price and quantity in various market scenarios.
2. evaluate the causes and consequences of market failures, and propose appropriate policy interventions.
3. analyze macroeconomic indicators and their implications for economic performance.
4. evaluate the effectiveness of macroeconomic policies in achieving stable economic growth and managing inflation.

**Reference Books:**

1. H. L. Ahuja, (2017), Advanced Economic Theory: Micro Economic Analysis, S Chand and Company.
2. Case, K. E. Fair, R. C. & Oster, S.E(2014). Principles of Macroeconomics, 10th Edition, Pearson Education.
3. R. Dornbusch, S. Fischer, R. Startz (2012), Macroeconomics, 11th ed., Tata McGraw Hill.
4. Suraj B. Gupta, Monetary Economics: Institutions, Theory & Policy, S. Chand (2010).
5. Jhingam M. L. (2010). Macro-Economic Theory, Vrinda Publication, New Delhi.
6. Hal R., Varian (2010): Intermediate Microeconomics: A Modern Approach, Springer (India) Pvt. Ltd. India.
7. Robert, Daniell and Prem L. (2009), Microeconomics, Pearson Prentice Hall, Noida.
8. D. N. Dwivedi, (2008) Microeconomic Theory and Applications, Pearson Education.
9. Mankiw, N. Gregory (2008). Principles of Macroeconomics, 5 th Edition, Cengage Learning.



10. Nellis, G. Joseph and Parker, D (2004) Principles of Macroeconomics, Financial Times Prentice Hall, Pearson Education.
11. Jagdish Handa (2000), Monetary Economics, Routledge, USA.
12. Mishkin F (1999) Money, Banking and Financial Markets, 3rd edition, Harper Collins Publishers.
13. Sen, A. (1999), Microeconomics: Theory and Applications, Oxford University Press, New Delhi.
14. Stigler, G. (1996), Theory of Price, (4th Edition), Prentice Hall of India, New Delhi.
15. Da Costa, G. C. (1980), Production, Prices and Distribution, Tata McGraw Hill, New Delhi.
16. Koutsoyiannis, A. (1979), Modern Microeconomics (2nd Edition), Macmillan Press, London.
17. Archibald, G. C. (Ed.) (1971), Theory of the firm, Penguin, Harmondsworth.
18. Green, H. A. G. (1971), Consumer Theory, Penguin, Harmondsworth.

## SEMESTER II

### BECT 121 Micro Economics II

**Course Objectives:** Student should be able to...

1. understand different forms of market and price and output determination.
2. study about the consumer theory and consumer behavior.
3. get acquainted with various inputs and its market behavior.
4. learn about the welfare aspect of economics.

<b>Credits=2</b>	<b>SEMESTER-II BECT 121: Micro Economics II</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>Market Structure</b>	<b>(08)</b>
	1.1 Meaning and Classification, Market Structure and Profitability 1.2 Perfect Competition; Features, Short and Long Run Price and Output Determination of Firm and Industry, Efficiency of Perfect Competitive Market 1.3 Monopoly; Price Discrimination, Price and Output Determination, Degree of Monopoly Power 1.4 Monopolistic Competition: Features, Product Differentiation, Short and Long run Price and Output Determination	
<b>UNIT II</b>	<b>Consumer Behavior</b>	<b>(08)</b>
	2.1 Indifference Curve; Meaning and Properties, Superiority of Ordinal over Cardinal Approach 2.2 Marginal Rate of Substitution, Consumer Equilibrium 2.3 Income and Price Consumption Curve, Derivation of Individual Demand Curve from Indifference Curve 2.4 Revealed Preference Theory of Demand	
<b>UNIT III</b>	<b>Factor Pricing</b>	<b>(08)</b>
	3.1 Concept of Factor Productivity; Marginal Revenue Product, Value of Marginal Product 3.2 Wage Determination under Perfect Competition, Factor Pricing under Monopsony 3.3 Marginal Productivity Theory of Distribution; Clark and Marshal-Hicks version 3.4 Relative Share of Labour and Capital, Theory of Rent	
<b>UNIT IV</b>	<b>General Equilibrium and Welfare Economics</b>	<b>(06)</b>
	4.1 Partial and General Equilibrium, General Equilibrium and Economic Efficiency 4.2 Welfare Economics; Value Judgement, Individual and Social Welfare 4.3 Pareto Optimality, Edgeworth Box Diagram and Contract Curve 4.4 Pareto Efficiency and Pareto Competition.	

**Course Outcomes:** Student will be able to...

1. compare the implications of different market structures on competition, consumer welfare, and market outcomes.
2. apply consumer behavior concepts and theories to analyze and explain real-world consumer behavior scenarios.
3. analyze the relationship between factor prices and the marginal productivity of factors.
4. evaluate the trade-offs between efficiency and equity in policy decisions and propose strategies for achieving desirable welfare outcomes.

**Reference Books:**

1. H. L. Ahuja, (2017), Advanced Economic Theory: Micro Economic Analysis, S Chand and Company.
2. Hal R., Varian (2010): Intermediate Microeconomics: A Modern Approach, Springer (India) Pvt. Ltd. India.
3. Robert, Daniell and Prem L. (2009), Microeconomics, Pearson Prentice Hall, Noida.
4. D. N. Dwivedi, (2008) Microeconomic Theory and Applications, Pearson Education.
5. Sen, A. (1999), Microeconomics: Theory and Applications, Oxford University Press, New Delhi.
6. Stigler, G. (1996), Theory of Price, (4th Edition), Prentice Hall of India, New Delhi.
7. Da Costa, G. C. (1980), Production, Prices and Distribution, Tata McGraw Hill, New Delhi.
8. Koutsoyiannis, A. (1979), Modern Microeconomics (2nd Edition), Macmillan Press, London.
9. Archibald, G. C. (Ed.) (1971), Theory of the firm, Penguin, Harmondsworth
10. Green, H. A. G. (1971), Consumer Theory, Penguin, Harmondsworth

## BECT 122 Macro Economics II

**Course Objectives:** Student should be able to...

- 1.study theories and factors influencing economic growth and development.
- 2.learn the role of monetary and fiscal policy in macroeconomic stabilization.
- 3.discuss short-run fluctuations in the economy and the role of policy in managing them.
- 4.gain the knowledge of international trade and macroeconomic variables.

Credits=2	<b>SEMESTER-II BECT 122: Macro Economics II</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>Economic Growth and Development</b>	<b>(06)</b>
	1.1 Classical and neoclassical theories of economic growth 1.2 Factors contributing to long-term economic growth 1.3 Theories of economic development 1.4 Role of institutions and policies in promoting development 1.5 Importance of human capital and technology in economic growth 1.6 Education, innovation, and technological progress 1.7 Causes and consequences of income inequality 1.8 Policies for reducing poverty and promoting inclusive growth	
<b>UNIT II</b>	<b>Monetary and Fiscal Policy</b>	<b>(08)</b>
	2.1 Objectives and tools of monetary policy 2.2 Money supply, interest rates, and inflation targeting 2.3 Objectives and tools of fiscal policy 2.4 Government spending, taxation, and budget deficits 2.5 Interaction and coordination between monetary and fiscal policy 2.6 Policy trade-offs and challenges in macroeconomic stabilization 2.7 Exchange rates, capital flows, and monetary and fiscal policy coordination in an open economy 2.8 Policy challenges in a globalized world	
<b>UNIT III</b>	<b>Macroeconomic Policy in the Short Run</b>	<b>(08)</b>
	3.1 Determinants of aggregate demand and supply 3.2 Short-run equilibrium and output fluctuations 3.3 Phases of the business cycle 3.4 Countercyclical fiscal and monetary policies 3.5 The Phillips curve and the trade-off between inflation and unemployment 3.6 Policy implications for achieving price stability and full employment 3.7 Causes and consequences of economic crises 3.8 Policy interventions and lessons from past crises	

<b>UNIT IV</b>	<b>International Trade and Macroeconomics</b>	<b>(08)</b>
	4.1 Current account, capital account, and balance of payments equilibrium 4.2 Exchange rate determination and its implications 4.3 Trade policies and their impact on economic growth 4.4 Comparative advantage, trade openness, and globalization 4.5 Macroeconomic policy challenges in a globalized world 4.6 Monetary and fiscal policy implications for trade balances 4.7 International organizations and agreements promoting economic cooperation 4.8 Challenges and opportunities of global economic integration	

**Course Outcomes:** Student should be able to...

1. explain the theories and factors influencing economic growth and development.
2. analyze the role and effectiveness of monetary and fiscal policy in macroeconomic stabilization.
3. interpret short-run fluctuations in the economy and evaluate the role of policy in managing them.
5. analyze the relationship between international trade and macroeconomic variables and evaluate policy implications.

**Reference Books:**

1. Romer, D. (2018). Advanced Macroeconomics (5th ed.). McGraw-Hill Education
2. Blanchard, O. (2017). Macroeconomics (7th ed.). Pearson.
3. Mankiw, N. G. (2014). Macroeconomics (8th ed.). Cengage Learning.
4. Acemoglu, D., and Robinson, J. A. (2012). Why nations fail: The origins of power, prosperity, and poverty. Crown Publishing Group.

## BECP 123: Practical II (Based on BECT 121 and BECT 122)

**Course Objectives:** Student should be able to...

1. study microeconomic concepts and tools to real-world scenarios and problems.
2. acquire analytical and problem-solving skills in the field of microeconomics.
3. understand macroeconomic theories and concepts to real-world economic situations.
4. gain analytical and problem-solving skills in the field of macroeconomics.

Credits=2	<b>SEMESTER-II BECP 123: Practical II</b>	<b>No. of contact hours</b>
	<b>Part A: Practicals Based on BECT 121</b>	
1	Understanding of Market Structures	2
2	Consumer Choice and Demand Analysis	2
3	Production and Cost Analysis	2
4	Pricing Strategies and Price Discrimination	2
5	Factor Markets and Income Distribution	2
6	Game Theory and Strategic Behavior	2
7	Externalities and Public Goods	2
8	Market Failures and Government Intervention	2
9	Risk and Uncertainty	2
10	Behavioral Economics	2
11	International Trade and Globalization	2
12	Economic Policy Analysis	2
13	Research and Presentation Skills	2
14	Critical Thinking and Problem Solving	2
15	Ethical and Social Responsibility	2
	<b>Part B: Practicals Based on BECT 122</b>	
1	Macroeconomic Data Analysis	2
2	Fiscal Policy Analysis	2
3	Monetary Policy Analysis	2
4	Exchange Rates and International Trade	2
5	Economic Growth and Development	2
6	Business Cycles and Stabilization Policies	2
7	Inflation and Unemployment	2
8	Open Economy Macroeconomics	2
9	Financial Markets and Macroeconomic Performance	2
10	Economic Policy Evaluation	2
11	Economic Forecasting and Risk Assessment	2

12	Economic Research and Report Writing	2
13	Critical Thinking and Problem Solving	2
14	Policy Advocacy and Ethical Considerations	2
15	Professional Development and Career Readiness	2

**Course Outcomes:** Student will be able to...

1. apply critical thinking skills to analyze complex microeconomic problems.
2. evaluate the ethical dimensions of microeconomic decisions and policies.
3. analyze the role of financial markets in macroeconomic performance and stability.
4. develop creative and effective solutions to macroeconomic challenges.

**Reference Books:**

1. Romer, D. (2018). Advanced Macroeconomics (5th ed.). McGraw-Hill Education
2. Blanchard, O. (2017). Macroeconomics (7th ed.). Pearson.
3. H. L. Ahuja, (2017), Advanced Economic Theory: Micro Economic Analysis, S Chand and Company.
4. Mankiw, N. G. (2014). Macroeconomics (8th ed.). Cengage Learning.
5. Acemoglu, D., and Robinson, J. A. (2012). Why nations fail: The origins of power, prosperity, and poverty. Crown Publishing Group.
6. Robert, Daniell and Prem L. (2009), Microeconomics, Pearson Prentice Hall, Noida.
7. D. N. Dwivedi, (2008) Microeconomic Theory and Applications, Pearson Education.
8. Sen, A. (1999), Microeconomics: Theory and Applications, Oxford University Press, New Delhi.
9. Stigler, G. (1996), Theory of Price, (4th Edition), Prentice Hall of India, New Delhi.
10. Da Costa, G. C. (1980), Production, Prices and Distribution, Tata McGraw Hill, New Delhi.
11. Koutsoyiannis, A. (1979), Modern Microeconomics (2nd Edition), Macmillan Press, London.
12. Archibald, G. C. (Ed.) (1971), Theory of the firm, Penguin, Harmondsworth
13. Green, H. A. G. (1971), Consumer Theory, Penguin, Harmondsworth

## Structure of the Minor Course (Level 4.5)

### Semester- I

Sr.No.	Course Title	Theory			Practical		
		Course Code	No of hours per week	Credits		No of Lectures per week	Credits
1	Economics	BECT-114	4	4	BECP-116	4	2
		BECT-115					

### Semester- II

Sr.No.	Course Title	Theory			Practical		
		Course Code	No of hours per week	Credits		No of Lectures per week	Credits
1	Economics	BECT124	4	4	BECP-126	4	2
		BECT-125					

**B: B.Sc., EC: Economics, T: Theory, P: Practical**

**Course Titles: B.Sc.-I Semester-I**

**Theory: 30 hours (for each course)**

**BECT114: Mathematics for Economics**

**BECT115: Statistics for Economics**

**Practical: 60 hours**

**BECP116: Practical I**

### B.Sc. – I Semester – II

**Theory: 30 hours (for each course)**

**BECT124: Econometrics I**

**BECT125: Computer Applications in Economics I**

**Practical: 60 hours**

**BECP126: Practical II**



## SEMESTER I

### BECT 114: Mathematics for Economics

**Course Objectives:** Student should be able to...

1. understand basic concepts of Mathematics.
2. learn to do matrix operations.
3. get the knowledge about the process of differentiation.
4. study about the process of integration.

<b>Credits=2</b>	<b>SEMESTER-I BECT 114: Mathematics for Economics</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>Sets, Functions and Straight Line</b>	<b>(08)</b>
	1.1 Sets-Basic set operations, convex sets 1.2 Functions-Meaning, elementary types of functions: quadratic, polynomial, power, exponential, logarithmic 1.3 Convex, concave, quasi concave, homogeneous and homothetic functions 1.4 Straight line and its equation	
<b>UNIT II</b>	<b>Matrix Algebra</b>	<b>(08)</b>
	2.1 Matrix-Concept, Meaning and Types 2.2 Operations of Matrices-Addition, Subtraction and Multiplication, Determinant of Matrices, Rank of Matrix 2.3 Inverse of Matrix 2.4 Solution of Simultaneous Equations using Matrix	
<b>UNIT III</b>	<b>Differential Calculus</b>	<b>(08)</b>
	3.1 Differentiation-Meaning and concept 3.2 Differential Calculus of One Variable-Rules of differentiation 3.3 Differential Calculus of Two Variables-Partial Differentiation and Total Differentiation 3.4 Maxima and Minima	
<b>UNIT IV</b>	<b>Integral Calculus</b>	<b>(06)</b>
	4.1 Integration-Concept, Meaning 4.2 Rules of Integration 4.3 Indefinite Integration 4.4 Definite integration	

**Course Outcomes:** Student will be able to...

1. use straight line equations to solve practical problems, such as finding the equation of a line passing through two points.
2. analyze matrices to determine their properties, such as symmetry, skew-symmetry, or orthogonality.
3. evaluate the correctness of derivative calculations or solutions to optimization and related rates problems.
4. design and execute strategies to solve complex problems involving areas, volumes, or accumulated quantities using integration.

**Reference Books:**

1. K. Sydsaeter, P. Hammond et.al., Essential Mathematics for Economic Analysis, 6<sup>th</sup> edition, Pearson Educational Asia, Delhi, 2021.
2. E. T. Dowling: Introduction to Mathematical Economics, 1<sup>st</sup> edition, McGraw Hill, 2020.
3. C. P. Simon and L. Blume, Mathematics for Economists, Viva Books, 2018.
4. D. Bose, An Introduction to Mathematical Economics, Himalaya Publishing House, 2018.
5. A. Chiang and K. Wainwright, Fundamental Methods of Mathematical Economics, 4<sup>th</sup> edition, McGraw Hill, 2017.
6. Rudin W., Principles of Mathematical Analysis, 3<sup>rd</sup> edition, McGraw-Hill, 2017.
7. Mehta and Madnani, Mathematics for Economists, Sultan Chand & Sons, 2013.
8. E. Silberberg and W. Suen, The Structure of Economics, 3<sup>rd</sup> edition, McGraw Hill, 2000.

## **BECT 115: Statistics for Economics**

**Course Objectives:** Student should be able to...

1. acquire the prior knowledge of macroeconomic variables.
2. study comparative analysis of theoretical development is essential for the proper comprehension of the different issues and policies.
3. learn the systemic facts and studies for empirical analysis.
4. understand the current situation and Government Policies useful to control and manage the economic problems.

<b>Credits=2</b>	<b>SEMESTER-I</b> <b>BECT 115: Statistics for Economics</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>Statistics-Conceptual Framework</b>	<b>(08)</b>
	1.1 Statistics- Origin, Meaning, and Growth 1.2 Statistical Data Methods and applications 1.3 Functions and Importance of Statistics 1.4 Limitations of Statistics, Methods and Experimentation, Statistics and Computer	
<b>UNIT II</b>	<b>Sampling and Data Processing</b>	<b>(08)</b>
	2.1 Types of Data-Primary and Secondary, Methods of Collecting Primary Data, Sources of Secondary Data 2.2 Census and Sampling Methods, Methods of Sampling-Non-probability and Probability, Determination of sample size 2.3 Classification of data-Types of Classification, Formation of Frequency Distribution 2.4 Diagrammatic and Graphic Presentation- Types of Diagram and Graphs.	
<b>UNIT III</b>	<b>Measures of Central Tendency</b>	<b>(08)</b>
	3.1 Meaning, Objectives of averaging, Characters of a good Average 3.2 Mean and Weighted mean: features and formulae 3.3 Median and Mode: features and formulae 3.4 Geometric Mean, Harmonic Mean: features and formulae	
<b>UNIT IV</b>	<b>Measures of Dispersion</b>	<b>(06)</b>
	4.1 Meaning and significance 4.2 Objectives of Measuring Dispersion, Properties of a Good Measure of Dispersion 4.3 Methods of Studying Dispersion-Range, Inter-quartile range, Quartile Deviation 4.4 Methods of Studying Dispersion-Mean Deviation, Standard Deviation	

**Course Outcomes:** Student will be able to...

- 1) apply appropriate descriptive statistics techniques to summarize and interpret data sets.
- 2) analyze the implications and potential sources of bias in different sampling methods.
- 3) assess the strengths and weaknesses of measures of central tendency in terms of their representation of the dataset.
- 4) design and conduct experiments or surveys that require the calculation and interpretation of measures of dispersion.

**Reference Books:**

1. H. A. Taha, Operations Research, 10<sup>th</sup> edition, Pearson Education, 2019.
2. Elhance and Aggarwal, Fundamentals of Statistics, Kitab Mahal, Allahabad, 2018.
3. A. C. Chiang and K. Wainwright, Fundamental Methods of Mathematical Economics, 4<sup>th</sup> edition, McGraw Hill, New York, 2017.
4. Allen, R. G. D., Mathematical Analysis for Economists, Trinity Press, 2014.
5. Gupta, S. C. and Kapoor V. K., Fundamentals of Applied Statistics, 4<sup>th</sup> edition, S. Chand and Sons., New Delhi, 2014.
6. A. M. Gun, M. K. Gupta and B. Dasgupta, Fundamentals of Statistics, Vol. 1, The World Press Ltd., Calcutta, 2013.
7. Gupta, S.P., Statistical Methods, Sultan Chand and Sons, New Delhi, 2012.
8. W. J. Baumol, Economic Theory and Operations Analysis, 4<sup>th</sup> edition, Prentice Hall, Englewood Cliffs, New Jersey, 1979.
9. F. E. Croxton, Applied General Statistics, Pitman Publishing, 1968.

## BECP 116: Practical I (Based on BECT 114 and BECT 115)

**Course Objectives:** Student should be able to...

1. study to analyze and manipulate data to derive meaningful insights and draw conclusions.
2. learn how to translate economic scenarios into mathematical models and use these models to make informed decisions.
3. understand how to summarize and describe economic data accurately.
4. study application of probability theory to model uncertainty in economic situations.

Credits=2	<b>SEMESTER-I BECP 116: Practical I (Based on BECT 114 and BECT 115)</b>	No. of contact hours
	<b>Part A: Practicals based on BECT 114</b>	
1	Examples on set theory.	2
2	Examples on relation on sets.	2
3	Examples on type of functions.	2
4	Examples on Straight lines.	2
5	Examples on Operations on Matrices.	2
6	Examples on Rank and Determinant of Matrix.	2
7	Examples on Inverse of Matrix.	2
8	Solution of Simultaneous Equations using Matrix.	2
9	Examples on Differentiation of functions of one variable.	2
10	Examples on Partial Differentiation.	2
11	Examples on Total differentiation.	2
12	Examples on Maxima.	2
13	Examples on Minima.	2
14	Examples on Indefinite integral.	2
15	Examples on definite integral.	2
	<b>Part A: Practicals based on BECT 115</b>	
1	Problems on collection of primary and secondary data	2
2	Problems on Census and Sampling method	2
3	Problems on Classification of data	2
4	Problems on graphical representation of data	2
5	Problems on Mean	2
6	Problems on Weighted Mean	2
7	Problems on Median	2

8	Problems on Mode	2
9	Problems on Geometric Mean	2
10	Problems on Harmonic Mean	2
11	Problems on Dispersion range	2
12	Problems on Inter-quartile range	2
13	Problems on Quartile deviation	2
14	Problems on Mean Deviation	2
15	Problems on Standard Deviation	2

**Course Outcomes:** Student will be able to...

1. use mathematical techniques to analyze economic data.
2. apply mathematical concepts and techniques to formulate and solve economic models that represent real-world scenarios.
3. formulate data collection, organization, and manipulation techniques to economic datasets, preparing them for statistical analysis.
4. construct solutions of measures of central tendency, dispersion, and correlation to summarize and describe economic data accurately.

**Reference Books:**

- 1) K. Sydsaeter, P. Hammond et.al., Essential Mathematics for Economic Analysis, 6<sup>th</sup> edition, Pearson Educational Asia, Delhi, 2021.
- 2) E. T. Dowling: Introduction to Mathematical Economics, 1<sup>st</sup> edition, McGraw Hill, 2020.
- 3) H. A. Taha, Operations Research, 10<sup>th</sup> edition, Pearson Education, 2019.
- 4) Elhance and Aggarwal, Fundamentals of Statistics, Kitab Mahal, Allahabad, 2018.
- 5) A. Chiang and K. Wainwright, Fundamental Methods of Mathematical Economics, 4<sup>th</sup> edition, McGraw Hill, 2017.
- 6) Rudin W., Principles of Mathematical Analysis, 3<sup>rd</sup> edition, McGraw-Hill, 2017.
- 7) A. C. Chiang and K. Wainwright, Fundamental Methods of Mathematical Economics, 4<sup>th</sup> edition, McGraw Hill, New York, 2017.
- 8) Allen, R. G. D., Mathematical Analysis for Economists, Trinity Press, 2014.
- 9) Gupta, S. C. and Kapoor V. K., Fundamentals of Applied Statistics, 4<sup>th</sup> edition, S. Chand and Sons., New Delhi, 2014.
- 10) A. M. Gun, M. K. Gupta and B. Dasgupta, Fundamentals of Statistics, Vol. 1, The World Press Ltd., Calcutta, 2013.
- 11) Mehta and Madnani, Mathematics for Economists, Sultan Chand & Sons, 2013.
- 12) Gupta, S.P., Statistical Methods, Sultan Chand and Sons, New Delhi, 2012.

- 13) E. Silberberg and W. Suen, *The Structure of Economics*, 3<sup>rd</sup> edition, McGraw Hill, 2000.
- 14) W. J. Baumol, *Economic Theory and Operations Analysis*, 4<sup>th</sup> edition, Prentice Hall, Englewood Cliffs, New Jersey, 1979.
- 15) F. E. Croxton, *Applied General Statistics*, Pitman Publishing, 1968.

## SEMESTER II

### BECT 124 Econometrics I

**Course Objectives:** Student should be able to...

1. understand different forms of Econometric Model.
2. study about the estimation of different Econometric Models.
3. get acquainted with interpretation of the Econometric Model.
4. learn about Comparison of different Econometric Models.

Credits=2	SEMESTER-II BECT 124: Econometrics I	No. of hours per unit
<b>UNIT I</b>	<b>Introduction to Econometrics</b>	<b>(08)</b>
	1.1 Definition, Nature and Scope of Econometrics 1.2 Methodology of Econometrics 1.3 Types of Econometrics 1.4 Role of Computers	
<b>UNIT II</b>	<b>Single Equation Regressions</b>	<b>(08)</b>
	2.1 Nature of Regression Analysis 2.2 Basics of Two Variable Regression Analysis 2.3 Estimating Two Variable Regression Model 2.4 Problems in estimation	
<b>UNIT III</b>	<b>Hypothesis Testing &amp; Interval Estimation</b>	<b>(08)</b>
	3.1 One-Tail & Two-tail Tests 3.2 t, F and Chi-square Test 3.3 Confidence Intervals for Regression Coefficients 3.4 Interpretation of Confidence Intervals	
<b>UNIT IV</b>	<b>Extensions of Two Variable Regression</b>	<b>(06)</b>
	4.1 Regression Through Origin 4.2 Regression on Standardized Variables 4.3 Functional Forms of Regression Models 4.4 Choice of Functional Form	

**Course Outcomes:** Student will be able to...

1. describe the difference between causation and correlation in econometric analysis.
2. apply the least squares method to estimate the coefficients of a simple linear regression equation.
3. analyze the results of a hypothesis test by interpreting p-values and making decisions based on them.
4. assess the overall goodness of fit of a multiple regression model using R-squared and adjusted R-squared.



**Reference Books:**

1. B. H. Baltagi, *Econometrics*, 6<sup>th</sup> edition, Springer, New York, 2021.
2. D. Gujarati, *Basic Econometrics*, 5<sup>th</sup> edition, McGraw Hill, New York, 2017.
3. G. S. Maddala and K. Lahiri, *Introduction to Econometrics*, 4<sup>th</sup> edition, John Williams and Sons, New York, 2012.
4. C. Dougherty, *Introduction to Econometrics*, 4<sup>th</sup> edition, Oxford University press, New York, 2011.
5. P. Kennedy, *A Guide to Econometrics*, 6<sup>th</sup> edition, Wiley Blackwell, New York, 2008.
6. A. S. Goldberger, *Introductory Econometrics*, Harvard University Press, Cambridge, Mass, 1998.
7. J. Kmenta, *Elements of Econometrics*, 2<sup>nd</sup> edition, The University of Michigan Press, New York, 1997.
8. T. Amemiya, *Advanced Econometrics*, 1<sup>st</sup> edition, Harvard University Press, Cambridge, Mass, 1985.

## BMT 125 Computer Applications in Economics

**Course Objectives:** Student should be able to

1. acquire the basic knowledge of Computer and its parts.
2. study the Computer Tools and the facilities available
3. discuss basics of Internet since it has become the significant part of life.
4. handle real data with confidence by applying econometric methods of analysis to new circumstances

Credits=2	<b>SEMESTER-II</b> <b>BMT 125: Computer Applications in Economics</b>	<b>No. of hours per unit</b>
<b>UNIT I</b>	<b>Basics of Computer and Text Processing</b>	<b>(06)</b>
	<p>1.1 Computer Systems: characteristics of a computer, components of a computer system –CPU, memory, storage devices and I/O devices</p> <p>1.2 Note Pad and Word Pad: Basic Usage - Create and save a document. Edit and format.</p> <p>1.3 Word processor: Create and save a document. Edit and format text: text style (B.I.U.), font type, font size, text colour, alignment of text. Format paragraphs with line and/or paragraph spacing. Add headers and footers, numbering pages, grammar and spell check utilities, subscript and superscript, insert symbols, use print preview, and print a document</p> <p>1.4 Insert pictures, change the page setting, add bullets and numbering, borders and shading, and insert tables – insert/delete rows and columns, merge and split cells. Use auto-format, track changes, use of drawing tools, shapes and mathematical symbols.</p>	
<b>UNIT II</b>	<b>Office tools: Text Processing and Spread sheet Software</b>	<b>(10)</b>
	<p>2.1 Presentation tool: understand the concept of slide shows, basic elements of a slide, different types of slide layouts create and save a presentation, and learn about the different views of a slide set – normal view, slide sorter view and hand-outs.</p> <p>2.2 Edit and format a slide: add titles, subtitles, text, background, and watermark, headers and footers, and slide numbers. Insert pictures from files, create animations, add sound effects, and rehearse timings</p> <p>2.3 Spread sheets: concept of a worksheet and a workbook, create and save a worksheet. Working with a spread sheet: enter numbers, text, date/time, series using auto fill</p> <p>2.4 Edit and format a worksheet including changing the colour, size, font, alignment of text; insert and delete cells, rows and columns. Enter a formula using the operators (+,-,*, /), refer to cells, and print a worksheet. Use simple statistical functions: SUM(), AVERAGE(), MAX (), MIN (), IF () (without compound statements)</p>	
<b>UNIT III</b>	<b>Internet Basics</b>	<b>(06)</b>
	<p>3.1 Definition, History and Evolution of the Internet Computer Network</p> <p>3.2 WWW, web server, client, website, browser</p>	

	3.3 ISP, Ways to Connect to Internet 3.4 How to host a website on internet	
<b>UNIT IV</b>	<b>Computer Application in Descriptive Statistics</b>	<b>(08)</b>
	4.1 Central Tendency: Meaning, concept and objectives 4.2 Measures of Central Tendency: Arithmetic Mean, Median, Mode, Geometric Mean and Harmonic Mean 4.3 Measures of Dispersion: Range, Quartile Deviation, Mean Deviation 4.4 Standard Deviation and Coefficient of Variation	

**Course Outcomes:** Student will be able to...

1. describe the process of text processing, including editing, formatting, and manipulating text documents.
2. apply basic mathematical functions and formulas to perform calculations in spreadsheets.
3. analyze search results to determine the relevance and credibility of web sources.
4. evaluate the appropriateness of different descriptive statistics for different types of data.

**Reference Books:**

1. Elhance and Aggarwal, Fundamentals of Statistics, Kitab Mahal, Allahabad, 2018.
2. V. Rajaram and N. Adabala, Fundamentals of Computers, 6<sup>th</sup> edition, Prentice Hall of India, New Delhi, 2014.
3. K. Dhanasekaran, Computer applications in Economics, Vrinda Publications Pvt. Ltd., 2013.
4. S. C. Gupta, Fundamentals of Statistics, 7<sup>th</sup> edition, Himalaya Publishing House, Bombay, 2011.
5. P. K. Sinha, Computer Fundamentals, 6<sup>th</sup> edition, BPB Publications, New Delhi, 2004.
6. D. H. Sanders, Computer Today, 3<sup>rd</sup> edition, McGraw Hill, New York, 1988.
7. N. M. Downie and R. W. Heath, Basic Statistical Methods, Harper and Row, New York, 1970.
8. T. Yamane, Statistics: An Introductory Analysis, Harper and Row (India) and John Weather hill Inc., Tokyo, 1967.

## BECP 126: Practical II (Based on BECT124 and BECT 125)

**Course Objectives:** Student should be able to...

1. gain proficiency in data visualization techniques to effectively represent economic trends and patterns.
2. learn the significance of econometric analysis in economics and related fields.
3. understand utilization of software's to create graphical representations of economic trends, facilitating clearer communication of findings.
4. study computer applications to address specific economic questions and challenges.

Credits=2	<b>SEMESTER-I</b>	No. of contact hours
	<b>BECP 126: Practical II (Based on BECT 124 and BECT 125)</b>	
	<b>Part A: Practicals based on BECT 124</b>	
1	Introduction to R/Python for Econometrics	2
2	Descriptive Statistics and Data Visualization	2
3	Simple Linear Regression	2
4	Hypothesis Testing in Regression	2
5	Model Assumptions and Diagnostics	2
6	Multiple Linear Regression	2
7	Dummy Variables and Categorical Variables	2
8	Multicollinearity and Variable Selection	2
9	Heteroscedasticity and Robust Regression	2
10	Model Comparison and Goodness of Fit	2
11	Instrumental Variables (IV) Regression	2
12	Time Series Analysis: Autocorrelation	2
13	Time Series Analysis: Stationarity	2
14	Panel Data Analysis: Fixed Effects and Random Effects	2
15	Basic Nonparametric Methods	2
	<b>Part A: Practicals based on BECT 125</b>	
1	Data Exploration with Spreadsheets	2
2	Creating and Interpreting Supply-Demand Graphs	2
3	Regression Analysis with Excel	2
4	Consumer Price Index Calculation	2
5	Visualizing International Trade Patterns	2
6	Stock Market Analysis with Python	2

7	Economic Growth and GDP	2
8	Labor Market Analysis with R	2
9	Econometric Modeling	2
10	Environmental Economics Simulation	2
11	Economic Impact of Taxes	2
12	Game Theory Simulation	2
13	Forecasting and Time Series Analysis	2
14	Data Visualization for Economic Inequality	2
15	Monte Carlo Simulation for Economic Uncertainty	2

**Course Outcomes:** Student will be able to...

1. explain the purpose of econometrics and its applications in empirical economic analysis.
2. apply statistical software to estimate regression coefficients and interpret their economic meaning.
3. analyze economic data using software tools to identify patterns, trends, and relationships between variables.
4. assess the quality and reliability of data sources for economic analysis.

**Reference Books:**

1. B. H. Baltagi, Econometrics, 6<sup>th</sup> edition, Springer, New York, 2021.
2. Elhance and Aggarwal, Fundamentals of Statistics, Kitab Mahal, Allahabad, 2018.
3. D. Gujarati, Basic Econometrics, 5<sup>th</sup> edition, McGraw Hill, New York, 2017.
4. V. Rajaram and N. Adabala, Fundamentals of Computers, 6<sup>th</sup> edition, Prentice Hall of India, New Delhi, 2014.
5. K. Dhanasekaran, Computer applications in Economics, Vrinda Publications Pvt. Ltd., 2013.
6. G. S. Maddala and K. Lahiri, Introduction to Econometrics, 4<sup>th</sup> edition, John Williams and Sons, New York, 2012.
7. C. Dougherty, Introduction to Econometrics, 4<sup>th</sup> edition, Oxford University press, New York, 2011.
8. P. Kennedy, A Guide to Econometrics, 6<sup>th</sup> edition, Wiley Blackwell, New York, 2008.
9. P. K. Sinha, Computer Fundamentals, 6<sup>th</sup> edition, BPB Publications, New Delhi, 2004.
10. A. S. Goldberger, Introductory Econometrics, Harvard University Press, Cambridge, Mass, 1998.

- 11.J. Kmenta, Elements of Econometrics, 2<sup>nd</sup> edition, The University of Michigan Press, New York, 1997.
- 12.D. H. Sanders, Computer Today, 3<sup>rd</sup> edition, McGraw Hill, New York,1988.
- 13.T. Amemiya, Advanced Econometrics,1<sup>st</sup> edition, Harvard University Press, Cambridge, Mass, 1985.
- 14.N. M. Downie and R. W. Heath, Basic Statistical Methods, Harper and Row, New York, 1970.
- 15.T. Yamane, Statistics: An Introductory Analysis, Harper and Row (India) and John Weather hill Inc., Tokyo, 1967.

Rayat Shikshan Sanstha's  
Yashavantrao Chavan Institute of Science, Satara (Autonomous)  
**Department of Economics with Mathematics**

**Open Elective (OE) Course Name: Digital Economics**

**Semester – I**

**BECT 117: E Banking**

**Course Objectives:** Students should be able to...

1. understand the concepts, principles and technologies underlying e-banking.
2. explore the advantages, challenges, and implications of e-banking in the financial industry.
3. gain the knowledge of skills in evaluating the effectiveness and security of e-banking systems.
4. learn emerging trends and innovations in e-banking.

Credits (Total Credits 2)	SEMESTER – I BMT117: E Banking	No. of hours per unit
<b>Unit – I</b>	<b>Introduction to E-Banking</b>	<b>(08)</b>
	1.1 Overview of e-banking and its significance 1.2 Evolution of traditional banking to e-banking 1.3 Advantages and challenges of e-banking 1.4 Regulatory framework and legal considerations	
<b>Unit – II</b>	<b>E-Banking Services</b>	<b>(08)</b>
	2.1 Online banking and its features 2.2 Mobile banking and its applications 2.3 Electronic funds transfers and payment systems 2.4 E-banking for businesses and corporate customers	
<b>Unit – III</b>	<b>E-Banking Security</b>	<b>(08)</b>
	3.1 Security threats and vulnerabilities in e-banking 3.2 Authentication and access control mechanisms 3.3 Encryption and data protection techniques 3.4 Fraud detection and prevention in e-banking	
<b>Unit – IV</b>	<b>E-Banking Innovations and Future Trends</b>	<b>(06)</b>
	4.1 Blockchain technology and its impact on e-banking 4.2 Artificial intelligence and machine learning in e-banking 4.3 Biometric authentication and identity verification 4.4 Emerging trends and challenges in e-banking	

**Course Outcomes:** Students will be able to...

1. demonstrate a comprehensive understanding of e-banking concepts, theories, and models.
2. evaluate and select appropriate technologies and platforms for e-banking implementation.
3. apply security measures to protect e-banking transactions and customer information.
4. Interpret and comply with regulatory requirements and legal frameworks governing e-banking

**Reference Books:**

- 1) Chen, R. (2020). Security issues and challenges in e-banking. *Journal of Cybersecurity Research*, 5(2), 76-90.
- 2) Joseph, R. (2019). *E-Banking and Emerging Multidisciplinary Processes: Social, Economical, and Organizational Models*. Hershey, PA: IGI Global.
- 3) Johnson, M., & Smith, A. (2019). E-banking regulation: A comparative analysis of international frameworks. *Journal of Banking Law*, 36(4), 345-362.
- 4) Ravi, S., & Saxena, A. (2018). *E-Banking Management: Issues, Solutions, and Strategies*. New Delhi, India: Springer.



## **BECT118: Digital Currency**

**Course Objectives:** Students should be able to...

1. understand the basic concepts and principles of digital currencies.
2. explore the underlying technology of blockchain and its relevance to digital currencies.
3. gain knowledge of various types of cryptocurrencies and their economic and social implications.
4. study the challenges and opportunities associated with the adoption and regulation of digital currencies.

<b>Credits (Total Credits 2)</b>	<b>SEMESTER – I  BECT118: Digital Currency</b>	<b>No. of hours per unit</b>
<b>Unit – I</b>	<b>Introduction to Digital Currencies</b>	<b>(08)</b>
	1.1 Definition and characteristics of digital currencies 1.2 History and evolution of digital currencies 1.3 Advantages and disadvantages of digital currencies 1.4 Current trends and developments in the digital currency landscape.	
<b>Unit – II</b>	<b>Blockchain Technology and Digital Currencies</b>	<b>(08)</b>
	2.1 Overview of blockchain technology 2.2 Decentralization and consensus mechanisms 2.3 Security and privacy considerations in blockchain networks 2.4 Use cases of blockchain in digital currencies.	
<b>Unit – III</b>	<b>Types of Cryptocurrencies</b>	<b>(08)</b>
	3.1 Introduction to cryptocurrencies 3.2 Bitcoin and other major cryptocurrencies 3.3 Altcoins and tokenization 3.4 Stablecoins and their role in the digital currency ecosystem.	
<b>Unit – IV</b>	<b>Adoption and Regulation of Digital Currencies</b>	<b>(06)</b>
	4.1 Challenges and barriers to the adoption of digital currencies 4.2 Regulatory frameworks and policy considerations 4.3 Central bank digital currencies (CBDCs) 4.4 Future prospects and implications of digital currencies	

**Course Outcomes:** Students will be able to...

1. define and explain the fundamental concepts and principles of digital currencies.
2. understand the technology behind blockchain and its role in digital currencies.
3. evaluate different types of cryptocurrencies and their potential impact on the economy and society.
4. analyze the challenges and opportunities in the adoption and regulation of digital currencies.

## Reference Books:

- 1) Casey, M. J., and Vigna, P. (2018), *The Truth Machine: The Blockchain and the Future of Everything*, St. Martin's Press.
- 2) Antonopoulos, A. M. (2017), *Mastering Bitcoin: Unlocking Digital Cryptocurrencies*, O'Reilly Media.
- 3) Tapscott, D., and Tapscott, A. (2016), *Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World*. Penguin.
- 4) Popper, N. (2016), *Digital Gold: Bitcoin and the Inside Story of the Misfits and Millionaires Trying to Reinvent Money*, HarperCollins.
- 5) Vigna, P., and Casey, M. J. (2016), *The Age of Cryptocurrency: How Bitcoin and Digital Money are Challenging the Global Economic Order*, Picador.
- 6) Swan, M. (2015), *Blockchain: Blueprint for a New Economy*, O'Reilly Media.
- 7) Buterin, V. (2014), *Ethereum White Paper*, Retrieved from <https://ethereum.org/en/whitepaper/>
- 8) Nakamoto, S. (2008), *Bitcoin: A Peer-to-Peer Electronic Cash System*, Retrieved from <https://bitcoin.org/bitcoin.pdf>

### BCEP119: Lab I (Based on BECT 117 and BECT 118)

**Course Objectives:** Students should be able to...

1. learn the concepts and principles of electronic banking.
2. understand practical skills in utilizing e-banking tools and platforms for efficient financial transactions.
3. gain practical knowledge and skills related to digital currency transactions and operations.
4. study the practical applications and implications of digital currencies in various scenarios.

Credits (Total Credits 2)	SEMESTER – I BCEP119: Lab I (Based on BECT 117 and BECT 118) List of Practical (30)	No. of hours per Practical
	<b>Part A (Based on BECT 117)</b>	
1	Creating an e-banking account with a reputable financial institution	2
2	Transferring funds in self-accounts within the e-banking platform	2
3	Performing an interbank fund transfer using the e-banking platform	2
4	Setting up bill payments for utilities, credit cards, or other regular payments	2
5	Performing basic banking activities using the mobile banking app	2
6	depositing a check using e-banking	2
7	Accessing account statements and transaction history online	2
8	Exploring the security features and measures of e-banking platforms	2
9	Navigation through the loan application process on the e-banking platform	2
10	Setting up recurring automatic payments for regular bills	2
11	Exploring investment options available through e-banking	2
12	Utilizing financial planning tools offered by e-banking platforms	2
13	Understanding the customer support services available for e-banking	2
14	Presenting a case study or report on a notable e-banking innovation	2
15	Participating in a simulated e-banking security breach scenario	2
	<b>Part B (Based on BECT 118)</b>	
1	Creating and setting up a digital wallet for storing and managing digital currencies	2
2	Executing a buy or sell order for a selected digital currency	2
3	Analysing the price movements and trends of a digital currency using charting tools	2
4	Conducting a peer-to-peer transaction using a digital currency	2

5	Understanding the process of purchasing tokens and managing the acquired tokens	2
6	Executing predefined functions or transactions within the smart contract	2
7	Exploring and utilizing a decentralized finance platform for lending or borrowing digital currencies	2
8	Implementing additional security measures for protecting digital assets, such as two-factor authentication or hardware wallets	2
9	Creating and managing a diversified cryptocurrency portfolio	2
10	Integrating a digital currency payment gateway into an e-commerce website	2
11	Simulating a cross-border remittance transaction using a digital currency	2
12	Performing an anonymous transaction using a privacy coin	2
13	Utilizing a blockchain explorer tool to track and verify digital currency transactions	2
14	Calculating and reporting digital currency holdings and gains for taxation purposes	2
15	Choosing a specific digital currency or use case and conduct an in-depth analysis	2

**Course Outcomes:** Students will be able to...

1. understand the fundamental concepts and functions of e-banking.
2. apply e-banking tools and platforms effectively for various financial transactions.
3. demonstrate proficiency in conducting digital currency transactions securely and efficiently.
4. analyze and evaluate the practical use cases and challenges associated with digital currencies in different contexts.

**Reference Books:**

- 1) Chen, R. (2020). Security issues and challenges in e-banking. *Journal of Cybersecurity Research*, 5(2), 76-90.
- 2) Joseph, R. (2019). *E-Banking and Emerging Multidisciplinary Processes: Social, Economical, and Organizational Models*. Hershey, PA: IGI Global.
- 3) Johnson, M., & Smith, A. (2019). E-banking regulation: A comparative analysis of international frameworks. *Journal of Banking Law*, 36(4), 345-362.
- 4) Ravi, S., & Saxena, A. (2018). *E-Banking Management: Issues, Solutions, and Strategies*. New Delhi, India: Springer.
- 5) Casey, M. J., and Vigna, P. (2018), *The Truth Machine: The Blockchain and the Future of Everything*, St. Martin's Press.
- 6) Antonopoulos, A. M. (2017), *Mastering Bitcoin: Unlocking Digital Cryptocurrencies*, O'Reilly Media.
- 7) Tapscott, D., and Tapscott, A. (2016), *Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World*. Penguin.
- 8) Popper, N. (2016), *Digital Gold: Bitcoin and the Inside Story of the Misfits and Millionaires Trying to Reinvent Money*, HarperCollins.
- 9) Vigna, P., and Casey, M. J. (2016), *The Age of Cryptocurrency: How Bitcoin and Digital Money are Challenging the Global Economic Order*, Picador.

- 10) Swan, M. (2015), Blockchain: Blueprint for a New Economy, O'Reilly Media.
- 11) Buterin, V. (2014), Ethereum White Paper, Retrieved from <https://ethereum.org/en/whitepaper/>
- 12) Nakamoto, S. (2008), Bitcoin: A Peer-to-Peer Electronic Cash System, Retrieved from <https://bitcoin.org/bitcoin.pdf>

## Semester – II

### BECT127: Share Market

**Course Objectives:** Students should be able to...

1. gain the basic concepts and terminologies related to share markets.
2. learn depreciation and depletion and their relation to the decrease in value of tangible assets.
3. understand break even analysis and its significance in business decision making.
4. study different types of leverage and understand how they affect risk and return.

<b>Credits (Total Credits 2)</b>	<b>SEMESTER – II BECT127: Share Market</b>	<b>No. of hours per unit/credits</b>
<b>Unit – I</b>	<b>Capital Budgeting</b>	<b>(08)</b>
	Net Present Value, Internal rate of return, Profitability index, Capitalization and Capitalized cost, other capital budgeting methods.	
<b>Unit – II</b>	<b>Depreciation and Depletion</b>	<b>(08)</b>
	The Straight-line method, The fixed proportion method, The sum of digits method, The Amortization method, The sinking fund method, Composite rate and composite life, Depletion.	
<b>Unit – III</b>	<b>Break-Even analysis</b>	<b>(08)</b>
	Deriving BEQ and BER, BEQ and BER variables, Cash Break-Even technique, The Break-Even point and the Target profit, Algebraic approach to the Break- Even point, The Break Even-Point when borrowing, Dual Break-Even Point, Applications of Break-Even point, BEQ and BER sensitivity to their variables, Limitations of Break-Even Analysis.	
<b>Unit – IV</b>	<b>Leverage</b>	<b>(06)</b>
	Operating Leverage, Fixed cost and Business risk, Financial Leverage, Total or Combined Leverage.	

**Course Outcomes:** Students will be able to...

1. apply capital budgeting techniques to evaluate investment projects in different scenarios.
2. analyze and interpret the effects of depreciation and depletion on asset values and profitability.
3. assess the strengths and limitations of break-even analysis as a decision-making tool.
4. develop strategies to optimize leverage levels for a company's capital structure.

**Reference Books:**

- 1) Hull, John C. Options, Futures and Other Derivatives, Pearson Education, New York, 9<sup>th</sup> ed., 2017.
- 2) Kosowski, Robert L., Salih N. Neftci and Marek Rutkowski, Principles of Financial Engineering, Academic Press, London, 3<sup>rd</sup> ed., 2015.
- 3) Ross, Sheldon M., An Introduction to Mathematical Finance: Options and Other Topics, Cambridge University Press, 2013.
- 4) Alhabeeb M. J., Mathematical Finance, John Wiley and Sons, Inc., Publication, 2012.
- 5) Baxter, Martin and Andrew Rennie, Financial Calculus: An Introduction to Derivative Pricing, Cambridge University Press, 2<sup>nd</sup> ed., 2003.

## BMT128: Investment

**Course Objectives:** Students should be able to...

1. learn how stocks are issued, bought and sold as well as the role of stock exchange in facilitating these transactions.
2. understand the risk associated with bond and mutual funds and manage these risks to protect investment.
3. study about call and put options and how they derive their value from underlying assets.
4. make more informed financial decisions and manage risk effectively.

Credits (Total Credits 2)	SEMESTER – I  BMT128: Investment	No. of hours per unit
<b>Unit – I</b>	<b>Stocks</b>	<b>(08)</b>
	Buying and Selling stocks, Common stock valuation, Cost of new issues of common stock, Stock value with two stage dividend growth, Cost of stock through CAPM, Other methods for common stock valuation, Valuation of preferred stock, Cost of preferred stock.	
<b>Unit – II</b>	<b>Bounds and Mutual Funds</b>	<b>(08)</b>
	Bond valuation, Premium and discount prices, Premium Amortization, Discount accumulation, Bound purchase price between interest days, Estimating yield rates, Duration, Fund evaluation, Loads, Performance measures, The effect of systematic risk, Dollar cost averaging.	
<b>Unit – III</b>	<b>Options</b>	<b>(08)</b>
	Dynamics of making profit with options, Intrinsic value of Calls and Puts, Time value of Calls and Puts, the delta ratio, Determinants of option value, Option valuation, Combined intrinsic values of options.	
<b>Unit – IV</b>	<b>Cost of Capital and Ratio Analysis</b>	<b>(06)</b>
	Before and After-tax cost of capital, Weighted average cost of capital, Ratio Analysis, The DuPont Model.	

**Course Outcomes:** Students will be able to...

1. utilize stock market research tools to analyze and evaluate individual stocks.
2. analyze yield curves to understand the relationship between yields and maturities.
3. assess the impact of implied volatility and market conditions on options premiums.
4. design a comprehensive cost of capital that incorporates various sources of capital and their respective costs.



**Reference Books:**

- 1) Hull, John C. Options, Futures and Other Derivatives, Pearson Education, New York, 9<sup>th</sup> ed., 2017.
- 2) Kosowski, Robert L., Salih N. Neftci and Marek Rutkowski, Principles of Financial Engineering, Academic Press, London, 3<sup>rd</sup> ed., 2015.
- 3) Ross, Sheldon M., An Introduction to Mathematical Finance: Options and Other Topics, Cambridge University Press, 2013.
- 4) Alhabeeb M. J., Mathematical Finance, John Wiley and Sons, Inc., Publication, 2012.
- 5) Baxter, Martin and Andrew Rennie, Financial Calculus: An Introduction to Derivative Pricing, Cambridge University Press, 2<sup>nd</sup> ed., 2003.

## **BMP129: Lab II (Based on BECT 127 and BECT 128)**

**Course Objectives:** Students should be able to...

1. understand the concept of depreciation and its importance in financial reporting.
2. learn the concept of leverage and its significance in financial decision making.
3. identify the different types of investment instruments such as stocks, bonds, mutual funds.
4. perform financial analysis and valuation of stocks and bonds to identify investment opportunities.

<b>Credits (Total Credits 2)</b>	<b>SEMESTER – II BMP129: Lab II (Based on BECT 127 and BECT 128) List of Practical (30)</b>	<b>No. of hours per Practical</b>
	<b>Part A (Based on BECT 127)</b>	
1	Computation of depreciation expense.	2
2	Preparation of depreciation schedule.	2
3	Comparison of financial impact of using different depreciation methods.	2
4	Analysis of asset replacement.	2
5	Tax effects of depreciation.	2
6	Computation of financial leverage.	2
7	Debt-to-Equity Ratio Analysis.	2
8	Analysis of Leverage and profitability.	2
9	Conduction of Breakeven analysis.	2
10	Computation of weighted average cost of capital.	2
11	Determination of the effect of financial leverage on earnings per share.	2
12	Evaluation of financial risk by leverage ratio.	2
13	Exploration of impact of leverage on the valuation.	2
14	Designing an optimal capital structure.	2
15	Assessment of effect of leverage on dividend policy.	2

	<b>Part B (Based on BECT 128)</b>	
1	Construction of investment portfolio.	2
2	Analysis of risk and return characteristics of investment assets.	2
3	Valuation of Stock.	2
4	Computation of present value of future cash flows for a bond.	2
5	Backtesting of investment strategy.	2
6	Analysis of performance of different sectors.	2
7	Analysis of real estate investment.	2
8	Evaluation of different exchange traded funds.	2
9	Designing risk management strategies.	2
10	Evaluation of the performance of an investment portfolio.	2
11	Analysis of Behavioural finance.	2
12	Preparation of a research report on selected investment opportunity.	2
13	Evaluation of alternative investment opportunities.	2
14	Analysis of macroeconomic factors and their potential impact on investment markets.	2
15	Developing a comprehensive investment plan for retirement.	2

**Course Outcomes:** Students should be able to...

1. apply the appropriate depreciation method to calculate the depreciation expense for a specific asset.
2. assess the risk associated with high levels of leverage.
3. evaluate the costs and fees associated with investment products and services.
4. design an investment plan that aligns with specific financial goals.

**Reference Books:**

- 1) Hull, John C. Options, Futures and Other Derivatives, Pearson Education, New York, 9<sup>th</sup> ed., 2017.
- 2) Kosowski, Robert L., Salih N. Neftci and Marek Rutkowski, Principles of Financial Engineering, Academic Press, London, 3<sup>rd</sup> ed., 2015.
- 3) Ross, Sheldon M., An Introduction to Mathematical Finance: Options and Other Topics, Cambridge University Press, 2013.
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## Indian Knowledge System

### Semester – I

#### IKS101: Indian Economy

**Course Objectives:** Students should be able to ...

1. gain the knowledge about nature of Indian economy.
2. understand the nexus between population growth and development related issues.
3. study about taking an overview of Indian economy.
4. learn the major problems and challenges before economy.

<b>Credits (Total Credits 2)</b>	<b>SEMESTER – I  IKS101: Indian Economy</b>	<b>No. of hours per unit</b>
<b>Unit – I</b>	<b>Nature of Indian Economy</b>	<b>(06)</b>
	1.1 India as an Under developed Economy 1.2 India as a Developing Economy 1.3 Natural Resources: Land, Water, Forest and Mineral resources 1.4 Infrastructure: Electricity, Transport, Communications	
<b>Unit – II</b>	<b>Population Growth and Economic Development</b>	<b>(08)</b>
	2.1 Trends in Size and Growth of Population – Sex Composition, Age Composition, Rural–Urban distribution, Migration-Smart City Mission 2.2 Causes of Population Growth and Remedies on Control 2.3 Population and Economic Development - Latest Population Policy 2.4 Human Resource Development: Education and Health – Latest Education Policy, Health Policy	
<b>Unit – III</b>	<b>Macro-Economic Overview of Indian Economy</b>	<b>(08)</b>
	3.1 Trends in NNP 3.2 Per Capita National Income 3.3 Service Led Growth 3.4 GDP by Industry Origin	
<b>Unit – IV</b>	<b>Major Problems of Indian Economy</b>	<b>(08)</b>
	4.1 Labour Force Growth and Occupational Structure 4.2 Employment and Unemployment 4.3 Poverty 4.4 Income Inequality	

**Course Outcomes:** Students will be able to ...

1. describe Vedic period and tradition in Mathematics.
2. sketch geometrical constructions using simple methods.
3. examine place value principal realisations and other realisations.
4. test various Vedic arithmetic methods for speed up calculations.

### Reference Books:

- 1) Sen, R. K. and B. Chatterjee (2001), Indian Economy: Agenda for 21st Century (Essays in honour of Prof. P. R. Brahmananda), Deep & Deep Publications, New Delhi.
- 2) Datt, R. (Ed.) (2001), Second Generation Economic Reforms in India, Deep & Deep Publications, New Delhi.
- 3) Srinivasan, T. N. (Ed.) (2000), Eight Lectures on India's Economic Reforms, Oxford University Press, Oxford.
- 4) Joshi, V. and I. M. D. Little (1999), India: Macro Economics and Political Economy, 1964-1991, Oxford University Press, New Delhi.
- 5) Byres, t. J. (Ed.) (1998), The Indian Economy: Major Debates Since Independence, Oxford University Press, New Delhi.
- 6) Rangarajan, C. (1998), Indian Economy: Essays on Money and Finance, UBS, New Delhi.
- 7) Kabra, K. N. (1997), Development Planning in India, Sage Publications, New Delhi.
- 8) Chatopadhyaya, M., P. Matiti and M. Rakshit (Eds.) (1996), Planning and Economic Policy in India – Evaluation and Lessons for the Future, Sage Publications, New Delhi.
- 9) Dandekar, V. M. (1996), The Indian Economy, 1947-92, Vol. II, Sage Publications, New Delhi.
- 10) Dantwala, M. L. (1996), Dilemmas of Growth: The Indian Experience, Sage Publications, New Delhi.

**B.Sc. (Economics) (Part-I) (Semester- II)**  
**Skill Enhancement Course**  
**(Introduced from June 2023)**  
**SEC103: Tally Operator**  
**Credit: 2**

**Course Objectives:** students should be able to...

- 1) learn basic financial concepts.
- 2) study accountancy and basic technique of tally operator.

Credit=1	SEMESTER-II SEC 103: Tally Operator	No. of hours per unit
<b>UNIT I</b>	<b>Role and Responsibilities</b>	<b>(07)</b>
	Trail balance, Profit & Loss Account, Balance Sheet, Day Book, Financial Statements, Trading Account Accounts Books and Reports, Inventory Books and Reports, Exception Reports, Statutory Reports, Stock management, Payroll Reports	
<b>UNIT II</b>	<b>Technical Knowledge</b>	<b>(08)</b>
	Finance related services, accountancy, examining company accounts, financial management tasks, GST, Backup and restore.	

**Practicals Based on Tally operator**

Credit=1	SEMESTER-II Practicals Based on Tally Operator	No. of contact hours
1	Tally the Balance sheet and report balance sheet.	3
2	Preparing Inventory Books and Reports.	3
3	GST Activation and adjustments.	3
4	Stock management report.	3
5	Backup and restore.	3
6	Creating a Company and Entering Opening Balances	3
7	Recording Sales Transactions	3
8	Entering Purchase Transactions	3
9	Bank Reconciliation	3
10	Generating Financial Reports	3

**Course Outcomes:** Student will be able to...

1. Tally the Balance sheet and report balance sheet.
2. Prepare Inventory Books and Reports.
3. Activating and adjusting GST.
4. Prepare stock management report.

**Recommended Book:**

1. Principles and practice of Accounting, Board of Studies, The Institute of chartered Accounts of India (ICAI), Sahitya Bhawan Publications, March 2019.
2. Getting started with Tally.ERP.9, Tally solution Pvt.Ltd. February 2011