INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-101   **Course Title:** Introduction to Economics

2. **Contact Hours:**   **L:** 2   **T:** 0   **P:** 0

3. **Examination Duration (Hrs.):**   **Theory:** 2   **Practical:** 0

4. **Relative Weightage:**   **CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40-50   **PRE:** 0

5. **Credits:** 2   **6. Semester:** Autumn

7. **Pre-requisite:** Nil   **8. Subject Area:** PCC

9. **Objective:** To provide basic understanding of economic principles/analysis.

10. **Details of the Course**

S.No.	Contents	Contact hours
1.	**The Central Concepts of Economics:** The Concepts of Scarcity, Choice, Opportunity Costs and Efficiency; The Modern Mixed Economy-Market and Government	5
2.	**Microeconomic Concepts:** Demand, Supply and Markets; Equilibrium and Surplus; Quotas, and Price Ceilings; Compare and Contrast Monopoly, Perfect Competition and Other Market Structures.	7
3.	**Macroeconomic Concepts:** Circular Flow, Measuring Economic Activity-Gross Domestic Product; Macroeconomic Challenges: Unemployment, Inflation and Macroeconomic Performance-Business Cycles	8
4.	**Growth and Development:** Sources of Economic Growth: Human Resources, Natural Resources, Capital, Technological Change and Innovation, The Challenge of Economic Development	4
5.	**Global Economy:** International Trade: The Nature of International Trade, The Principle of Comparative Advantage; Protectionism: Supply-and-Demand Analysis of Trade and Tariffs	4
	Total	**28**

11. **Suggested Books:**

S.No.	Name of Authors/Book/Publisher	Year of Publication / Reprint
1.	Economics, Paul A. Samuelson, William D. Nordhaus, McGraw-Hill; 19th Edition	2010
2.	Principles of Economics, N. Gregory Mankiw, Cengage Learning, 7th Edition	2015
3.	Economics-A Very Short Introduction, Partha Dasgupta, Oxford University Press, 1st Edition	2007
4.	Principles of Economics, Carl Menger, Ludwig von Mises Institute, 1st Edition Reprint	2007
5.	Economics: Principles and Policy, William J. Baumol, Alan S. Blinder, Cengage Learning, 11th Edition	2010

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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-102   **Course Title:** Introductory Microeconomics

2. **Contact Hours:**   L: 3   T: 1   P: 0

3. **Examination Duration (Hrs.):**   Theory: 3   Practical: 0

4. **Relative Weightage:**   CWS: 20-35   PRS: 0   MTE: 20-30   ETE: 40-50   PRE: 0

5. **Credits:** 4   6. **Semester:** Spring

7. **Pre-requisite:** Nil   8. **Subject Area:** PCC

9. **Objective:** To provide an understanding of consumer and producer behavior, markets and competition, and tools of comparative statics and their application to price theory.

10. **Details of the Course**

S.No.	Contents	Contact hours
1.	**Introduction:** Key concepts in Microeconomics; Concepts of Scarcity and Wants; Models and Methodology; Positive and Normative Analysis	2
2.	**Consumer Behaviour:** Theories of consumer behavior - Total and Marginal Utility; Cardinal and Ordinal Utility; Preference orderings and Indifference Curves; Marginal Rate of Substitution; Budget Constraint; Utility Maximisation; Derivation of demand; Concepts of Elasticity; Changes in prices and income and individual demand curve; Substitution and Income effects; Revealed preference approach; Aggregate demand	8
3.	**Producer Behaviour:** Short-run vs Long-run analysis; Technology and production sets; Production with single variable; Production with two or more variables; Production functions (for competitive firm) and Isoquants; Returns to Scale; Technological progress; Cost Concepts; Expansion path and long-run cost curves; Output and Profit maximization; Cost minimization; Duality theory in production; Multiproduct firms and cost dynamics	8
4.	**Competitive Market:** Prefect Competition-Assumptions; Demand and supply curves; Market equilibrium, stability and comparative static properties; Impact of taxes and subsidies on market equilibrium; Consumer and producers surplus; Firm equilibrium and supply curve in the short-run; Firm and industry equilibrium in the long-run; Constant, Increasing and decreasing cost industries; General equilibrium and Pareto optimality - fundamental theorems of welfare economics; Externalities and market failures	8
5.	**Imperfect Markets:** Imperfect competition and market structure; Pure monopoly; Short-run and long-run equilibrium; Profit maximization; Price discrimination; Bilateral monopoly; Single product monopoly; Durable goods monopolist; Multi-plant monopolist; Barrier to entry and natural monopoly; Welfare loss from monopoly; Dumping, tying and bundling; Monopsony	8
6.	**Monopolistic Competition and Oligopoly:** Characteristics of monopolistic and oligopolistic competition; Advertising and monopolistic competition; Output, price, and profit of a monopolistic competitor; Long-Run equilibrium in a monopolistically competitive industry; Models of oligopoly behavior –	8

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	Cartel model, contestable markets; Oligopoly model with homogeneous products; Oligopoly model with differentiated products	
	Total	**42**

11. Suggested Books:

S.No.	Name of Authors/Book/Publisher	Year of Publication / Reprint
1.	Intermediate Microeconomics with Calculus, H. R. Varian, W. W. Norton & Company, International Student Edition	2014
2.	Microeconomics, D. Acemoglu, D. Laibson and J. List, Pearson Education, 1st Edition	2019
3.	Microeconomics, P. Jeffrey, Pearson Education, 7th Edition	2019
4.	Microeconomic Theory: Basic Principles and Extensions, W. Nicholson and C. Snyder, Cengage India	2017
5.	Microeconomics, R. Pindyck and D. Rubinfeld, Pearson Education, 8th Edition	2017
6.	Microeconomics, E. Mansfield and G. Yohe, Viva-Norton, 11th Edition	2010
7.	Microeconomics, H. Gravelle and R. Rees, Pearson India, 3rd Edition	2007
8.	Microeconomics: Theory and Applications, A. Sen, Oxford University Press, 2nd Edition	2006

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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-103   **Course Title:** Computer Programming for Economists

2. **Contact Hours:**   **L:** 3   **T:** 0   **P:** 2

3. **Examination Duration (Hrs.):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage: CWS:** 10-25   **PRS:** 25   **MTE:** 15-25   **ETE:** 30-40   **PRE:** 0

5. **Credits:** 4   **6. Semester:** Autumn

7. **Pre-requisite:** Nil   **8. Subject Area:** ESC

9. **Objective:** To provide an understanding of different programming techniques and integrating it with Economics.

10. **Details of the Course**

S.No.	Contents	Contact hours
1.	**Introduction**: Programming concepts and paradigm; Development of programming languages; Structures of programming languages: Lexical structure, Syntactic structure, Contextual structure, Semantic structure; Understanding programming: Data types, Data structures, Automation basics ; Programming as social science.	8
2.	**Introduction to C/C++**: Getting started with C/C++; Control structures: Operators, Basic selection structures, Iteration structures; Complex types: Arrays and string, Pointer, Constants; Compound data types: Union, Array of structures using static memory allocation; Input and output: Standard input and output, Variable-length argument lists, File access; Recursive structures and applications.	10
3.	**Programming using Python**: Basic elements of Python; Conditional logic, Loops; Debugging Python code; Reading and writing to files: Working with database files, Text and CSV files; Obtaining data from the web: Using python to read from HTML files, JSON, API queries; Statistical calculations; Data visualization; Machine learning and text mining.	10
4.	**Programming using R**: Fundamentals of R; R and Rstudio: Working directory, Script, Vectors, Matrices, Data frames; Getting data into R; R for data science: Exploratory data analysis, Statistical simulation; R for machine learning: Lazy learning, Probabilistic learning, Forecasting numeric data.	7
5.	**MATLAB Programming**: Basic Matlab and introductory examples; Writing scripts and functions: Functions, Plotting curves, Root finding, Interpolation and extrapolation; Solving differential equations and Simulations; Data Input/Output: Importing from excel, text, and native Matlab files; User written functions: Function m-files, Anonymous functions.	7
Total		**42**

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11. Suggested Books:

S.No.	Name of Authors/Book/Publisher	Year of Publication / Reprint
1.	Brooker, Phillip. Programming with Python for Social Scientists, Sage.	2020
2.	Guttag, John. Introduction to Computation and Programming Using Python: With Application to Understanding Data, Second Edition, MIT Press.	2016
3.	Kaefer, F. & Kaefer, P. Introduction to Python Programming for Business and Social Science Applications, Sage.	2020
4.	Chen, Y. Introduction to Programming Languages, Sixth Edition, Kendall Hunt Publication Company.	2019
5.	Mueller, J., & Massaron, L. Machine Learning for Dummies, John Wiley & Sons.	2016
6.	Vries A., & Meys, J. R for Dummies, Second Edition, John Wiley and Sons.	2015
7.	Dayal, V. An Introduction to R for Quantitative Economics, Springer, India.	2015
8.	Kendrick, D., Mercado, R., Amman, H. Computational Economics, Princeton University Press.	2006

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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-104   **Course Title:** Introductory Macroeconomics

2. **Contact Hours:**   **L:** 3   **T:** 1   **P:** 0

3. **Examination Duration (Hrs.):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage:**   **CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40-50   **PRE:** 0

5. **Credits:** 4   6. **Semester:** Spring

7. **Pre-requisite:** Nil   8. **Subject Area:** PCC

9. **Objective:** To provide students a basic understanding of the principles of macroeconomics as they relate to how a country's economy works including the outputs, unemployment, inflation, fiscal policy, monetary policy and international trade of the economy.

10. **Details of the Course**

S.No.	Contents	Contact hours
1.	**National Income Accounting:** Structure, Key concepts, Measurements, and Circular flow of Income- for Closed and Open Economy; Money, Fiscal and Foreign Sector Variables- Concepts, Measurements	6
2.	**Behavioural and Technological Functions:** Consumption Functions-Absolute Income Hypothesis, Lifecycle and Permanent Income Hypothesis; Investment Functions-Keynesian; Money Demand and Supply Functions; Production Function	9
3.	**Business Cycles and Economic Models:** Business Cycles-Facts and Features; The Classical Model of the Business Cycle; The Keynesian Model of the Business Cycle- Simple Keynesian Cross Model of Income and Employment determination and the multiplier (in closed economy);	10
4.	**Business Cycles and Economic Models:** IS-LM Model -Hicks' IS-LM Synthesis; Fiscal and Monetary Policy: Role of Fiscal Policy and Monetary Policy in taming Business Cycles	9
5.	**Inflation and Unemployment:** Inflation-Theories, Philips Curve; Monetary Policy; Government Debt and Ricardian Equivalence; Measurement, Causes, and Effects; Unemployment-Types, Measurement, Causes, and Effects	8
	Total	42

11. **Suggested Books:**

S.No.	Name of Authors/Book/Publisher	Year of Publication / Reprint
1.	Macroeconomics, N. Gregory Mankiw, 10th Ed, Macmillan	2019
2.	Macroeconomics, Rudiger Dornbusch and Stanley Fischer and Richard Startz, 13th Ed., McGraw-Hill	2018
3.	Macroeconomics, Robert J. Gordon, 12th Ed., Pearson	2012
4.	Macroeconomics: Theories and Policies, Richard T. Froyen, 10th Ed., Pearson	2013
5.	Macroeconomics: Theory and Applications, G.S. Gupta, 4th Ed., McGraw Hill Education	2017

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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-106   **Course Title:** Basic Statistics

2. **Contact Hours:**   **L:** 3   **T:** 0   **P:** 2

3. **Examination Duration (Hrs.):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage:** **CWS:** 10-25   **PRS:** 25   **MTE:** 15-25   **ETE:** 30-40   **PRE:** 0

5. **Credits:** 4   6. **Semester:** Spring

7. **Pre-requisite:** Nil   8. **Subject Area:** PCC

9. **Objective:** To provide an understanding of interpretation of elementary statistics and analyze statistical data.

10. **Details of the Course**

S.No.	Contents	Contact hours
1.	**Introduction:** Samples versus Populations; Descriptive Statistics: Measures of Central Tendency, Measures of Dispersion, Measures of Position and Outliers; Graphical Summaries of Data and Some Related Issues: Relative Frequencies, Histograms, Boxplots; Distributions, Percentiles, and Percentile Ranks	6
2.	**Probability and Sampling Distribution:** The Meaning of Probability; Expected Values; Conditional Probability and Independence; The Binomial Probability Function; Discrete Probability Distributions; The Normal Probability Distribution: Properties of the Normal Distribution, The Standard Normal Distribution, Applications of the Normal Distribution; Sampling Distributions: Sampling Distribution of a Binomial Random Variable, Sampling Distribution of the Mean Under Normality, Non-Normality and the Sampling Distribution of the Sample Mean, Sampling Distribution of the Median	10
3.	**Estimation and Hypothesis Testing:** Hypotheses about Single Means (z and t); Estimation: Confidence Interval for the Mean: Known Variance, Confidence Intervals for the Mean: σ Not Known, Confidence Intervals for the Population Median; Hypothesis Testing: Testing Hypotheses about the Mean of a Normal Distribution, σ Known, Testing Hypotheses about the Mean of a Normal Distribution, σ Not Known	8
4.	**Correlation and Regression:** Simple Linear Regression: Ordinary Least Squares Regression, Inferences about the Slope and Intercept, The Coefficient of Determination, Testing the Significance of the Least-Squares Regression Model; Correlation	10
5.	**Inferences on Two or More than Two Samples:** Comparing the Means of Two Independent Groups, Comparing Two Dependent Groups, The ANOVA F Test for Independent Groups, Two-Way ANOVA; Chi-Square Goodness of Fit Test: Chi-Square Test for Independence and Homogeneity of Proportions	8
	Total	42

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11. Suggested Books:

S.No.	Name of Authors/Book/Publisher	Year of Publication / Reprint
1.	Basic Statistics, Rand R. Wilcox, Oxford University Press, 1st Edition	2009
2.	The Basic Practice of Statistics, David S. Moore, W. H. Freeman and Company New York, 1st Edition	2010
3.	Introduction to Mathematical Statistics, Robert V. Hogg, Joseph W. McKean, Allen T. Craig. Pearson Education, 7th Edition	2013
4.	A Modern Introduction to Probability and Statistics: Understanding Why and How, F.M. Dekking, C. Kraaikamp H.P. Lopuhaa¨ L.E. Meester, Springer- London, 1st Edition	2005
5.	Statistics-A Very Short Introduction, David J. Hand, Oxford University Press, 1st Edition	2008

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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-201   **Course Title:** Advanced Statistics

2. **Contact Hours/Week:**   **L:** 3   **T:** 0   **P:** 2

3. **Exam Duration (Hrs.):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage: CWS:** 10-25   **PRS:** 25   **MTE:** 15-25   **ETE:** 30-40   **PRE:** 0

5. **Credits:** 4   **6. Semester:** Autumn   **7. Subject Area:** PCC

8. **Pre-requisite:** Basic Statistics

9. **Objective:** To introduce students to advanced statistical methods.

10. **Details of the Course:**

S.No.	Contents	Contact Hours
1.	**Probability, Distributions, and Conditional Distributions:** Probability Set Functions, Random Variables, Probability Density Functions, Distribution Function, Conditional Probability, Marginal and Conditional Distributions, Stochastic Independence	6
2.	**Discrete and Continuous Distributions:** Binomial and Multinomial Distributions, Geometric Distribution, Negative Binomial, Hypergeometric Probability Distribution, Poisson Distributions, Uniform Distributions, Normal (multivariate) Distribution, t and F Distributions, Gamma and Chi-square Distribution, Beta Distribution	6
3.	**Distributions of Functions of Random Variables:** Transformations of Variables of Discrete Type, Transformations of Variables of Continuous Type, Extensions of Change-of-Variable Technique, Distributions of Order Statistics, Moment Generating Function Method, Expectations of Functions of Random Variables	6
4.	**Limiting Distributions:** Limiting Distributions, Stochastic Convergence, Limiting Moment-Generating Functions, Central Limit Theorem, Some Theorems on Limiting Distributions	4
5.	**Estimation:** Point Estimation, Confidence Intervals, Bayesian Estimates	6
6.	**Statistical Hypotheses:** Examples and Definitions, Likelihood Ratio Tests, Chi-square Tests, Test of Equality of Means, Analysis of Variance, Regression	8
7.	**Non-parametric Statistics:** Non-parametric Confidence Intervals, Nonparametric Hypothesis Tests (Sign Test, Wilcoxon Signed Rank Test, Median Test, Wilcoxon Rank Sum Test, Kruskal-Wallis, Friedman Test)	6
	Total	**42**

11. List of Practical: Applications will be demonstrated using *R*-software

S.No.	Topic
1.	Probability, Conditional Probability, and Bayes' Theorem
2.	Discrete and Continuous Random Variables
3.	Multivariate Random Variables
4.	Sampling Distributions and Limit Theorems
5.	Preliminary Data Analysis: Exploration and Visualization
6.	Parameter Estimation: Method of Moments, MLE
7.	Properties and Sampling Distributions of Estimators
8.	Hypothesis Testing and Confidence Intervals
9.	Categorical Data and Non-parametric Tests
10.	Linear Models and Extensions
11.	ANOVA
12.	Bayesian Estimation and Inference
13.	Empirical Methods (Bootstrap, EM Algorithm, MCMC)

12. Suggested Books:

S.No.	Name of Authors/Book/Publisher	Year of Publication/Reprint
1.	R. V. Hogg, J. W. McKean, A. T. Craig, Introduction to Mathematical Statistics, 7th Edition, Pearson Education	2013
2.	M. H. DeGroot, M. J. Schervish, Probability and Statistics, 4th Edition, Pearson Education	2013
3.	K. M. Ramachandran, C. P. Tsokos, Mathematical Statistics with Applications in R, 2nd Edition, Academic Press	2020
4.	Larry A. Wasserman, All of Statistics: A Concise Course in Statistical Inference, 2nd Edition, Springer	2013

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-202   **Course Title:** Monetary Economics

2. **Contact Hours:**   **L:** 3   **T:** 1   **P:** 0

3. **Examination Duration (Hrs):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage: CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40-50   **PRE:** 0

5. **Credits:** 4   **6. Semester:** Spring   **7. Subject Area:** PCC

8. **Pre-requisite:** Introduction to Economics

9. **Objective:** To develop an understanding of the theories of money, monetary policy and real effects of monetary transmission mechanisms on the economy.

10. **Details of Course**

S.No.	Contents	Contact hours
1.	**Introduction to Money:** Money: Definition, Roles and Functions, The Role of Money in the Macroeconomy, Changing Paradigms in Monetary Theory	4
2.	**Demand for Money:** Demand for Money: Money Demand Function, Theories of Money Demand, The Classical School and the Neutrality of Money, Quantity Theory of Money, Walras' and Say's Laws, Money in the Utility Functions, Demand for Money vis-a-vis the Demand for Other Commodities	9
3.	**Supply of Money:** Monetary Aggregates and Money Supply Function, Process of Credit Creation, Money Multiplier and Monetary Base, Fiscal Balance and the Money Supply Process	9
4.	**Money Market Equilibrium & Term Structure of Interest Rates:** Money Market and its Equilibrium, Determination of Interest Rate, Money in General Equilibrium Framework, Money and Open Economy, Behaviour of Interest Rates, Interest Rate and Rate of Return, Yield Curve, Expectations Hypothesis, Segmentation Hypothesis and Liquidity Premium Hypothesis	10
5.	**Monetary Policy:** Conventional and Unconventional Tools, Goals and Conduct of Monetary Policy, Transmission Mechanisms of Monetary Policy, Monetary Policy at the Zero Lower Bound, Monetary Policy Rules: Interest Rate Targeting and Monetary Targeting (Rules versus Discretion), Inflation Targeting, Monetary Policy in Action: India vis-a-vis Other Developed and Developing Economies	10
	Total	**42**

11. Suggested Books

S.No.	Name of Authors/Book/Publisher	Year of Publication/Reprint
1.	Carl E.Walsh, Monetary Theory and Policy, MIT Press, 3rd Edition.	2010
2.	Lewis, M.K. and P.D. Mizen, Monetary Economics. Oxford University Press.	2000
3.	Bennett T. McCallum, Monetary Economics: Theory and Policy, Macmillan, Facsimile Edition	1989
4.	Mishkin, F., Economics of Money, Banking and Financial Markets, 11th ed., Pearson, 2019	2019
5.	Mohan, R. Monetary Policy in a Globalized Economy: A Practioner's View, Oxford University Press.	2011

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-203   **Course Title:** Advanced Microeconomics
2. **Contact Hours:**   L: 3   T: 1   P: 0
3. **Examination Duration (Hrs):** Theory   3   Practical   0
4. **Relative Weightage**: **CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40-50   **PRE:** 0
5. **Credits:** 4   **6. Semester:** Autumn   **7. Subject Area:** PCC
6. **Pre-requisite**: Introductory Microeconomics
7. **Objective:** To develop an understanding of the economic theories for decision-making under risk and uncertainty, and information economics.

10. Details of the course

S.No.	Contents	Contact Hours
1.	**Advanced Topics in Choice under Certainty:** Axioms of Choice, Marshallian Demand function, Indirect Utility, Roy's Identity, Expenditure function, Hicksian Demand Curve, Duality in Consumption, Shephard's Lemma, Hicks and Slutsky price decomposition	9
2.	**Choice under Risk and Uncertainty:** Defining risk and uncertainty, Limitations of the Ordinal Utility Theory, Introduction to Probability, Gambling as a Risky Event, Expected Utility Theory (EUT), Utility of Money, Certainty Equivalent, Risk Aversion, Measurement of Risk Aversion, Limitations of EUT, Allais Paradox, Ellsberg Paradox, Behavioral Economics – Prospect Theory, Loss Aversion, Ambiguity Aversion and Discounting	9
3.	**Game Theory:** Basic structure of a game, Simple examples, Use of Games in Economic Theories - Static Games, Dynamic Games, Iterations, Dominant Strategy Equilibrium, Nash Equilibrium, Prisoner's Dilemma, Mixed Strategies, Maximin Strategies, Zero-sum Games, Induction - Backward and Forward.	8
4.	**Information Economics:** Asymmetric Information, Adverse Selection, Moral Hazard, Market Signaling, Principal Agent Problem, Cost of Information	8
5.	**General Equilibrium Analysis:** Pure Exchange: The Edgeworth Box, Pareto Optimality, Two Theorems in Welfare Economics, The Walrasian Model**,** General Equilibrium Analysis Under Uncertainty, The Arrow-Debreu Equilibrium, Social Choice Theory, Arrow's Impossibility Theorem.	8
Total		**42**

11. Suggested Books

S.No.	Name of Authors/Book/Publisher	Year of Publication/Reprint
1.	Barr, Nicholas. The Economics of the Welfare State. 6th Edition, Oxford University Press, Global	2020
2.	Varian, Hal. Microeconomic Analysis. 3rd ed. New York, NY, Norton	2019
3.	Nicholson, Walter, and Christopher M. Snyder. Intermediate microeconomics and its application. 12th Edition. Cengage Learning.	2017
4.	Jehle, Geoffrey, and Philip Reny. Advanced Microeconomic Theory, Pearson, 3rd Edition	2010
5.	Mas-Collel, Andreu, Michael D. Whinston, and Jerry R. Green. Microeconomic Theory. New York, NY: Oxford University Press.	1995

S.No.	Name of Authors/Book/Publisher	Year of Publication/Reprint

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code**: HSN-204   **Course Title:** Advanced Development Economics
2. **Contact Hours:**   **L:** 3   **T:** 1   **P:** 0
3. **Examination Duration** (Hrs):   Theory: 3   Practical: 0
4. **Relative Weightage: CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40- 50   **PRE:** 0
5. **Credits:** 4   **6. Semester**: Spring   **7. Subject Area**: PCC
6. **Pre-requisite**: Elementary Development Economics
7. **Objective:** To understand contemporary topics in development economics by incorporating finance and international trade concepts.

10. **Details of Course**

S.No.	Contents	Contact Hours
1.	**Study of Economic Development:** Stylized facts and evolving principles in economic development; Development and equity – poverty-growth-inequality triangle, development gap and income distribution, poverty-weighted growth rates.	7
2.	**Factors in Development Process:** Capital accumulation – the role of capital and the technical progress in development, infrastructure investment; Human capital – education, returns to education, policies to reduce the gender gap, impact of nutrition and health on development; Child labour; Health systems policy; Role of women in economic development.	9
3.	**Financing Economic Development:** Financing from domestic resources – capacity to save, willingness to save; Financial intermediaries; Informal financial sector; Rural financial intermediaries and microcredit; Fiscal policy and taxation; Inflation, saving, and growth; Keynesian approach to financing of development; Quantity theory approach to financing of development.	8
4.	**International Trade, Aid, and Development:** Trade policy – static vs. dynamic gains; Trade liberalization, Theory of protection, Import substitution vs. export promotion, Trade vs. aid; Role of foreign borrowing; Types of international capital flows; Macroeconomic impact of international aid; Remittances; Foreign direct investment and multinational corporations.	9
5.	**BOP, IMF, and Development:** Balance of payments (BOP) – deficits and debts, policy issues, debt crisis in 1980s; Terms of trade; Exchange rate and devaluation; IMF supply-side approach to devaluation; IMF lending and criticisms; Special drawing rights and developing countries; Global financial crisis and developing countries.	9
	Total	**42**

11. Suggested Books

S.No.	Name of Books/Author/Publisher	Year of Publication/Reprint
1.	Todaro and Smith, Economic Development, 11th Edition, Addison Wesley	2011
2.	Debraj Ray, Development Economics, Oxford University Press	2009
3.	Dwight H. Perkins, Steven Radelet, and David L. Lindauer, Economics of Development, 7th Edition, W.W. Norton & Co.	2012
4.	Amartya Sen, Development as Freedom, Anchor Books	2000
5.	Meier, Gerald M. and James E. Rauch, Leading Issues in Economic Development, 8th Edition, Oxford University Press	2005
6.	Thirlwall and Pacheco-López, Economics of Development, 10th Ed., Bloomsbury Publishing	2017

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-205   **Course Title:** Advanced Macroeconomics

2. **Contact Hours:**   **L:** 3   **T:** 1   **P:** 0

3. **Examination Duration (Hrs):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage: CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40- 50   **PRE:** 0

5. **Credits:** 4   **6. Semester:** Autumn   **7. Subject Area:** PCC

8. **Pre-requisite:** Introduction to Economics

9. **Objective:** To provide students an understanding of contemporary macroeconomics theories by incorporating different schools of thought and their policy implications.

10. **Details of the Course**

S.No.	Contents	Contact Hours
1.	**The Open Economy:** Structure and Key Concepts - Export, Import, and Income Identity; Determinants of Trade - Export and Import Functions; International Capital Flows and Trade Balance - Determinants of Capital Flows; Foreign Exchange Rate System and Determinants of Exchange Rates; Effects of Trade Policies	8
2.	**Business Cycles and Economic Models in an Open Economy:** Mundel-Fleming Model (Fixed and Flexible Exchange Rate) under Perfect and Imperfect Capital Mobility; Keynesian (AD-AS-BP) Flexible Price Model (Fixed and Flexible Exchange Rate)-Internal and External Equilibrium	10
3.	**The Resurgence of Neoclassicism:** Monetarism-Friedman's Modern Quantity Theory of Money, The Phillip's Curve and the Natural Rate of Hypothesis, Expectations-Augmented Phillip's Curve, Accelerationist Hypothesis and NAIRU	7
4.	**New Classical Economics and Real Business Cycle Theory:** Microeconomic foundations of Macroeconomics – Friedman's Workers' Fooling Model, Lucas Information Barriers Model, Real Business Cycle Models - Effects of a Positive Technology Shock	7
5.	**New Keynesian Economics and New Consensus Macroeconomics:** Sticky Price (Menu Cost) Models, Efficiency Wage Models, Insider–Outsider Models and Hysteresis; New Consensus Macroeconomics (NCM): Theoretical Aspects and Monetary Policy in the NCM, NCM Critique: Policy Implications	10
	Total	**42**

11. Suggested Books

S.No.	Name of Books/Author/Publisher	Year of Publication/Reprint
1.	N. Gregory Mankiw, Macroeconomics, 10th Edition, Macmillan	2019
2.	Rudiger Dornbusch and Stanley Fischer and Richard Startz, Macroeconomics,13th Edition, McGraw-Hill	2018
3.	Richard T. Froyen, Macroeconomics: Theories and Policies, 10th Edition, Pearson	2013
4.	Angus C. Chu, Advanced Macroeconomics: An Introduction For Undergraduates, World Scientific Europe Ltd	2020
5.	Ben J. Heijdra, Foundations of Modern Macroeconomics Oxford: Oxford University Press	2017

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-206   **Course Title:** Introduction to Econometric Theory

2. **Contact Hours:**   L: 3   T: 0   P: 2

3. **Examination Duration (Hrs):** Theory   3   Practical   0

4. **Relative Weightage**: **CWS:** 10-25   **PRS:** 25   **MTE:** 15-25   **ETE:** 30-40   **PRE:** 0

5. **Credits:** 4   **6. Semester:** Spring   **7. Subject Area:** PCC

8. **Pre-requisite**: NIL

9. **Objective:** To provide an understanding of basic econometric methods for economic analysis.

10. **Details of the course**

S.No.	Contents	Contact Hours
1.	**Simple Linear Regression Model:** Properties of Simple Linear Regression Model, Deriving Ordinary Least Square (OLS) Estimates, Goodness of fit, Expected values and variance of OLS estimators	9
2.	**Multiple Linear Regression Model:** Obtaining OLS estimates, Interpretation of coefficients, Expected Values of OLS estimators, Omitted Variable Bias, Variance of OLS estimators, The Gauss Markov Theorem, Regression with non-linear variables	9
3.	**Statistical Inference and OLS Asymptotics:** Sampling distribution of Estimators, t-test, p-values, Confidence Intervals, F-test, R-square and Adjusted R-square, Consistency of estimator, Asymptotic Normality and Large Sample Inference, Asymptotic Efficiency of OLS	8
4.	**Violations in OLS Assumptions:** Non-normality, Multicollinearity, Heteroskedasticity, Autocorrelation, Robust Inference after OLS Estimation, Consequences, Testing, Remedial measures	10
5.	**Multiple Regression Analysis with Dummy Independent Variables:** Single Dummy, Multiple dummies, Interaction among dummies, Dummy Variable Trap, Dummy Variable Approach	6
	Total	**42**

11. **List of Practical:**

S.No.	Topic
1.	Estimation of Sample Regression Function and OLS Estimates using Economic Data
2.	Testing Hypotheses and Linear Restrictions about Population Regression Coefficients, & Variances and Standard Errors of OLS Estimators
3.	R^2 as a measure of Goodness of Fit and Overall Significance of a Regression
4.	Data Scaling and OLS estimates
5.	Comparison of Simple and Multiple Regression Estimates
6.	Irrelevant variables & Omitted variable bias
7.	Outliers, Distribution and Normality of Error Term
8.	Log-linear, Double-log, or Constant Elasticity Models- Cobb-Douglas Production Function
9.	Estimation of Log-lin or Linear-log, Polynomial Regression Models and Growth Rates

10.	Numerical Exercise on Large Sample Test
11.	Detection and Remedies of Multicollinearity in Multiple Regression using Economic Data
12.	Detection and Remedies of Heteroscedasticity using Economic Data
13.	Detection and Remedies of Autocorrelation using Economic Data
14.	Use of Dummy Variables in Seasonal Data and Expanded Sales Function

12. Suggested Books

S.No.	Name of Books/Author/Publisher	Year of Publication/Reprint
1.	J.M. Wooldridge, Introductory Econometrics: A Modern Approach, Cengage, 7nd Edition	2019
2.	J.H. Stock and M.W. Watson, Introduction to Econometrics, Addison Wesley, 3rd Edition	2017
3.	R. Davidson. Econometric Theory and Methods, Revised Edition, Oxford University Press	2009
4.	Damodar Gujarati, and Dawn Porter, Basic Econometrics, McGraw Hill, 6th Edition	2020

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: Department of Humanities and Social Sciences

1. **Subject Code:** HSN-207   **Course Title:** Elementary Development Economics

2. **Contact Hours:**   **L:** 3   **T:** 1   **P:** 0

3. **Examination Duration (Hrs):**   **Theory:** 3   **Practical:** 0

4. **Relative Weightage: CWS:** 20-35   **PRS:** 0   **MTE:** 20-30   **ETE:** 40- 50   **PRE:** 0

5. **Credits:** 4   **6. Semester:** Autumn   **7. Subject Area:** PCC

6. **Pre-requisite:** Nil

7. **Objective:** To introduce fundamentals of development economics along with a discussion of development theories, issues, and policy intervention.

10. **Details of the Course**

S.No.	Contents	Contact Hours
1.	**Principles of Economic Development:** Nature of Development Economics; Growth vs Development Debate; Evolution of Development Economics Over time; Millenium Development Goals (MDGs) and Sustainable Development Goals (SDGs); Basic Indicators of Development, Traditional vs. New Human Development Index (HDI); Characteristics of Developing World; Standard of Living Differences – Assessing whether Convergence of Living Standards Exist	8
2.	**Theories in Economic Development:** Classical theories – Rostow model, Harrod-Domar model; Structural Change Models – Lewis-Fei-Ranis Model; Dependency Theory; Traditional Neoclassical Model; Big Push Model; O-Ring Model; Vicious Circle of Poverty	9
3.	**Poverty and Inequality:** Poverty Measurement – Absolute and Relative Poverty, Rural Poverty, Women and Poverty; Inequality – Measurement, Kuznet's Inverted U-Hypothesis; Policy Options – Areas of Intervention, Progressive Income and Wealth Taxes; Direct Transfer Payments, Public Provision of Goods and Services, Multidimensional Poverty Index and its Measurement	9
4.	**Various Issues in Developmental growth:** Dualism – Regional Inequalities, Theories of Dependence and Unequal Exchange; Population Growth – Costs and Benefits, Low-Level Equilibrium Trap Model, Migration and Development– Urbanization and Rural-Urban Migration, Harris Todaro Model; Development and Environment – Basic Issues, Economic Models of Environmental Issues and Policy Measures	10
5.	**Policymaking and Role of Institutions in Development:** Models in Development Planning; State vs Market Debate in Development Planning; Washington Consensus; Role of Civil Society in Development; Governance and Reform	6
	Total	**42**

11. Suggested Books

S.No.	Name of Books/Author/Publisher	Year of Publication / Reprint
1.	Todaro and Smith, Economic Development, 11th Edition, Addison Wesley	2011
2.	Debraj Ray, Development Economics, Oxford University Press	2009
3.	Dwight H. Perkins, Steven Radelet, and David L. Lindauer, Economics of Development, 7th Edition, W.W. Norton & Co.	2012
4.	Amartya Sen, Development as Freedom, Anchor Books	2000
5.	Meier, Gerald M. and James E. Rauch, Leading Issues in Economic Development, 8th Edition, Oxford University Press	2005
6.	Thirlwall and Pacheco-López, Economics of Development, 10th Ed., Bloomsbury Publishing	2017