

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 502** Course Title: **Microeconomics I**

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

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

4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: **Nil**

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

10. Details of Course:

S. No.	Contents	Contact hours
1	Consumer Behaviour: Theories of consumer behavior, preference orderings, demand, duality theory, revealed preference & aggregate demand	6
2	Producer Behaviour: Technology and production sets, costs and production functions (for competitive firm), cost minimization, profit maximization & duality theory once more, aggregate supply	8
3	Competitive Market: Equilibrium in a competitive market, stability and comparative static properties, general equilibrium and Pareto optimality - fundamental theorems of welfare economics, externalities and market failures	8
4	Imperfect Markets: Imperfect competition and market structure, bilateral monopoly, single product monopoly, discriminating monopoly, durable goods monopoly, recycling, leasing versus selling & the Coase conjecture; Monopsony and monopolistic market structure	6
5	Game Theory with Applications to Oligopoly Theory: Game Theory: Extensive and normal form representation of games, Nash equilibrium (in pure and mixed strategies), definition and existence; subgame perfection in dynamic games. Applications: strategic behaviour of firms in a market (Bertrand,	8

	Cournot and Stackelberg models) and entry deterrence.	
6	Markets for Inputs: Price and employment of inputs, the firm's demand curve-one variable input and several variable inputs, market demand curve and supply curve, equilibrium price and employment of an input, rent, imperfectly competitive output markets	6
	Total	42

11. Suggested Books:

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Hal R. Varian, <i>Microeconomic Analysis</i> , W. W. Norton & Company, 3 rd Edition	2010
2	Andreu Mas-colell, Michael D. Whinston and Jerry R. Green John, <i>Microeconomic Theory</i> , Oxford University Press, 1 st Edition	2012
3	Geoffrey Alexander Jehle and Philip J. Reny, <i>Advanced Microeconomic Theory</i> , Financial Times Prentice Hall, 3 rd Revised Edition	2011
4	Hal R. Varian, <i>Intermediate Microeconomics with Calculus</i> , W. W. Norton & Company, International Student Edition	2014
5	H. Gravelle and R. Rees, <i>Microeconomics</i> , Pearson India, 3 rd Edition	2007
6	E. Mansfield and G. Yohe, <i>Microeconomics</i> , Viva-Norton, 11 th Edition	2010

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 503** Course Title: **Macroeconomics I**

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

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

4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: **Nil**

9. Objective: To impart knowledge of working of the whole economy: the determination of income, output, employment, savings, interest rates, inflation and macroeconomic policies.

10. Details of Course:

S. No.	Contents	Contact hours
1	Introduction: Macroeconomic concepts and issues	2
2	National Income Accounting: National income accounting structure, key concepts, measurements and difficulties, and circular flow of income- for closed and open economy; GNP and welfare, Inter-temporal and international comparisons of national income, Social accounting and its significance, Green GDP, Beyond GDP	7
3	Income and Employment Theory: Aggregate Demand and aggregate supply; Schools in Macroeconomics: Classical to Neo-Keynesian, Multiplier and accelerator principles; Equilibrium in the product, labour and money markets	6
4	IS-LM Model: Adjustment towards equilibrium, multiplier analysis, role of government in terms of monetary and fiscal policy	5
5	Consumption and Saving: Consumption under certainty- Life-Cycle and Permanent Income Hypothesis; Consumption under uncertainty-The Modern Approach, Random Walk Hypothesis; Consumption and Risky Asset; Beyond the Permanent Income Hypothesis	7

6	Inflation and Unemployment: Inflation- theories, measurement, causes, effects and social costs; Unemployment, the demand for and the supply of labour, Wage rigidity; Inflation-unemployment trade-off, Phillips curve, inflation targeting, Seignorage and Inflation Problems, Non-accelerating inflation rate of unemployment, Inflationary expectations- Adaptive and rational expectations hypothesis	8
7	Investment Theories: Keynesian, Post-Keynesian, Neo-Keynesian (Jorgenson approach), Lags in investment function	7
	Total	42

11. Suggested Books :

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Gregory Mankiw, <i>Macroeconomics</i> , Macmillan, 8 th Edition	2013
2	Bernanke B.S., Olekalns, N. and H. R. Frank, <i>Principles of Macroeconomics</i> , McGraw-Hill, 4 th Edition	2014
3	Errol D'Souza, <i>Macro Economics</i> , Pearson Education, Pearson, 2 nd Edition.	2012
4	Richard T. Froyen, <i>Macroeconomics: Theories and Policies</i> , Pearson Education, Pearson, 10 th Edition.	2014

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 504** Course Title: **Mathematics for Economists**

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

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

4. Relative Weightage: **CWS : 25** **PRS : 0** **MTE : 25** **ETE : 50** **PRE : 0**

5. Credits: **3** 6. Semester: **Autumn** 7. Subject Area: **PCC**

8. Pre-requisite: **Nil**

9. Objective: To introduce the mathematical tools and techniques necessary for understanding economic theories and their real-life applications.

10. Details of Course:

S. No.	Contents	Contact hours
1.	Introduction to Mathematical Economics: Economic models; Review of fundamental concepts- Real number system, sets, relations and functions	2
2.	Linear Models and Matrix Algebra: Solving univariate and Multivariate Systems of Linear Equations, Basic matrix operations, Determinant; Applications to analysis of Markets and National Income Accounting	6
3.	Use of Differentiation in Economic Analysis: Partial & Total Derivatives; Tests of continuity and monotonicity of a function; Average and Marginal concepts; Elasticity	5
4.	Optimization and Equilibrium: Maxima and minima; Unconstrained optimization techniques; Constrained optimization techniques - Lagrange Multiplier Method; Application to consumer behavior, production and costs.	5
5.	Integral Calculus and Dynamic Analysis: First and higher order ordinary differential equations; Simultaneous differential equations-Dynamic Input-output models; Integral calculus application to welfare analysis	5
6.	Mathematical Programming: Simple linear programming models; Duality Theorem; Non-Linear Programming	5
	Total	28

11. Suggested Books :

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1.	Alpha C Chiang & Kevin Wainwright, <i>Fundamental Methods of Mathematical Economics</i> , McGraw Hill Education, 4 th Edition	2013
2.	Carl P. Simon, <i>Mathematics for Economists</i> , Viva Books	2010
3.	Sydsaeter, K., Hammond, P. J. and Strom, A., <i>Essential Mathematics for Economic Analysis</i> , Pearson, 4 th Edition	2012
4.	Sydsaeter, K., Hammond, P. J. and Strom, A., <i>Further Mathematics for Economic Analysis</i> , Pearson, 2 nd Edition	2008

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 505** Course Title: **Development Economics**

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

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

4. Relative Weightage: **CWS : 25 PRS: 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: **Nil**

9. Objective: To impart knowledge of various development theories, strategies and issues.

10. Details of Course:

S. No.	Contents	Contact Hours
1	Introduction: Basic concepts of growth and development, inclusive growth, change in the meaning of development over a period of time, socio-economic development indicators	4
2	Growth, Poverty and Inequality: Uni- and multi-dimensional concepts of poverty, poverty indicators, poverty and vulnerability, inequality and development; Inverted-U Hypothesis; Measurement of inequality (Lorenz curve, Gini coefficient, Theil index); Inequality axioms	6
3	Theories of Economic Growth: Classical, Keynesian, post-Keynesian, Neo-Keynesian and Neo-Classical	7
4	Strategies of Economic Development: The Big Push theory of industrialization; the Rostow's Theory of Stages of Growth; the Balanced versus Unbalanced Growth theories; Economic Dualism.	6
5	Institutions and Economic Development: Types of institutions- Formal and informal, government, private and non-governmental; Property rights, legal systems, rule of law; Contribution of institutions to economic growth and efficiency; Role of civil societies in economic development, The rights-based approach to development; social capital and development	7
6	Population and Economic Development: Role of population growth in the development process, Population growth and living standards, Low Level Equilibrium trap; Demographic dividend; Migration and development	6
7	Structural Adjustment and Development:	6

	The fall of the centrally planned economies; State versus Market; Effects of Structural Adjustment on economic growth; Structural adjustment and stabilization policies of IMF and World Bank	
	Total	42

11. Suggested Books:

S. No.	Author (s)/Title/ Publisher	Year of Publication/ Reprint
1	A.P. Thirlwall, <i>Growth and Development</i> , Palgrave Macmillan, 8 th Edition	2006
2	Michael P. Todaro and Stephen C. Smith, <i>Economic Development</i> , Prentice Hall, 11 th Edition	2011
3	K. Staudt, <i>Managing Development</i> , Sage Publications	1991
4	Subrata Ghatak, <i>Introduction to Development Economics</i> , Routledge, 4 th Edition	2003
5	Ray, Debraj, <i>Development Economics</i> , Princeton University Press	1998
6	World Development Reports, World Bank	Annual

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 506** Course Title: **Money, Banking, and Financial Markets**

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

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

4. Relative Weightage: **CWS : 25** **PRS : 0** **MTE : 25** **ETE : 50** **PRE :0**

5. Credits: 3 6. Semester: **Autumn** 7. Subject Area: **PCC**

8. Pre-requisite: **Nil**

9. Objective: To provide knowledge of economic principles that underlies the role of money in the economy: the operation of banks and other financial institutions and the impact of credit and monetary policies on the economy.

10. Details of Course:

S. No.	Contents	Contact hours
1	Introduction: Understanding 'money'- Functions, Evolution and Measures of Money; Overview of financial system and markets	2
2	Demand for and Supply of Money: Money Demand function- Classical and Keynesian approaches to money demand, Quantity theory of money, Keynes' liquidity preference theory; Neutrality of money; Friedman's modern quantity theory of money, Baumol-Tobin Model; Money in IS-LM framework	5
3	Structure of Interest Rates: Behaviour and term structure of interest rates, Changes in Equilibrium Interest rate, Yield curve and Theories on Term Structure of Interest rates- Expectations Theory, Segmented Market, Liquidity Premium	5
4	Money and Capital Markets: Instruments, targets and functions, Banking Industry- structure, role and performance; NBFIs and NBFCs; Development Financial institutions, Financial reforms and policies	7
5	Advanced Topics in Banking Finance: Market micro-structure, Role of regulation and incentives, International standards	3
6	Central Banking and Monetary Policy: Role and functions of Central Bank; Credit policy, Monetary	6

	policy- tools, strategy and effects, Policy rules vs. discretion, Optimal monetary policy	
	Total	28

11. Suggested Books :

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Frederic S. Mishkin, <i>Economics of Money, Banking, and Financial Markets</i> , Prentice Hall, 10 th Edition.	2012
2	Carl E. Walsh, <i>Monetary Theory and Policy</i> , MIT Press, 3 rd Edition.	2010
3	Bennett T. McCallum, <i>Monetary Economics: Theory and Policy</i> , Macmillan, Facsimile Edition	1989
4	L M Bhole, and Jitendra Mahakud, <i>Financial Institutions and Markets</i> , Tata McGraw-Hill Education, 5 th Edition	2009
5	Annual Reports, Reserve Bank of India	Annual

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 507** Course Title: **Microeconomics II**

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

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

4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: Elementary knowledge of mathematics and intermediate microeconomics.

9. Objective: To develop understanding on decision making under uncertainty, advance game theory, role of information in economic analysis and current topics in microeconomic theory.

10. Details of Course

S. No.	Contents	Contact hours
1	Decision-making under Uncertainty: Decision making under risk, decision making under uncertainty, attitudes towards risk - applications of theories to understand lotteries and gambling, stochastic dominance, expected utility theorem, critiques of expected utility theory, measurement of risk aversion.	8
2	Game Theory under Incomplete Information: Static and Dynamic Games of Incomplete information - Concepts and applications Principal agent models - Hidden action and hidden information	8
3	Information Economics: Market Failure under adverse selection, signaling models, screening models (will address price discrimination by a monopolist when buyer type is "private" information), optimal contract design in a moral hazard (hidden action model), applications	9
4	Special Topics 1: (i) Mechanism design with money and without money (ii) Applications: Spectrum auctions, coal auctions, school choice, kidney exchange, etc.	9
5	Special Topics 2: (i) Network economics (ii) Law and Economics	8

	Total	42
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11. Suggested Books:

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Hal R. Varian, <i>Microeconomic Analysis</i> , W. W. Norton & Company, 3 rd Edition	2010
2	James Bergin, <i>Microeconomic theory: A concise course</i> , Oxford University Press, 1 st Edition	2005
3	Martin J Osborne, <i>An Introduction to Game Theory</i> , Oxford University Press	2003
4	Nicholas Barr, <i>Economics of the Welfare State</i> , Oxford University Press, 5 th Edition	2012
5	Sanjeev Goyal, <i>Connections: An Introduction to the Economics of Networks</i> , Princeton University Press,	2009
6	Robert D. Cooter and Thomas S. Ulen, <i>Law and Economics</i> , Addison-Wesley, New York, 6 th Edition	2011

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 508** Course Title: **Macroeconomics II**

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

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

4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: Basic understanding of macroeconomics

9. Objective: To provide knowledge to analyze and develop theories and models describing macroeconomic dynamics.

10. Details of Course:

S. No.	Contents	Contact hours
1	Dynamic General Equilibrium Model: Consumption and savings optimization-households and firms, the Ramsey model, the Diamond model, Intergenerational issues and simple neo-classical general equilibrium model	7
2	Growth in Dynamic General Equilibrium: Growth theories- assumptions, the dynamics of the model and impacts, Solow model, Speed of Convergence, Role of Human Capital, Empirical Issues; The golden rule of accumulation; Endogenous Growth Theory: AK model; Learning by Doing, Further Extensions	9
3	Real Business Cycles: Concept of economic fluctuations, Real business cycle approach-RBC model, household behavior and the special case of the model, Evaluation and accounting for Business cycle fluctuations, implications	9
4	Micro Foundations in Macroeconomics: Lucas critique, Stagger price adjustments - Caplin-Spulber model, Neo-Keynesian Economics, Coordination failure models, real non-Walrasian theories	8
5	Macroeconomics and Open Economy Aspects: Market for foreign exchange, devaluation and depreciation, real and nominal exchange rate, factors affecting exchange rate, Mundell-Fleming model, fixed versus floating exchange rate, price adjustment, role of fiscal and monetary policies under alternative exchange rate regimes, purchasing power parity concept	9

	Total	42
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11. Suggested Books:

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	David Romer, <i>Advanced Macroeconomics</i> , McGraw Hill, 4 th Edition	2011
2	Ragbendra Jha, <i>Macroeconomics for Developing Countries</i> , Routledge, 2 nd Edition	2003
3	Olivier Blanchard, and David R. Johnson , <i>Macroeconomics</i> , Pearson; 6 th Edition	2012
4	Sala-I-Martin Xavier Barro Robert J., <i>Economic Growth</i> , The MIT Press; 2 nd Edition	2003

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 509** Course Title: **Basic Econometrics**

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

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

4. Relative Weightage: **CWS : 25** **PRS : 0** **MTE : 25** **ETE : 50** **PRE : 0**

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

8. Pre-requisite: Basic knowledge of Mathematics

9. Objective: To provide knowledge of basic econometric tools and techniques useful for economic analysis.

10. Details of Course:

S. No.	Contents	Contact hours
1	Introduction: Nature and meaning of econometrics, structure of economic data, approaches to econometric model building	2
2	Basic Statistical Concepts: Sample and sample space, Random variables and Probability distributions and their properties; Tests of hypothesis; Estimation techniques	8
3	Simple and Multiple Linear Regression Models: Formulation, Estimation and Evaluation-Model with one and k Independent Variables, Assumptions of CLRM, estimation methods (OLS and ML methods), marginal effects, point and interval estimates, Gauss-Markov theorem (BLUE), Test of hypotheses - individual coefficients, testing model parameters	9
4	Functional Forms and Model Specification: Regression models with quadratic effects, log-transformation and non-linear equations; Test of restrictions imposed on the relationship of more parameters-Chow test, Wald test, LR test, Ramsay's RESET, Bera-Jarque test of normality of errors, Hausman specification test	7
5	Violations in CLRM: Heteroskedasticity, Multicollinearity and Autocorrelation-consequences, detection and remedies; specification error, omitted variables, errors in measurement; Aitken theorem and GLS method	10
6	Dummy Variables:	6

	Meaning and Uses of Dummy Variables; Dummy Variable Trap; Interaction effects; Tests for structural stability: The dummy variable approach and Chow test for structural stability	
	Total	42

11. Suggested Books:

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Damodar Gujarati, and Dawn Porter, <i>Basic Econometrics</i> , McGraw Hill, 5 th Edition	2011
2	J.M. Wooldridge, <i>Introductory Econometrics: A Modern Approach</i> , Cengage, 2 nd Edition	2014
3	J.H. Stock and M.W. Watson, <i>Introduction to Econometrics</i> , Addison Wesley, 3 rd Edition	2010
4	J.B. Angrist and J.Pischke, <i>Mostly Harmless Econometrics</i> , Princeton University Press, 1 st Edition	2009
5	William H. Greene, <i>Econometric Analysis</i> , Prentice Hall, 7 th Edition.	2011
6	A. Colin Cameron and Pravin K. Trivedi, <i>Microeconometrics using Stata</i> , Stata Press, 2 nd Edition	2010

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 510** Course Title: **International Economics**

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

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

4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: **Nil**

9. Objective: To develop understanding of international trade theories, strategies and policies in local and global context.

10. Details of Course:

S. No.	Contents	Contact hours
1	An Overview of the World Economy Causes of Trade and Gains From Trade, Trade and Growth, Trade and Environment	3
2	Theories of International Trade I: The Ricardian Model and Comparative Advantage; Factor Endowments and Pattern of Trade and Specialization (The Heckscher-Ohlin Model), Factor Price Equalization	7
3	Theories of International Trade II: New Approaches to Trade Theory, The Distribution of Income and Adjustments, Empirical testing of the Inter-Industry trade and Technological progress in Inter-Industry Trade	8
4	International Trade Policy: The Partial Equilibrium Analysis of Trade Policy, The General Equilibrium Analysis of Trade Policy, Instruments of Trade Policy: Tariffs, Quotas, Most Favoured Nation and Other Policy Instruments	8
5	Strategic Trade Policy: Strategic tariff interaction, Dumping and anti-dumping measures, The theory of Custom Unions, WTO and international trade, GATT, Trade Creation and Trade Diversion	8
6	The Balance of Payments and Determinants of Exchange Rates: Balance of Payments, Determination of Exchange Rate: Purchasing Power Parity, Demand for and Supply of Foreign Exchange and other theories; IMF & International monetary arrangements	8
	Total	42

11. Suggested Books:

S. No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Paul R. Krugman and Maurice Obstfeld, <i>International Economics: Theory and Policy</i> , Pearson Education, 8 th Edition	2008
2	Dominick Salvatore, <i>International Economics: Trade and Finance</i> , Wiley, 10 th Edition	2012
3	Jagdish N. Bhagwati, Arvind Panagariya and T N. Srinivasan, <i>Lectures on International Trade</i> , The MIT Press	1998
4	Bo Sodersten and Geoffrey Reed, <i>International Economics</i> , Palgrave Macmillan, 3 rd Edition	1994
5	Robert C. Feenstra, <i>Advanced International Trade: Theory and Evidence</i> , Princeton University Press, 2 nd Edition	2015

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**

1. Subject Code: **HSN - 511** Course Title: **Environmental Economics**
2. Contact Hours: **L: 3 T: 1 P: 0**
3. Examination Duration (Hrs.): **Theory : 3 Practical : 0**
4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE: 0**
5. Credits: **4** 6.Semester: **Spring** 7. Subject Area: **PCC**
8. Pre-requisite: **Nil**
9. Objective: To enrich the understanding of various issues related to the economy and environment and basic theories of environmental economics with greater emphasis on their application.
10. Details of Course:

S. No.	Particulars	Contact Hours
1.	Introduction: Basic concepts and tools; scope and relevance; difference among environmental economics, ecological economics and natural resource economics; collective choices: Harden thesis of tragedy of commons, Prisoners' dilemma game and Olson concept of collective actions	5
2.	Environment and Development Poverty, environment, and economic growth; Environmental Kuznets Curve and its empirical evidences; Ecosystem services and development; Ecological footprints	7
3.	Efficiency, Market and Market Failure: Concept of efficiency, Pareto optimality, efficiency and competitive markets, efficiency in exchange of goods and bads, consumer and producer surplus; Market Failure: public and private bads, rivalry and excludability, externalities, market and optimum provision of public goods and bads, methods to correct market failure; Pigovian Fees	8
4.	Property Rights: The rights of polluter and the victim, The Coase theorem and its policy significance	4
5.	Environmental Valuation and Cost Benefit Analysis: Environmental values, Consumer demand for environmental goods, welfare effects of a price change, Methods of environmental valuation: revealed and stated preference methods (Hedonic, Household	10

	Production function, travel cost, and Contingent valuation methods); Issues in estimation of costs and benefits, pollution cost, benefits from controlling pollution, efficiency in pollution control, limitations of cost-benefit analysis	
6.	Environmental Regulations and Policy: Rationale for regulations, basic regulatory instruments, issues and effects of environmental regulations; The Kyoto Protocol, CDM and Carbon Credits ; Environmental Regulatory Framework and Environmental Policy in India	8
	Total	42

11. Suggested Books:

Sr. No.	Name of Books/Authors	Year of Publication/ Reprint
1	Charles D. Kolstad, <i>Environmental Economics</i> , Oxford university Press, First Indian Edition, New Delhi.	2006
2	Tom Tietenberg, <i>Environmental and Natural Resource Economics</i> , Addison Wesley Longman, Inc., 7 th Edition	2006
3	Steven C. Hackett, <i>Environmental and Natural Resources Economics: Theory, Policy, and the Sustainable Society</i> , Routledge, 4 th Edition	2010
4	Nick Hanley, <i>Introduction to Environmental Economics</i> , Oxford University Press, 2 nd Edition	2013
5	Daniel W. Bromley, <i>Handbook of Environmental Economics</i> , Blackwell Publishing, 1 st Edition	1995
6	Report of Ministry of Environment and Forests, Government of India, New Delhi	Annual

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT. /CENTRE: **Humanities and Social Sciences**1. Subject Code: **HSN - 512** Course Title: **Advanced Econometrics**

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

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

4. Relative Weightage: **CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0**

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

8. Pre-requisite: Knowledge of Basic Econometric Methods

9. Objective: To provide knowledge of advanced econometric techniques with statistical software applications.

10. Details of Course:

S. No.	Contents	Contact hours
1	Qualitative and Limited Dependent Models: Linear probability model(LPM)- estimation and limitations, Logit and Probit models, Censored and truncated regression, MLE estimation-Tobit model, Applications	7
2	Simultaneous Equation Systems: Structural and reduced form models, simultaneous equation bias, identification problem and estimation methods- 2SLS, 3SLS and LIML; SUR procedure; Problem of Endogeneity- causes and solution; Instrumental Variables estimation; GMM- estimation and testing for overidentification	11
3	Dynamic Econometric Models: Autoregressive and Distributed lag (ADL) relationships- specification and problems in OLS estimation, Koyck's and Almon's approach to DLM, partial adjustment and adaptive expectations method, Exogeneity tests, Wu-Hausman test	8
4	Time Series Analysis: Stationary and non-stationary time series, unit root tests; Concept of cointegration, two-variable model – Engle-Granger method and ECM; system of equations – vector autoregression (VAR), Johansen procedure, VECM, Granger causality	9
5	Analysis of Panel Data: Balanced vs. unbalanced panel, Fixed effects model, random effects model, fixed vs. random effects- Wu Hausman test, dynamic panel model	7
	Total	42

11. Suggested Books:

S.No.	Name of Books/Author/Publisher	Year of Publication/ Reprint
1	Greene, W.H., <i>Econometric Analysis</i> , Pearson, 7 th Edition	2012
2	Verbeek, M., <i>Guide to Modern Econometrics</i> , Wiley, 3 rd Edition	2008
3	A. Colin Cameron and Pravin K. Trivedi, <i>Microeconometrics using Stata</i> , Stata Press, 2 nd Edition	2010
4	Badi H. Baltagi, <i>Econometric analysis of Panel Data</i> , Wiley, 5 th Edition	2013
5	Walter Enders, <i>Applied Econometric Time Series</i> , Wiley, 3 rd Edition	2013