

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**Name of Department/Centre:** Department of Humanities and Social Sciences**Subject Code:** HSC-501**Course Title:** Microeconomics-I**L-T-P:** 3-1-0**Credits:** 04**Subject Area:** PCC

Course Outlines: Theories of consumer behaviour, Technology and production sets, Costs and Production functions, Cost minimization, Profit maximization, Equilibrium in a competitive market, General equilibrium and Pareto optimality, Imperfect competition and market structure-Monopoly, Monopsony and Monopolistic, Game theory with applications to Oligopoly theory, Markets for inputs.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSC-503

Course Title: Macroeconomics-I

L-T-P: 3-1-0

Credits: 04

Subject Area: PCC

Course Outlines: Circular flow of Income, National Income Accounting-concepts and measurements, Inflation, Unemployment, Behavioural and technological functions-Consumption and production functions, Aggregate Demand and Aggregate Supply, The Classical model-Output and Employment, Simple Keynesian Cross Model, IS-LM Model, Keynesian AD-AS Model.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

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

Subject Code: HSC-505

Course Title: Basic Econometrics

L-T-P: 3-0-2

Credits: 04

Subject Area: PCC

Course Outlines : Basic Statistical Concepts, Probability Distributions, Hypothesis Testing, Simple and Multiple Linear Regression Model-Formulation, Estimation and Evaluation, Gauss-Markov Theorem, Regression models with non-linear equations, Heteroskedasticity, Multicollinearity and Autocorrelation, Regression Analysis with Dummy Variables.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSC-507

Course Title: Development Economics

L-T-P: 3-1-0

Credits: 04

Subject Area: PCC

Course Outlines: Evolution of development economics-Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), Indicators of development, Theories in economic development, Strategies of economic development, Poverty and Inequality-Measurements, Issues in developmental growth, Structural adjustment and development, Policymaking and role of institutions in development.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSC-509

Course Title: Mathematical Economics

L-T-P: 3-1-0

Credits: 04

Subject Area: PCC

Course Outlines: Ingredients of mathematical and economic models, Linear models and matrix algebra-Applications to market and national income models, Comparative statics and use of differentiation in economic analysis, Multivariate differential calculus-economic applications, Unconstrained optimization techniques, Constrained optimization techniques, First and higher order differential equations; Simultaneous differential equations-Dynamic Input-output models, Linear programming models, Non-Linear Programming.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSC-502

Course Title: Microeconomics-II

L-T-P: 3-1-0

Credits: 04

Subject Area: PCC

Course Outlines: Advanced topics in decision-making under certainty, Decision-making under risk and uncertainty, Behavioral economics–Prospect theory, Use of games in economics: Static games, Dynamic games, Zero-sum games, Asymmetric information, Adverse selection, General equilibrium analysis, Pure exchange, General equilibrium analysis under uncertainty.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSC-504

Course Title: Macroeconomics-II

L-T-P: 3-1-0

Credits: 04

Subject Area: PCC

Course Outlines: Open economy, International capital flows and trade balance, Mundel-Fleming model under perfect and imperfect capital mobility, Keynesian flexible price model, Resurgence of neoclassicism-monetarism, New classical economics and real business cycle theory, New Keynesian economics and New consensus macroeconomics.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSC-506

Course Title: Public Policy: Theory and Practice

L-T-P: 3-1-0

Credits: 04

Subject Area: PCC

Course Outlines: Evolution of public policy studies, Theories and models of policy making, Policy networks, Public policy cycle, Policy instruments, Policy implementation- Actors and institutions, Policy monitoring and evaluation, Domains of public policy, Policy changes and convergence, Policy making in India.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

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

Subject Code: HSC-511

Course Title: Financial Economics: Theory and Practice

L-T-P: 3-0-2

Credits: 04

Subject Area: PCC

Course Outlines: Expected utility, Risk aversion, Stochastic dominance, Portfolio separation theorems, Discrete time asset valuation, Risk sharing and aggregation, Portfolio performance evaluation, risk-adjusted performance measures, Markowitz mean-variance (M-V) efficient frontier of risky and risk-free asset, Asset Pricing Models, Financial Markets with Imperfections, Stock market theory of Rational Expectations-competitive and non competitive Rational Expectations Equilibrium.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-501

Course Title: Economic and Business Environment

L-T-P: 2-0-0

Credits: 02

Subject Area: SSC

Course Outlines: The Central Concepts of Economics, How Economy Works-Micro and Macroeconomic concepts, Business Cycles and Policy Responses-Fiscal and Monetary Policies, Growth and Development- Technological Change and Innovation, Global Economy-Trade, Tariffs, and Balance of Payment.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-502

Course Title: Sociology of Work

L-T-P: 2-0-0

Credits: 02

Subject Area: SSC

Course Outlines: Context for development of Sociology of work, Theories in Sociology of work, Human relations approach, Fordism and post-fordism, Types of productive systems, Industrialisation and post-industrial society, Recent trends in work and industry, Informal sector, Future of work, Precarity, IT industry in India, Social exclusion in Indian MNCs.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-503

Course Title: Learning and Memory

L-T-P: 2-0-0

Credits: 02

Subject Area: SSC

Course Outlines: Early Philosophical Approaches, Cognitive Psychology, Common Research Methods in Cognition and Learning, Neurological Basis of Learning, Neurotransmission, Behavioural Learning, Operant Conditioning, Strengthening Behavior, Biological Constraints, Avoidance Conditioning, Social Learning, Observational Learning, Imitation, Theories in Learning, Affect and Motivation in Learning, Emotion during Learning, Classical and Modern Motivational Theories, Cognitive Learning, Short-term Memory, Working Memory, Conscious Learning, Forming Memories, Retrieving Memories, Semantic Memory, Forgetting, Retrieval Errors.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-504

Course Title: Advanced Technical Communication Skills

L-T-P: 1-0-2

Credits: 02

Subject Area: SSC

Course Outlines: Introduction to Advanced Technical Communication Skills, Aspects of Effective Communication, Dimensions of technical communication, Non-verbal communication, Barriers to Communication, Forms of Writing in Technical Communication, Structure and Steps in Writing/Drafting Projects/Technical Reports Using Different Style Sheets, Technical Descriptions, Letters, Memos, Minutes of the Meeting, MoUs, Email Etiquette, Writing CV/Resume, Group Discussion Technique, Oral Presentation, Stage Fright, Interview Skills, Meeting Decorum, Negotiation and Persuasion, Communication and AI: Chatbot, Social media in teaching.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HST-501

Course Title: Statistical Application for Behavioral and Social Research

L-T-P: 2-1-0

Credits: 03

Subject Area: STAR

Course Outlines: Descriptive & Inferential Statistics, Measures of central tendency and variability, Standard Scores and the Normal Curve, Statistical Inference and its application, Correlation; Simple Linear Regression, Multiple Regression Analysis, Analysis of Variance, Experimental methods and analysis, Principal component analysis and Exploratory Factor analysis, Confirmatory factor analysis; Use of statistical packages.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT: Department of Humanities and Social Sciences

Subject Code: HSL-901

Course Title: Computational Aspects of ASTADHYAYI

L-T-P: 3-1-0

Credits: 4

Subject Area: Pre-Ph.D.

Course Outlines: Aṣṭādhyāyī an Overview: Māheśvara sūtras, Concept of Anuvṛtti, Adhikāra and Paribhāṣas and its applications, Algorithmic structure in Aṣṭādhyāyī: Primary derivatives and Secondary derivatives, different data structures, Syntax of rules in Aṣṭādhyāyī, concept of BNF and EBNF Grammars, Rule Ordering and selection of rules in Aṣṭādhyāyī and Information coding in Aṣṭādhyāyī.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT: Department of Humanities and Social Sciences

Subject Code: HSL-902 **Course Title:** Computational Linguistics

L-T-P: 3-0-2

Credits: 4

Subject Area: Pre-Ph.D.

Course Outlines: Introduction to Linguistics and Language Processing, Fundamentals of Programming and Tools: Introduction to programming languages like Python, Morphology and Syntax: various morphological models, dependency and constituency parsing, Semantics and Meaning Representation: Word Sense Disambiguation techniques, Text Preprocessing, Statistical NLP, Machine Learning for NLP and Machine Translation- concept of statistical, rule-based models.