Transportation Economics - Theory and Practice (ECO 201)

**Number of Credits:** 4  
**Pattern of Evaluation:** Standard

**Preamble:** In this course, the tools of microeconomic analysis will be applied to the transport sector. We will build on theories and concepts developed in the microeconomics courses and we will show how extensions of the theory can deal with the idiosyncrasies of the transport sector. For example, the concept of “price” is generalized to include the value of time to the traveller. The demand for transporting freight is explained using the theory of the derived demand for an input. At the same time, the impact of modern approaches to management (logistics) would be considered. Just as the concept of “price” requires modification, we will see that “output” has many dimensions and explore the implications of this. In particular, we will examine the cost complexities exhibited in the transport sector and the need to modify pricing principles accordingly. The transport sector is very rich in terms of applications of concepts such as price discrimination and social cost benefit analysis. In addition, a study of transport economics would also involve application of microeconomics in analysis of policies, especially in relation to appropriate ways to regulate firms. The course, in general, covers the relationship between transport and the economy. Basically, the course has been designed to apply economic concepts in a practical setting and illustrate them using case studies especially chosen from the Indian context to provide important insights into the economics and management of different parts of the transport sector.

**Pre-requisites:** The stated prerequisites for the course are: Introduction to Microeconomics and Introduction to Macroeconomics. A reasonable background in basic Algebra and Calculus is needed. Some of the mathematics maybe reviewed in class, if required.

**Module 1: Introduction:** (8 Hours)  
Transport as a catalyst to development; measuring the impact of transport on the economy- case studies of impacts. An overview of transportation activities in India: network and performance; issues for the future. Some basic considerations: transportation and land-use, the transport planning process.

**Module 2: Demand and Supply Analysis:** (12 Hours)  
Transport Demand: The Basic Framework- measuring the demand in a spatial and temporal setting. Traditional Four-Stage Demand Model; modern approaches to modelling demand and practical issues in demand estimation. Supply: the nature of output in transport, output and costs, economies of size, density and scope, empirical estimation of transport cost functions- the approaches and illustrations.

**Module 3: Market Structure and Pricing:** (12 Hours)  
Module 4: Investment Decisions: (8 Hours)
The nature of investment decisions; financial evaluation of transport investments; social cost benefit analysis: economic evaluation of transport investments. Practical issue in evaluation and case studies of road and rail projects evaluation.

Module 5: Market Regulation and Policy: (8 Hours)
Theory of Regulation, Deregulation and Privatisation in Transport. Approaches to privatisation of transport infrastructure and services and a competition policy for transport. Evolution of transport policy in India with focus on case studies regarding different modes.

References:

Essential Readings

Additional Readings
Urban Economics (ECO 202)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This course is designed as a preliminary level course. The learning objective here is to acquaint the underlying theories, propositions and issues that usually arise in studying an urban situation. The course will equip the student with the basic theoretical premises and analytical tools (borrowed from the standard micro and macro economics) that are used by an urban economist. The course therefore is not necessarily grounded in any particular reality (except where explicitly mentioned). However, for pedagogical purposes, explanation and illustrations will naturally come from the Indian situation. It is recommended (although not strictly mandatory) that this course be taken as a pre-requisite for any of the other electives being offered in the area of Urban Economics.

Module 1: Urban Forms: (12 Hours)
Historical evolution of urban forms–definition, rationale and modern related types (UA). Agglomeration – productivity increases, models of optimal city size and regional dispersal. City functions and size class

Module 2: Within the City: (12 Hours)
Location of Economic Activities, Land use patterns – classical models and modern reality, regulation land ceiling and rent control. Labour Markets– nature, informalisation. Migration, Urban poverty, Environment

Module 3: Local Public Goods and Infrastructure: (12 Hours)

Module 4: Governance: (12 Hours)
Municipal governments – sources of revenues (local taxes) and expenditure. Functions and budgets in a decentralized set up. Governance Issues – capacity building and the role of civil society

References:

Essential Readings
3. Bahl, R and J. Linn, Urban Public Finance in Developing Countries, OUP (WB), 1992 (Modules 3, 4)
International Trade: Theory and Policy (ECO 203)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This elective course, to be offered in the third semester, requires a good understanding of Microeconomics. The course aims at providing a theoretical exposition of bases, effects and the restrictions on free flow of international trade with the empirical evidence.

Module 1: Classical Trade Theory: (10 Hours)
Absolute and Comparative Advantage of Trade; Real and Opportunity Cost Approaches; Gains from Trade, Reciprocal Demand and Offer Curves; Terms of Trade. Revealed Comparative Advantage

Module 2: Neo-Classical Trade Theory: (14 Hours)
The Heckscher-Ohlin (H-O) Theory; Factor Price Equalization Theorem and Generalization to n Factors and Goods; Leontief Paradox, Rybczynski Theorem; Trade and Growth

Module 3: Modern Trade Theory: (12 Hours)

Module 4: Trade Policy: (12 Hours).
Instruments of Trade Policy; Tariffs and Welfare, Optimum Tariff, Tariff and Real Rewards to Factors of Production, The Stolper-Samuelson Theorem, Metzler’s Paradox, Theory of Customs Union, Quotas and Export Subsidies. Gains from Trade and Regional Agreements

References:

Essential Readings

Gender Economics (ECO 204)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: This elective integrates a gendered perspective into the process of economic theorizing, the attempt being to enable students to evolve a construct in the context of gendered analysis and alternatives as located in the empirical functioning of the economy. Also examined is the role of women in various economic and also extra-economic spheres, incorporating an evaluation of relevant policies as applicable in different sectors. While cross-country analysis is in-built, the focus is on Indian processes and policies located within an international perspective.

Non-Standard Evaluation Pattern: The evaluation will be done through 40 marks of continuous evaluation and a 60 marks end-semester examination. The 40 marks of evaluation will consist of a mid-term examination of 20 marks (two questions to be attempted over one hour) and a project of 20 marks on Modules 3 and 4. The project topics will be announced by the 4th teaching week of the semester and the projects should be in by the 10th teaching week. All modules will carry equal weight for the three hour end-semester examination.

Module 1: Introduction to Gender Economics: (12 Hours)
Exploitation versus oppression – Access and control over economic resources – Patriarchy and development – Approaches to developmental theories – Contribution of women to national income and economies – Indicators of development – Gender Development Index and Gender Empowerment Measure – Visibility of women and biases inherent in data systems – Limitations of National Income statistics

Module 2: Conceptualisation of Work and Employment: (14 Hours)

Module 3: Demographic, Nutrition and Health Profile: (10 Hours)
Demographic structures in developed and developing economies – Differentials in sex-ratio, mortality, morbidity, and life-expectancy – Economic determinants of population policies – Intra-household inequalities of access to health and nutrition – Energy expenditure and nutritional deficiency – Food security – Efficiency and equity of health delivery systems

Module 4: Women in the Developmental Process: (12 Hours)
Plan approaches to gender issues – Methods and critique of gender budget analysis – Strategies, policies and programmes for poverty alleviation and economic empowerment – Micro-finance, Self-Help Groups, etc. – Gendering macroeconomic perspectives, approaches and methodologies – Fiscal and monetary policies – Issues of trade, investment and subsidies in the international and national context
References:

Essential Readings

2. Barker, Drucilla and E. Kuiper (eds), Towards a Feminist Philosophy of Economics, Routledge, 2004
6. Kabeer, Naila, Reversed Realities: Gender Hierarchies in Development Thought, Kali, New Delhi, 1994
8. Kuiper, E., et.al. (eds), Out of the Margin, Routledge, 1998
Economics of Human Development (ECO 205)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: This course on the Economics of Human Development focuses on the widely-accepted global perspective of viewing development as the expansion of people's capabilities, capacities and choices. This people-centric analytical framework for designing and assessing public policy interventions has several implications at macro, meso and micro levels both nationally as well as internationally. This elective has a relatively strong applied component specifically in relation to India that is in-built into each module.

Non-Standard Evaluation Pattern: The evaluation be done through 40 marks of continuous evaluation and a 60 marks end-semester examination. The 40 marks evaluation will consist of a mid-term examination of 20 marks (two questions to be attempted over one hour) and a project of 20 marks on Modules 3 and 4. The project topics will be announced by the 4\textsuperscript{th} teaching week of the semester and the projects should be in by the 10\textsuperscript{th} teaching week. All modules will carry equal weight for the three hour end-semester examination.

Module 1: Concepts of Human Development: (12 Hours)

Module 2: Dimensions of Human Development: (12 Hours)
Empowerment, equity, sustainability, security, productivity and participation – Role of freedoms in promoting human development -- Multi-dimensionality of poverty – Concept of inclusive growth – Role of civil society, NGOs, and people’s organizations – Obstacles to inclusive growth – Impact of globalization

Module 3: Measurement: (12 Hours)
Need for indices - GDP – Physical Quality of Life Index (PQLI), Disability Adjusted Life Years (DALY), Social Capability index – Human Development Index – Human Poverty Index – Gender Related Development Index – Gender Empowerment Measure

Module 4: Aspects of Human Development: (12 Hours)
References:

Essential Readings

1. Chelliah Raja J and R. Sudarshan (ed), Income Poverty and Beyond: Human Development In India, UNDP, Social Science Press, New Delhi, 1999
8. International Labour Organization: World Employment Reports
10. Sen Amartya, Development as Freedom, Oxford University Press, New Delhi, 1999
Theory & Practice of Regional Trading and Monetary Arrangements  
(ECO 206)

Number of Credits: 4  
Pattern of Evaluation: Standard/Non-Standard

Preamble: Regional/ preferential trading arrangements are increasingly becoming important. The course aims at studying in detail the theory underlying and the issues related to both regional trading and regional monetary arrangements. The course purports to apply econometric techniques in the form of gravity models to the study of regional arrangements. The pedagogy in the first two modules will rely on detailed study of selected chapters from the first two indicated references. Two real-world regional arrangements will be examined in detail in the last module, which may be tested, as a part of internal continuous evaluation, through a project on RTA/RCA.  
Non-Standard Evaluation Pattern: The evaluation be done through 40 marks of continuous evaluation and a 60 marks end-semester examination. The 40 marks evaluation will consist of a mid-term examination of 20 marks (two questions to be attempted over one hour) and a project of 20 marks on Modules 3 and 4. The project topics will be announced by the 4th teaching week of the semester and the projects should be in by the 10th teaching week. All modules will carry equal weight for the three hour end-semester examination.

Module 1: Customs Union Theory: (16 Hours)  
Levels of economic integration – trade creation and trade diversion - economies of scale and customs union – intra-industry trade and customs union – customs union and terms of trade - customs union and welfare – dynamic aspects of customs union

Module 2: Theory of Currency Areas: (8 Hours)  
Currency areas – optimum currency areas – contributions of Mundell, McKinnon and developments thereof

Module 3: Applications of Econometric Methods in RTA analysis with special reference to Gravity Models: (12 Hours)  
The concept of gravity in economic analysis – theoretical underpinnings of gravity models – some applications of gravity models in regional trading and monetary analysis

Module 4: Contemporary Regional Trading and Monetary Arrangements: (12 Hours)  
Regionalism and multilateralism in the context of WTO – Overview of regional trading arrangements in Asia - Any two of the following, as chosen by the course instructor, to be studied in details: SAARC and SAFTA, ASEAN & AFTA, European Union, NAFTA, regional trading arrangements in Africa, Africa-EU trade

References:

Essential Readings

Statistical Foundations of Econometrics (ECO 207)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: This course aims to familiarize students with elements of probability and inferential statistics that form the basis of modern econometrics. This course is a bridge between what is taught in the core paper and more advanced treatments of the subject.

Evaluation Pattern: Four examinations of ten marks each, to be held after the completion of each module, followed by an end semester examination of sixty marks.

Module 1: Axiomatic Approaches to Probability: (8 Hours)
Sample spaces, sigma fields and probability measure- Probability Axioms and their Implications- Counting methods- Conditional probability, independence and exchangeability-Bayes’ Theorem and its Applications

Module 2: Random Variables and Probability Distributions: (16 Hours)
The concept of a random variable- joint, marginal and conditional distributions-Moment generating function and cumulants- Independent random variables- Some discrete and continuous random variables (normal, t, chi square and F distributions mandatory)- Functions of random variables

Module 3: Introduction to Statistical Inference: (16 Hours)
Modes of Convergence- Weak and strong law of large numbers – Central limit theorem with proof- Properties of estimators- Different Estimation methods and the properties of the associated estimators ( Multiple OLS estimators mandatory)

Module 4: Hypothesis Testing Theory: (8 Hours)

References:

Essential Readings
Economics of Agricultural Production and Rural Markets (ECO 208)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This course would helpful to understand the various types of relationships in agriculture: factors and products, problems of instability in production, the functioning of and imperfections in credit markets, labour markets, and land markets.

Module 1: Economics of Agricultural Production, Resource Use and Instability in Agriculture: (12 Hours)
Resource and input use – Important production relationships – Economics of input and product substitution – Imperfections in product and input markets in developing agriculture – Sources of price variability and income instability – Rationale for and types of government intervention for price support and reduction in instability – Alternative concepts of cost of cultivation and determination of minimum support prices in India – Role and optimum size of buffer stocks

Module 2: Rural Credit Markets: (12 Hours)
Characteristics of rural credit markets, credit fragmentation – Organized and unorganized sectors – Theories of informal credit markets: Lender’s Risk Hypothesis, Default and collateral, Credit rationing: Default, Informational asymmetries – Moral hazard – Evolution of credit systems in India – Role and Performance of Commercial Banks, Co-operative Credit Institutions, Regional Rural Banks, NABARD and Micro-credit through SHGs in India, imperfections in rural credit markets in India

Module 3: Labour Markets: (12 Hours)

Module 4: Land and Lease Markets: (12 Hours)

References:

Essential Readings

5. Ray Debraj, Development Economics, Oxford University Press, Oxford, 2004 (Module 2)
7. Bardhan P.K, Land, Labour and Rural Poverty, Oxford University Press, New Delhi, 1984 (Module 3, 4)
8. Kapila Uma, Understanding the Problems of the Indian Economy, (Sixth Edition) Academic Foundation, New Delhi, 2005 (Modules 2, 3, 4)
**Economics of Labour Markets** (ECO 209)

**Number of Credits:** 4  
**Pattern of Evaluation:** Standard

**Preamble:** Labour market issues are important for students of Micro, Macro, and Industrial Economics. The course sheds light on a range of new developments and a host of issues studied by generations of labour market experts. It captures the interplay of various factors in the labour market by describing demand/supply aspects, wages, employment, unemployment, the cost of labour, workers’ participation and impact of new labour policies in the labour market. The course will be offered in the third semester.

**Module 1: Nature of the Labour Market:** (8 Hours)  
Concept of labour market, Characteristics, Types, Search in labour markets, The theory of Human Capital, Investment in Human Capital, Costs and life-time benefits to education

**Module 2: Micro and Macro Approaches in Labour Markets:** (16 Hours)  

**Module 3: Wage Issues in Labour Markets:** (12 Hours)  
Theories of Wages, Wages in different markets, Wage structure and components of wages, Share of wages, Distribution and Inequality of wage income, Male-female wage differentials, Inter-Sectoral wage differentials, Contract labour, Properties of contractual wages, Labour market rigidities and flexibilities, Wage and output relations in India during pre- and post-reform period

**Module 4: Labour Markets in India:** (12 Hours)  
Linkages in labour markets, role of risk, Information and incentives, Dualism and segmentation, Labour market flexibility, Employee turnover, Migrant labour, State and labour markets, Impact of trade unions on productivity and wages, Minimum wages, Social security, Occupational safety and security, Wages and incomes policy in India, Impact of liberalization and globalisation
References:

Essential Readings

2. Bhagoliwal T.N., Economics of Labour and Industrial Relations, Sahitya Bhawan, Agra, 1985
5. Harris-White Barbara and Sinha Anushree, Trade Liberation and India’s Informal Economy, Oxford University Press, New Delhi, 2007
8. Uchikawa Shuji (eds.), Labour Market and Institutions in India 1990s and Beyond, Manohar Publishers, New Delhi, 2003
**Financial Economics** (ECO 210)

Number of Credits: 4  
Pattern of Evaluation: Standard

**Preamble:** The objective of the course is to introduce students over 48 lectures to the major topics in the subject such as mean-variance portfolio theory, the capital asset pricing model, efficient markets hypothesis, pricing of bonds as also to different systems of financial markets.

**Module 1: Capital Asset Pricing Model:** (12 Hours)  

**Module 2: Valuation Models and Bubbles:** (12 Hours)  

**Module 3: Bond Markets:** (12 Hours)  

**Module 4: Systems of Financial Markets:** (12 Hours)  

**References:**

Theory of Monetary Institutions (ECO 211)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: The course is 1. constructive, that is, will exploit the open foundations of the subject to work through alternative monetary arrangements using microeconomics, and 2. relevant, in that it connects with abiding discussions on the nature of money, the role of banks, the appraisal of central banks, a world central bank, and so on.

Module 1: One-period Trade: (12 Hours)
Market mechanisms: The “bid-offer” market, many monies, gold and paper money: The loan market, the money rate of interest, a fractional reserve system: modelling trust, Fiat money: modelling bankruptcy, Incomplete markets: commodity money and other structures, money and liquidity: the store of value function

Module 2: Multiperiod Trade: (12 Hours)
Commodity money and credit: “badly distributed “money and credit, fiat money and credit: strategic market games with/without lending, Transactions and the float: financing the float, capital stock, salvage values, Expectations: strategic market games with uncertainty, Money and Transactions Costs: endogenous money, the combinatorics of exchange, brokers and dealers: middlemen, clearinghouses, and setup costs

Module 3: Banking Arrangements: (12 Hours)
An “ideal banking system”: a modern loanable funds theory, the bank’s portfolio problem equilibrium: from the corn economy to the monetary economy, towards a general equilibrium theory of credit
Narrow Banking: “Deposit Creating Institutions”, Free Banking, Universal Banking

Module 4: Central Banks: (12 Hours)
Open-market operations: incentive-compatible contracts, The Lender of Last Resort function: moral hazard, Monetary policy with informal financial markets: dual economy dynamics, Monetary-Fiscal Coordination, Managing Aggregate Risk: systemic fragility and policy, A World Central Bank: The IMF?

References:

Essential Readings

Preamble: This course takes a critical look at the currently fashionable ‘decentralization’ and ‘governance’ in the context of the passage of 74th Constitutional Amendment. Municipal governments form the third tier of governance. There are a whole lot of functions that have been assigned to the local governments. There are however some issues that arise in this context. One of the main ones that the student will be expected to study in this course will be the state of finances of the local bodies. The related issue of level of autonomy for sub-national governments within a federal set up will also be discussed. The budgets of select municipal bodies will be discussed in detail from the perspective of – and using economic categories – an economist. The devolution from higher governments and the role of state finance commissions in this context will also be touched upon. The role of civil society, especially in the context of participatory democracy and empowerment of people, will also be studied.

Module 1: (12 Hours)
The municipal ‘acts’ – the obligatory and discretionary functions – the tax and non-tax revenues – the profile of ULBs in Maharashtra The state of municipal finance in Maharashtra – Budgets – Charters

Module 2: (12 Hours)

References:

Essential Readings

1. Primary (original) Sources: 74th CA; Budget Documents of MCGM, Maharashtra State Finance Commission Reports, AIILSG Reports (Module I)
2. Bahl, R and J. Linn, Urban Public Finance in Developing Countries, OUP ,1992 (Module I, II)

Additional Readings

1. Working papers of the Vibhooti Shukla Unit
International Finance (ECO 213)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This elective course, to be offered in the fourth semester, requires a good understanding of Macroeconomics. This course aims at providing a theoretical exposition of different aspects of international finance and financial institutions in the context of globalization. A good understanding of International Trade and Trade Policies is desirable.

Module 1: Foreign Exchange Rates and Markets: (12 Hours)

Module 2: Balance of Payments: (12 Hours)

Module 3: International Investment and Financing: (12 Hours)

Module 4: International Financial Institutions: (12 Hours)
References:

Essential Readings

3. Levi Maurice D., International Finance, Routledge, New York, 2005 Chapters: 2, 3, 4, And 9 to 18 (Modules 1, 2 and 3)
**Time Series Econometrics** (ECO 214)

**Number of Credits:** 4  
**Pattern of Evaluation:** Standard

**Preamble:** The course aims at building on the Basic Econometrics course to equip the students with econometric techniques of time series analysis. Though the approach will largely be applied, some derivations of theoretical results will be emphasized. Applications to financial econometrics at the level of Chris Brooks’ Introductory Econometrics for Finance will be emphasized.

**Module 1: Introduction and Single Equation ARIMA Models:** (16 Hours)  
Difference equations and lag operators, Data generating process, Characteristic equations, Ergodicity and Stationarity, Autocorrelation and Partial autocorrelation functions, Stationary ARMA processes, Invertibility, Box-Jenkins Approach to identification, estimation and diagnostic checking, Time series analysis in the frequency domain, Uses of spectral analysis.

**Module 2: Modeling Volatility and Trends:** (8 Hours)  
ARCH and GARCH processes, Deterministic and Stochastic trends, Dickey-Fuller tests and extensions including testing for structural change.

**Module 3: Multi-equation Time Series Models:** (12 Hours)  
Transfer Function Models, Intervention analysis, VAR models, Impulse-response functions and forecast error variance decomposition, Cholesky and Blanchard-Quah decompositions, Structural VAR models.

**Module 4: Co integration and Error-Correction Models:** (12 Hours)  

**References:**

**Essential Readings**

Public Choice: Theory and Applications (ECO 215)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: The objective of the course is to provide an introduction to Public Choice theory. Public Choice is a relatively young sub-discipline of economics, having developed as a separate field largely since 1948. Public Choice can be defined as the application of economics to political science. The subject matter is that of political science and the methodology is that of economics. In this course the students will be introduced to various issues in a direct and representative democracy framework. Various policy matters too will be discussed in the Public Choice framework. Students would also analyze policy issues in a politico-economic framework via projects.

Module 1: Toolkit for Analysis & Basic Issues: (12 Hours)

Module 2: Public Choice in a Direct Democracy & Representative Democracy: (12 Hours)

Module 3: Conflicting Interests: (12 Hours)

Module 4: Policy Issues: (12 Hours)

References:

Essential Readings
1. Mueller D., Public Choice III, Cambridge University Press, 2003 (Modules 1, 2, 3, 4)
2. Drazen A., Political Economy in Macroeconomics, Princeton University Press, 2000 (Modules 1, 3)
Data Envelopment Analysis (ECO 216)

Number of Credits: 2
Pattern of Evaluation: Standard

Preamble: The course is useful in measuring the performances of similar units. It identifies the extent of inefficiency, the causes for this inefficiency through the wastage of resources and also suggests the extent to which the performance can be improved.

Module 1: Basic Concepts of Data Envelopment Analysis (DEA): (4 Hours)
A Decision-Making Unit; Measurement of Efficiency; Frontier Analysis; illustrative exercises

Module 2: Mathematical Programming Aspects of DEA: (8 Hours)
Linear Programming; primal & dual; fractional DEA programme; output- maximization and input-minimization DEA models; illustrative exercises

Module 3: Economies of Scale: (4 Hours)
Variable and Constant Returns to Scale and DEA, Technical and scale efficiencies, Computer applications using industry data

Module 4: Extensions in DEA: (8 Hours)
Malmquist Productivity Index, Use of Regressions and sensitivity analysis in DEA. Practical applications using sectoral data

References:

Essential Readings

1. Ramanathan R, An Introduction to Data Envelopment Analysis A tool for performance measurement, Sage Publications New Delhi, 2003 (all Modules)
**Input Output Theory and Applications** *(ECO 217)*

**Number of Credits:** 4  
**Pattern of Evaluation:** Non Standard

**Preamble:** The elective is useful for both structural analysis and policy guidance in an economy. It helps in revealing the quantitative significance of various types of interdependence. This course will provide hands on computer for applications and analysis.

**Evaluation Pattern:** The evaluation will be done through 40 marks of continuous evaluation and a 60 marks end-semester examination. The 40 marks of evaluation will consist of a mid-term examination of 20 marks (two questions to be attempted over one hour) and a project of 20 marks on Modules 3 and 4. The project topics will be announced by the 4th teaching week of the semester and the projects should be in by the 10th teaching week. All modules will carry equal weight for the three hour end-semester examination.

**Module 1: Input Output Model:** (16 Hours)  
*Static Input Output Models* - Definition, Formulation, Scope, technical coefficients, balance equations, economic interpretations, direct and indirect effects, the capital coefficient matrix.  
*Multiplier and Linkage analysis* - Output and Income multipliers, backward and forward linkages, total linkage effect, interpretation of linkages, practical applications. Extended multiplier analysis: employment effects, distribution of income.

**Module 2: Dynamic Analysis:** (8 Hours)  
*Dynamic Input Output analysis:* Dynamic Input output Models, model for planning, projection of economic growth, measurement of economic development and growth potential, use of shadow prices in a developing economy. An Introduction to basics of CGE models and SAM

**Module 3: Structural Analysis:** (12 Hours)  
*Trade Strategies:* Import substitution, intensity, measurement, impact. Pattern of international trade, determinants, comparative advantage, the semi-input output method, programming approach.

**Module 4: Regional Input Output Analysis:** (12 Hours)  
*Regional Models:* Single region models and multi region models, Regional Coefficients-Non-survey and partial survey methods- the RAS technique, Location quotients and related techniques

**References:**

**Essential Readings**

1. Bulmer-Thomas V (1982) *Input Output Analysis in Developing Countries Sources, Methods and Applications*, John Wiley & Sons Ltd, New York (Modules 1, 2, 3, 4)
Demography: Theory and Basic Analysis (ECO 218)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: The course is designed to provide an understanding of demographic processes including an in-depth knowledge of linkages between population and economic development. It introduces major developments in demographic concepts by highlighting the sources of demographic data, fertility, mortality, migration and population projection.

Module 1: Population Science, Demography and Economic Development: (10 Hours)

Module 2: Nuptiality and Fertility: (14 Hours)
Basic concepts of Nuptiality, Analysis of Marital Status Data, Singulate Mean Age at Marriage: Synthetic Cohort and Decadal Synthetic Cohort Method, Concepts and measurements of Cohort and period fertility, Rele’s Method and Reverse survival method in fertility analysis, Bongaart’s Proximate Determinants of Fertility, Socio-Economic Determinants of Proximate Variables, Indirect Estimation of Fertility Rates, Davis’s Intermediate Variables framework of Fertility, Age Patterns of Fertility.

Module 3: Mortality: (12 Hours)

Module 4: Migration and Population Projections: (12 Hours)
Concepts, Patterns and Measures of Migration, Migration Theories and Models (Ravenstein’s, Lee’s, Wolpert’s and Todaro’s model), Internal and International Migration, Spatial Distribution and Urbanisation, Importance of Population Projection, Methods of Population projection: Mathematical and components methods.

References:

Essential Readings

7. International Institute for Population Sciences (IIPS), Reproductive and Child Health Survey, Mumbai, 2002-04
10. Mitra RG, Understanding patterns of Migration from Census 2001 Data, Population, 2002
11. Stabilisation and Development, Council of Cultural Growth and Cultural Relations, Cuttack
Trade Unions and Industrial Relations in India (ECO 219)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This course attempts to provide a basic conceptual understanding of the economics of trade unions and industrial relations in India. The syllabus also includes the empirical relevance of theories with suitable examples from a practical industrial relations viewpoint. Such an attempt will be strengthened to enable familiarity with relevant data along with their limitations.

Module 1: Economics of Trade Unions: (9 Hours)

Module 2: Industrial Relations: (12 Hours)
Definition and scope of industrial relations, Approaches to Industrial Relations: Macro Approaches-System Approach and Class Conflict Approach, Micro Approaches-Taylorism, Fordism and Post-Fordism, Neo-Fordism, Pluralism, Human Relations School and Organisational Behaviour Approach.

Module 3: Industrial Relations in India: (15 Hours)

Module 4: Role of the State in Industrial Relations in India: (12 Hours)

References:

Essential Readings
Financial Derivatives (ECO 220)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: This is a one-semester course to be taught over 48 lectures with the objective to acquaint students with the concepts and analytics of financial derivative securities, the different derivative instruments and the pricing of derivative securities.

Module 1: Introduction to Basic Concepts: (8 Hours)  

Module 2: Forwards, Futures and Options: (16 Hours)  
Basic Concepts - Purpose of Futures Markets (price discovery and hedging) - Types of Traders and Orders in Futures Markets -Forward Rate Agreements (FRAs) - Option Positions, Margins, Bid-Ask Spread, Writing Options, Warrants and Convertibles, Exotic Options, Put-Call Parity - Straddles and Strangles, Spreads.

Module 3: Pricing of Derivative Securities: (12 Hours)  
Determination of Forward and Futures Prices, Characteristics of Futures Prices, Futures Prices and Expectations, Hedging Strategies using Futures - Black-Scholes Model, Alternatives to Black-Scholes, the Greeks, Speculating and Hedging with Options - Bond Options and Pricing of Contingent Claims.

Module 4: Swaps: (12 Hours)  
Comparative Advantage Principle, Swap Facilitators (Brokers and Dealers), Interest Rate and Currency Swaps and their Valuation, Other Swaps (Equity Swaps, Commodity Swaps).

References:

Essential Readings


Additional Readings

Open-Economy Macroeconomics (ECO 221)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: The course deals largely with the relatively more recent developments in the field of international finance through a macroeconomic model-based approach. It begins though, in Module 1, with the more traditional open-economy models, as a backdrop to the subsequent analysis. The emphasis throughout is on rigour including the application of inter-temporal general equilibrium models based on utility/profit maximization in Units 2 to 4. This will be combined with approaches that yield insights into models that, though rigorous, are not micro-founded. The teaching will rely largely on the use of Obstfeld and Rogoff (1999) supplemented by Rodseth (2000).

Module 1: Traditional Open-Economy Models: (12 Hours)  
Open-economy monetary models with minimal structure, Mundell-Fleming-Dornbusch and Mundell-Fleming-Tobin models, Models with traded and non-traded goods, Scandinavian model of inflation.

Module 2: The Basic Inter-temporal Approach to BOP Analysis: (12 Hours)  
Basic ideas in a two-period endowment economy and a two-region world economy, Extension to a multi-period small economy, stochastic current account model, Government budget deficits and the current account, Feldstein-Horioka S-I puzzle.

Module 3: Stochastic Models of International Capital Flows and Asset Prices: (12 Hours)  
Trade across random states of nature in a small two-period open economy, Generalization of the model to the world setting, International portfolio diversification, CAPM, Sovereign risk.

Module 4: Money and Exchange Rate Regimes: (12 Hours)  
Monetary exchange rate models with maximizing individuals, Nominal exchange rate regimes, Speculative attacks and fixed exchange rate regimes, Target zones for exchange rates, Stochastic global general equilibrium model with nominal assets, Determination of forward foreign exchange premium.

References:

Essential Readings

Rural Political Economy (ECO 222)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: The objective of this elective is to familiarise students with rural theories and realities in the specific context of the emergence of new forces and issues both nationally and internationally, and the evolution of strategies and policies to deal with them.

Module 1: Agriculture, Allied, and Rural Economics: (12 Hours)
Definitions of and differences between agricultural, allied and rural sectors – Approaches to rural economics – Historical role of the rural sector in economic development – Impact of colonisation on agrarian development – Indigenous Peoples – Natural resources – Case study of India

Module 2: Market Structures: (12 Hours)

Module 3: National Processes and Globalisation: (12 Hours)
Role of public policies – Private sector versus government intervention – Public-Private policy partnership – Formation of BWI’s and WTO – Dunkel Draft, GATS, AOA, etc – Impact on imports and exports of developed and underdeveloped countries.

Module 4: Country Assessment Studies: (12 Hours)
Japan, China, Netherlands, Israel, Uzbekistan, Brazil, Mexico, USA, Australia, New Zealand, South Africa, India, Pakistan.
References:

Essential Readings

1. Acharya S.S. and D.P. Chaudhari (eds), Indian Agricultural Policy – At the Crossroads, Rawat Publications, Jaipur, 2001
10. Rosset Peter, Raj Patel, and Michael Courville (eds), Promised Land: Competing Visions of Agrarian Reform, Foodfirst, California, USA, 2006
Industrial Economics (ECO 223)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This elective course, to be offered in the third semester, requires a good understanding of both Microeconomics and Macroeconomics. This course aims at providing a theoretical exposition of the behaviour of the firm, market structure and industrial finance with some issues and relevant empirical evidence of Indian industries.

Module 1: Theory of the Firm: (14 Hours)

Module 2: Technical Change: (10 Hours)

Module 3: Financial Analysis: (14 Hours)

Module 4: Indian Industry: (10 Hours)
References:

Essential Readings

1. Ahluwalia I. J., Industrial Growth in India- Stagnation since the mid-sixties, Oxford University Press, Delhi, 1985 (Module 4)
3. Koutsoyiannis A., Modern Microeconomics, ELBS/Macmillan, Hong Kong, 1985 (Module 1)
Agricultural Development and Policy (ECO 224)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: This course aims to enhance the students’ understanding of agricultural development. Starting from basic questions like what factors lead to agricultural development or why does the share of agriculture in GDP go down once economies start developing, the course tries to enhance the students’ awareness on contemporary debates in the literature, and leads them to analysis of current governmental policies and strategies for surviving in the globalizing world.

Module 1: Theories of Agricultural Development: (12 Hours)  
Role of agriculture in a developing economy vis-à-vis a developed economy; Theories of agricultural development (Lewis, Schultz, Mellor, Hayami and Ruttan)

Module 2: Sustainable Agricultural Development and Food Security: (12 Hours)  
Impact of green revolution; Models of spread of technology and experiences in input use efficiency; Measurement and strategies for sustainable development; Food security: Concept, measurement, magnitude, and critical evaluation of government policies

Module 3: Competitiveness of Agriculture Products and Marketing: (12 Hours)  
Measurement of efficiency of agricultural products in international markets; Efficiency of agricultural markets in India; Form and impact of government intervention in the markets and its effects on efficiency; Commodity markets: operation and likely impacts; Strategies for surviving in a globalizing world

Module 4: History and Policies for Agricultural Development in India: (12 Hours)  
Trends in production since 1950; National Food Policy; Agriculture Policy; Area, productivity, employment and wage rate analysis; Trends in India’s agricultural exports and imports and implications

References:

Essential Readings

3. Dreze Jean and Amartya Sen, Hunger and Public Action, Oxford University Press, 1989 (Module 2)
4. Lewis Arthur, Economic Development with Unlimited supply of labour, Manchester School of Economics and Social Studies 22: 139-91, 1954 (Module 1)
7. Sawant S D (2002), Indian Agriculture: Past developments and policies for the future, Dantwala Monograph Series, No. 4, 2002 (Module 4)
8. Schultz Theodore, Transforming Traditional Agriculture, Yale University Press, 1964 (Module 1)
10. Shiva Vandana, The Violence of the Green Revolution, Palgrave Macmillan, 1992 (Module 2)
Political Economy of Reform (ECO 225)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: This course analyses the role of political institutions in shaping reform outcomes. It highlights key political challenges to economic reform. What distinguishes this course from a traditional course in political science is the application of analytical rigor to economic and political behaviour. Reforms are viewed as the establishment of institutions that provide incentives for individual decision makers to behave in ways that are collectively desirable. Politico-economic modelling would sharpen our understanding of the process of policy making. The Indian experience of reforms and the various political economy issues are given special attention.

Module 1: The Political Economy of Reform: (12 Hours)  
Political Economy of Democratic Transitions: The theoretical orientation, general concepts and arguments.  
Economic Policy and Political Stability: Authoritarian Regimes and New Democracies  

Module 2: Inaction and Delay in Reform & Strategies for Reform: (12 Hours)  

Module 3: The Transition Experience: Macroeconomic Assessment & Lessons:  
(12 Hours)  
From Plan to Market: Understanding transition, the challenge of transition, the challenge of consolidation  
Broad Lessons from Transition Experience based on experience of select countries.

Module 4: Democratic Politics and Economic Reforms in India: (12 Hours)  
Political Skills: Introducing Reforms by Stealth

References:

Essential Readings

5. World Development Report, From Plan To Market, World Bank, 1996 (Module 3)
Urban Infrastructure Finance (ECO 226)

Number of Credits: 2
Pattern of Evaluation: Standard

Preamble: It is well recognized that infrastructure in general and urban infrastructure in particular poses several challenges. The course is designed to acquaint the students with the current state of affairs in the Indian context. The existing gap in the demand and supply of infrastructure has to be addressed in various ways. The students will learn the standard financing methods as well as variants in the realm of PPP. Some novel emerging ideas and practices such as SDOs and Pooled Fund approaches will also be treated.

Module 1: Concept, Status and Delivery Mechanisms: (12 Hours)
Concept of Infrastructure – physical/social and soft – Provision of infrastructure by local bodies – Para-statals – Core/obligatory services – LPGs and extended version and actual status in urban India with specific reference to Maharashtra

Module 2: Financing Infrastructure: (12 Hours)
Financing infrastructure: the capacity of local bodies – user prices. Alternative methods – Bonds, Banks, Structured Debt Obligations (SDOs), Pooled funding, Revolving Fund – Case studies in India and abroad – Tamil Nadu Urban Development Fund (TNUDF)

References:

Essential Readings
1. India Infrastructure Reports (Chapters related to Urban Infrastructure)

Additional Readings

Working papers of the Vibhooti Shukla Unit
Regional Economics Theory and Methods (ECO 227)

Number of Credits: 4
Pattern of Evaluation: Non Standard

Preamble: The course would provide basic understanding of the main concepts, issues, problems and techniques in regional planning. Interregional trade will be dealt with in the contexts of regions within a nation. It would help in understanding and analyzing regional growth disparities in India.

Module 1: Regional Growth: (16 Hours)
Meaning of regional growth, Growth theories: the neo-classical perspective, export demand models, agglomeration and cumulative growth process. Inter-regional Trade: Regional trade specialization: the Ricardian explanation, the factor proportion explanation, Modern theories of regional trade: Intra-industry trade, competitive advantage and regional trade, new economic models of trade.

Module 2: Regional Migration: (8 Hours)
Factor Migration: the classical theory of labour migration, Alternatives: the human capital model, the job search model, the gravity model. Disparities in Regional Unemployment

Module 3: Regional Policy: (8 Hours)
Macro policy Instruments: Fiscal policy, regional aspects of taxation and government expenditure, monetary policy, import control, devolution and regional policy. Micro Policy Instruments: Reallocation of labour, capital

Module 4: Evaluation of Regional Policy: (16 Hours)
Measuring regional disparities, regional development indices, use of composite index, econometric models, regional input output multipliers, principal component analysis, DEA etc. – case studies

References:

Essential Readings

Quantitative Methods in Demography (ECO 228)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This four credit course, to be offered in the third or fourth semester, requires good understanding in Statistics/Econometrics. The course aims at enabling students to pursue further research in applied Demography.

Module 1: Advanced Research Methodology: (10 Hours)
Concepts in Research methods, Quantitative and Qualitative approaches in data collection, Reliability and Validity of measurement, Types of scales, Sampling frame and design. Sampling methods, Multistage sampling in Large scale surveys. Sampling and Non-sampling errors, Sample size determination.

Module 2: Quantitative Methods in Data Analysis: (14 Hours)
Path models with interactions and non-linearity, Analysis of variance, Multiple Classification Analysis, Factor analysis and Principal Components Analysis, Binary Logistic regression. Multinomial logit regression: Basic form of logit model, interpretation of coefficients. Discriminant analysis, Multilevel analysis and application.

Module 3: Modelling in Demography: (14 Hours)

Module 4: Indirect Methods: (10 Hours)

References:

Essential Readings

Economics of Health and Education (ECO 230)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: This elective course covers theoretical foundations of economics of health and education and also techniques of economic evaluation. These two aspects of social infrastructure are clubbed together because there is an interdependence of output and existence of large externalities in both health and education sectors. Also these are important components having critical linkages to human development through improving human capabilities and empowerment. This course aims to equip students with skills to understand and analyze the development of the health and education sectors. The emphasis will be on policy options and issues for developing countries like India but will also draw on the experience of other countries wherever relevant.

Module 1: Economics of Health: (12 Hours)

Module 2: Financing Health Care, Delivery of Health Care: (12 Hours)
The economics of financing health care, different approaches taken by governments in different countries- Options for financing health care in developing countries- The rationale of government funding and regulation of health care- examining the potential role of user charges and community financing schemes. Delivery of health care -decentralization and the role of the private/public mix.-health system reforms. The future of Health Sector reforms in developing countries like India

Module 3: Economics of Education: (12 Hours)
Formal and non-formal education-Special characteristics of education- Implications for economic analysis- Role of the state – Education, Productivity and Employment-Investment in education: Costs and benefits, Private and social rates of return (Human capital and Signaling theories of education)

Module 4: Indian Education System: (12 Hours)
Indian Education system –Rationale of government funding and regulation of education- Alternative method of financing education- Resource allocation to primary, secondary and higher education- Efficiency, equity and distributional aspects: Implications for gender and social groups- Role of private and public sectors, Union and State governments- Special programmes for education.
References:

Essential Readings

3. Feldstein, P. J., Health Care Economics, Wiley, 1993 (Module 1)
5. Henderson, J.W, Health Economics and Policy, South-Western Homson Learning, 2001 (Module 2)
8. Panchamukhi, P. R., Economics of Health: An Introductory Review, ICSSR, 2002 (Modules 1 and 2)
10. Tilak, J.B.G., Economics of Inequality in Education, Sage, New Delhi, 1989 (Module 4)
Applied Econometrics for Market Research and Analytics (ECO 231)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: The objective of this four credit course is to introduce students to statistical and econometric methods used in market research and analytics. The focus is on applications of techniques to real world problems using the programming language R and other software like SPSS and STATA.

Evaluation Pattern: The mid-semester examination will be replaced by four examinations of 10 marks each. These examinations will emphasise the ability to apply theoretical knowledge to the real world. One examination will be conducted after teaching for each module is completed. This will be followed by the end-semester examination of 60 marks.

Module 1: Data Structures and Multivariate Methods: (12 Hours)
Simple random samples-multistage surveys-biased samples-quality of survey data-data from social experiments; Multivariate methods-Factor analysis-Principal components analysis-Cluster analysis—conjoint analysis.

Module 2: Bayesian Methods: (12 Hours)
Prior and Posterior distribution-Bayesian point and interval estimation- Bayesian analysis of Linear Regression-Monte Carlo integration Markov Chain Monte Carlo simulation-Gibbs sampler for SUR-data augmentation-Bayesian model selection-Practical considerations.

Module 3: Binary Outcome Models: (12 Hours)
Logit and Probit models-Multinomial models-Tobit and selection models-survival models—models of multiple hazard-models of count data

Module 4: Data and Models: (12 Hours)
Issues arising out of stratified and clustered sampling-treatment evaluation-measurement error models-missing data and imputation-multi-level and hierarchical models

References:

Essential Readings

Time Series Econometrics – I (ECO 232)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: The objective of this course is to impart the necessary econometric understanding required to model and forecast time series data. It emphasises empirical implementation strategies as well as theoretical understanding. It is assumed that the student is familiar with basic concepts of statistical inference that are taught in the Statistical Foundations of Econometrics course. Empirical applications will emphasise the ability to write the relevant algorithms in R programming language.

Evaluation Pattern: The examination pattern will consist of four ten mark examinations (one for each module to be held after the completion of teaching of the respective module) and an end-semester examination for sixty marks.

Module 1: Theoretical Foundations: (12 Hours)
Definition and special features of time series data-Introduction to complex numbers-AR(P) process- Random walks-Ergodicity, stationarity and covariance stationarity-Lag operators, eigenvalues and stationarity-Law of large numbers for serially dependent processes- martingale difference sequence- central limit theorem for martingale difference sequence (without proof)-distribution of OLS estimators for random walk processes- tests for Unit roots: ADF, KPSS, HEGY and Canova-Hansen

Module 2: ARIMA Models: (12 Hours)
AR and Invertible MA processes –autocorrelation and partial autocorrelation functions – Yule-Walker equation- Identification of ARMA models- Estimation of ARMA models – Diagnostic testing- Forecasting

Module 3: Vector Auto Regression and Volatility: (12 Hours)
Identification and Estimation in VAR models - Causality– Impulse Response Function- Variance Decomposition-Cointegration in VAR models- ARCH and GARCH models – testing for ARCH effects- FGLS estimation of ARCH(1) – ARCH in mean, EGARCH models

Module 4: Spectral Analysis: (12 Hours)
Cyclical behaviour and periodicity- The spectral representation theorem- The spectral density- Periodogram and the discrete Fourier transform- parametric and non-parametric estimation of the spectrum – Cross spectrum - Bivariate Granger causality in the frequency domain

References:

Essential Readings

3. Enders Walter, Applied Econometric Time Series, Wiley India, 2004 (All Modules)
Experimental Economics and Market Design (ECO 233)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: Experimental Economics has now become an established part of the discipline. The objective of this four-credit elective course is to introduce students to experimental techniques which will enable them to test economic theory in the laboratory as well as in the field.

Module 1: Introduction to Experimental Methods: (14 Hours)  
Induced Value Theory-Experimental Design: Randomisation, blocking and other efficient designs- dealing with human subjects- mechanics of conducting an experiment including guidelines-data analysis and statistical testing –reporting the results

Module 2: Experiments I: (10 Hours)  
Games: Beauty contest game with variations- One-shot Ultimatum game- Public goods experiment –Voluntary contributions mechanisms with provision points-Productivity under group incentives

Module 3: Experiments II: (12 Hours)  
Market structures and price discrimination-incentive mechanism for control of monopoly- Theories of choice under uncertainty and individual decision making under uncertainty-Search decisions-Expectations and asset valuations

Module 4: Markets and Mechanisms: (12 Hours)  
Markets:-Classic experiments-Hayek Hypothesis-Learning in markets-Auctions: Classical theoretical and empirical results-Implementation games and mechanism design: Experimental evidence on canonical, Groves and Ledyard and Walker mechanisms

References:

Essential Readings

Linear Programming and Data Envelopment Analysis (ECO 234)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: The elective is useful for both industrial analysis and policy guidance in an organization. It deals with resource allocation, cost minimization, maximization of profits, accomplishing multiple goals and so on. It also helps in measuring the performances of similar units. It identifies the extent of inefficiency, the causes for inefficiency and suggests the extent to which the performance can be improved. This course will provide hands on computer for applications and analysis.

Evaluation Pattern: The evaluation will be done through 40 marks of continuous evaluation and a 60 marks end-semester examination. The 40 marks of evaluation will consist of a mid-term examination of 20 marks (two questions to be attempted over one hour) and a project of 20 marks on Modules 3 and 4. The project topics will be announced by the 4th teaching week of the semester and the projects should be in by the 10th teaching week. All modules will carry equal weight for the three hour end-semester examination.

Module 1: Linear Programming: (12 Hours)
Formulation, the graphical method, the simplex method, duality, degeneracy, sensitivity analysis
Special linear programming problems – the assignment problem, transportation problem, linear programming and game theory, linear programming and input output.

Module 2: Extensions in Linear Programming: (12 Hours)
The decomposition method, goal programming – relationships between goal programming and management science /operations research / multiple criteria decision making

Module 3: Concepts of Data Envelopment Analysis (DEA): (12 Hours)
Basic Concepts: A Decision-Making Unit; Measurement of Efficiency; Frontier Analysis, Mathematical Programming Aspects of DEA: Fractional DEA programme – use of Linear Programming; primal & dual in the format required for DEA; output- maximization and input-minimization DEA models

Module 4: Applications: (12 Hours)
Economies of Scale: Variable and Constant Returns to Scale and DEA; Technical and scale efficiencies; Computer applications using industry data; Extensions in DEA: Malmquist Productivity Index, Use of Regressions and sensitivity analysis in DEA.
Practical applications using sectoral data
References:

Essential Readings

3. N.Paul Loomba, Linear Programming: An Introductory Analysis, Tata McGraw –Hill publishing Company Ltd Bombay-New Delhi, 1964 (Module 1, 2)
5. Ramanathan R, An Introduction to Data Envelopment Analysis A Tool for Performance Measurement, Sage Publications New Delhi, 2003 (Module 3, 4)
7. Tim Coelli - DEAP - Data Envelopment Analysis (Computer) Programme, Centre for Efficiency and Productivity Analysis, Department of Econometrics, University of England, Armidale, Australia (Module 3, 4)
Urban Governance and Infrastructure Issues in India (ECO 235)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: Urbanization is fairly recognized as a driver of Economic growth generally as well as in India. Urban Infrastructure is equally well recognized as the numero uno problem that needs serious attention. The course begins by familiarizing the students with the concept and components of Infrastructure and gives a feel for the status and deficit thereof. This course seeks to contextualize urban governance within the fiscal federal structure of India with special emphasis on decentralization. The discussion of 74th Constitutional Amendment is followed by the assessment of the strengths and weaknesses of ULBs. The attempts and approaches at addressing the issues related to infrastructure finance are then studied and the students are made aware of the emerging new financial tools. Whilst the general tone will be relevant to Pan India, illustrations will be drawn from Maharashtra and MMR. The students will be presumed to be familiar with the subject matter covered in the elective course in ‘Urban Economics’.

Module 1: Concept and Components of Infrastructure (12 Hours)
Concept of Infrastructure-physical/social/soft; Components of Infrastructure – transport/communication/power/ water and sanitation/health/education/housing/media – infotainment-heritage-culture/governance; Status and Deficit and urban infrastructure in India.

Module 2: Contextualizing Urban Governance (12 Hours)

Module 3: Urban Governance Conundrum and Illustrations (MMR) (12 Hours)
Issues in Urban Governance-Parastatals – structure and functioning – capacity building, role of civil society; Land Market management and affordable housing; - JNNURM (viability gap funding and basic facilities)

Module 4: Financing Urban Infrastructure (12 Hours)
Internal resources of ULBs, Bank funding; SDOs, Pooled fund (classical and modified), Capital market access (muni-bonds), PPP and variants, TNUDF and water aggregating models.

References:

Essential Readings

1. India Infrastructure Reports (Especially Rakesh Mohan, Urban Infrastructure, Business Models, and Land Management).
2. VSC WPS (Especially WP Nos. 1-3, 5, 7, 8, 10, 11, 15, 16, 20, 23-25, 28, 30, 31).
Multiple Linear Regression and its Extensions (ECO 236)

Number of Credits: 4
Pattern of Evaluation: Non-Standard

Preamble: The Objective of the four credit course is to acquaint students with the theory and practice of multiple linear regression, along with an understanding of the implications and remedial measures associated with the failure of its assumptions.
Evaluation Pattern: The mid semester examination will be replaced by four examinations of 10 marks each. These examinations will emphasise the ability to apply theoretical knowledge to the real world. One examination will be conducted after teaching for each module is completed. This will be followed by the end semester examination of 60 marks.

Module 1: The K-variable Linear Regression Model: (10 Hours)
Matrix formulation of the model-partial correlation coefficients-inference and prediction in the K variable model.

Module 2: GLS Estimation of the Multiple Linear Regression: (10 Hours)
Tests for heteroskedasticity and FGLS estimation in the presence of heteroskedasticity-Tests for autocorrelation and GLS estimation in the presence of autocorrelation-Multicollinearity-implications and remedial measures.

Module 3: Specification Errors and Tests: (12 Hours)

Module 4: Alternative Estimations Techniques: (16 Hours)
Instrumental variables and their properties-non-linear regression-quantile regression-introduction to non-parametric regression-method of moments and OLS as a method of moments problem-GMM estimators and their distribution

References:

Essential Readings

2. Greene, W. Econometric Analysis, Pearson, 2003 (all modules)
Banking: Theory and Policy (ECO 237)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: The objective of the course is to introduce students to the different aspects of commercial banking theory and policy over 48 lectures. The course would discuss the evolution of different kinds of financial systems, the importance of financial intermediaries and the bank as an important financial intermediary. The course would also deal with issues regarding competition in banking, the need for prudential regulation and would discuss the structure of banking in India along with a focus on the role of banks in aiding financial inclusion and as a support for the microfinance institutions.

Module 1: Introduction: (14 Hours)  
Evolution of financial systems (bank oriented and market oriented systems) – Sources and Uses of Funds – need for financial intermediaries – banking in general equilibrium theory

Module 2: Competition in Banking: (10 Hours)  
Competition and Networks (unitary and branch banking) – Effect on reputation and risk taking – Competition and Financial Stability

Module 3: Banking Regulation: (12 Hours)  
Banking Crises/Bank Panics - Need and Scope for prudential regulation – Micro and Macro prudential indicators – Risk-based regulatory capital – Deposit Insurance – Universal Banking

Module 4: Indian Banking: (12 Hours)  

References:

Essential Readings

Additional Readings

4. Reserve Bank of India Bulletins (various issues).
Survival Analysis (ECO 238)

Number of Credits: 2  
Pattern of Evaluation: Non-Standard

Preamble: Survival analysis is applied to data that specifies the time elapsed until an event. It is a mathematical tool of data analysis with wide applications for the study of censored data. Survival analysis can be applied to any branch of Economics to understand the event which includes the transition from failure to success. The objective of the course is to introduce students to survival analysis as a tool for data analysis both in theory and practice with the use of software packages like SPSS and STATA.

Evaluation Pattern: The system of evaluation includes theory and a written assignment. The evaluation will be done through a mid-semester examination of 20 marks, 20 marks for a written assignment and an end-semester examination of 60 marks.

Module 1: Probability Theory and Its Applications in Survival Analysis: (12 Hours)  
Fundamental Theorems of Probability, Mathematical Expectation and Moments, Probability distribution; Discrete and continuous, Duration Models, Functions of Survival Analysis, Survival Time, Non-parametric Approach to Survival Analysis Kaplan-Meier Estimate of Survival Function, Product Limit Life Table, Estimate with Censored Time

Module 2: Life History Analysis: (12 Hours)  
Life-History Analysis, Comparison of Survival Distributions, Parametric Approach to Survival Analysis, Cox Proportional Hazard Model-Basic form of Hazard model, Interactions, Calculation of Life Table from the Proportional Hazard model, Inference and Goodness of Fit. Survival Models-Hazard models with Time Dependence, Time dependent Predictor Variables and Coefficients.

References:

Essential Readings

Economics of Social Infrastructure (ECO 239)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: This is a basic course which will provide a theoretical framework required to examine the issues related to social infrastructure. This paper covers theoretical foundations of Economics of Social Infrastructure and techniques of economic evaluation. The different components of social infrastructure have critical linkages to human development through improving human capabilities and empowerment. Hence, the paper aims to equip students with skills to understand and analyze these linkages. There will be emphasis on policy options and issues for India but will also draw on the experience of other developing countries where relevant.

Module 1: Approaches to Social Infrastructure: (12 Hours)

Module 2: Human Capital – Theory of Human Capital: (12 Hours)

Module 3: Economics of Infrastructure with Special Reference to Health, Nutrition Education and Environment: (12 Hours)

Module 4: Social Sector Policies in India: (12 Hours)
References:

Essential Readings

2. Chelliah, Raja J. and R. Sudarshan (ed.), Income Poverty and Beyond: Human Development in India, UNDP, Social Science Press, New Delhi, 1999 (Modules 1 and 4)
3. Ehtisham A., (ed.) Social Security in Developing Countries, Oxford University Press, New Delhi, 1999 (Module 4)
5. Feldstein, P. J., Health Care Economics, Wiley, 1993 (Module 3)
11. Sen, A., Development as Freedom, Oxford University Press, New Delhi, 1999 (Module 3)
13. Sen, A. Commodities and Capabilities, Oxford India Paperbacks, New Delhi, 2002 (Module 1)
Environmental Economics (ECO 240)

Number of Credits: 4  
Pattern of Evaluation: Standard

Preamble: This course is designed to introduce students to key contemporary issues in environmental economics and equip them with the tools and methodologies that are in general applied to analyze environmental problems and policies. An attempt will be made to discuss the currently debated environmental problems and policies in India and other countries.

Module 1: Economic Growth and the Environment: (12 Hours)
Economic Growth and environment, Limits to growth and Sustainable Development, Environmental Kuznets Curve- Environment as an economic and social good/asset, Natural Resources (Exhaustible, renewable, common property resources) - Accounting and Natural Resource Management- Green Accounting

Module 2: Micro foundations of Environmental Economics: (12 Hours)
Types of goods and services - Public, private and common pool resources, externalities and market failure, Social Cost- Benefit- Analysis, Pollution as a Public Bad, The equi-marginal principle-Economic efficiency versus equity, Damage functions and abatement costs, Role of Institutions in environmental protection, Coase Theorem

Module 3: Supplementary Analytical Tools and Environmental Issues: (12 Hours)
Valuation of Natural Resources: Direct and Indirect Methods Environmental impact assessment, Life Cycle Analysis, Pollution- Air, Water and Noise; Regional, National and Supranational dimensions of environmental degradation, Ozone Layer Depletion, Green House Gas Emissions, Global Warming, and Climate Change

Module 4: Environmental Policy and Practices: (12 Hours)
Few approaches to environmental policy: Command and control - Environmental Standards, Technology Mandates; Market based instruments - Taxes, subsidies, liability instruments tradable permits; Rehabilitation and Resettlement Policy- Kyoto Protocol; Rio debate- Relevant Case Studies

References:

Essential Readings
7. Sankar, U., Policy Instruments For Achieving Low Carbon and High Economic Growth in India (Monograph), National Institute of Public Finance and Policy, New Delhi, 2009
Economics of Services (ECO 241)

Number of Credits: 4
Pattern of Evaluation: Standard

Preamble: The objective of the course is to bring an understanding of economics of services to students. The course deals with various microeconomic and macroeconomic aspects of the service economy. The course includes empirical studies on trade in services and macroeconomic dynamics in services sector growth in India. The discussion on sectoral and sub-sectoral services would be in the formal-informal sector perspective wherever applicable.

Module 1: Introduction to Economics of Services: (12 Hours)
- Concept of service- Attributes of service, Main types of services and their classification, service-goods relationship, economic services; Rural-Urban Services-dualism
- Services Economy- Concept and its role in development
- Knowledge Economy- Concept and Characteristics, Innovation and R&D
- Theory of Unbalanced Growth, Fisher-Clark hypothesis, Fuchs model of inter-sectoral shift in employment, Gemmell’s extension of Fuchs’ model, Neo-Industrial Theory of Self-Services

Module 2: Value and Pricing of Services and Measurement of Service Output:
(12 Hours)
- Calculation of the value of a service product, definition of a unit of service, characteristics of non-market services
- Service production and distribution costs, the basic trade-off and derivation of the supply-system cost function, optimal charges for services
- The provision of services in a market economy, Fee-price of service, Subscription Business model
- Measurement of output and productivity in the services sector; issues and measures

Module 3: Trade in Services: (12 Hours)
- Characteristics of Trade in Services- Melvin Approach to Trade in Services, Jones and Ruane theory of trade in services; Barriers to trade in services and Methods to measure them; World trade in Services- General Agreement on Trade in Services (GATS); India’s trade policy and Trade in Services

Module 4: Services Sector in India: (12 Hours)
- Dynamics of services sector growth in India, Three-sector hypothesis and India, Role of service sector in Indian Economy, Decomposition of Services sector growth in India and its implications. Employment in Services Sector-a gender perspective, Business Services, Telecommunications, Tourism, IT and ITES in India. FDI in services, Public Policy and services- Service Tax in India, Goods and Service Tax, Public Private Partnerships in Services
References:

Essential Readings

1. Akehurst, G. and J. Gadrey, The Economics of Services, Routledge, 1998 (Modules 1 and 2)
2. Chanda, R., Trade in Services and India: Prospects and Strategies, Wiley India, 2006 (Module 3)
3. Chanda, R., Globalization of Services: India's Opportunities and Constraints, Oxford University Press, New Delhi, 2002 (Module 3)
5. Economic Census of India (Latest)

Additional Readings

8. Seth, V. K., Economics of Services, Ane Books India, 2007
Health Economics (ECO 242)

Number of Credits: 4
Pattern of Evaluation: Standard

Note: Students who opt for this course cannot opt for the Elective on ‘Economics of Health and Education’.

Preamble: This course provides the theoretical foundations and economic evaluation of Health Economics. The main focus is the understanding of health issues and policies in a developmental perspective relating specifically to the financing, delivery, and efficiency of health systems. The course also attempts to evaluate policies in the context of market versus State provision of health care.

Module 1: Economics of Health: (12 Hours)
Distinction between health and health care - Determinants of health - Health Accounts: sources of health expenditure; providers of health care and health expenditure by functions - Health care and its linkages with poverty, nutrition; morbidity and mortality - Demand and Supply of healthcare - Opportunity costs and problems of rationing - health care - Costs and efficiency - Types of equity - Markets vs State.

Module 2: Financing Health Care and Delivery of Health Care: (12 Hours)

Module 3: Evaluation of Health Care: (12 Hours)

Module 4: Health Approaches in India: (12 Hours)
Economic dimensions of health system in India - Health Indicators and outcomes - Nutritional concerns - Role of government in health care - Equity issues in health and health care systems - Social and gender inequalities - Social security measures - Health care in India - Health and population policies - Health sector reforms in India.
References:

Essential Readings

5. Musgrove, P., Health Economics in Development, 2004 The World bank. Chapters: 2,3,4,9 and 10 (Modules 1 and 2)
6. Panchamukhi, P. R., Economics of Health: An Introductory Review, ICSSR, 2002 (Modules 1 and 2)
Cities, Citizens and Cinema (ECO 243)

Number of Credits: 2
Pattern of Evaluation: Non-Standard

Preamble: This Elective is an attempt to examine issues of cities and citizens across both time and space through a visual analytical perspective. It is envisaged that this course will integrate theoretical as well as empirical perceptions in the concrete reality of how cinema-citizens have articulated several issues through various portrayals of and within the city. The investigation of economic aspects of citification and metropolitanisation is specifically located in the city of Mumbai/Bombay, and is based on the dialectical relationship between both cause and effect, and also between imagery and reality. It is preferred that students opting for this course have basic knowledge of urban issues.

The course will be divided into three equal phases – the first 8 lecture-hours for collective reading and discussions, the second for Lecture-demonstrations by several visual documentators and chroniclers of identified city economic issues, and the last for formal supervised writing of an assignment based on an integration of the first two phases. Students opting for this course can either analyse a particular issue across several articulations, or several inter-linked issues within specific cinematic materialisations. For instance, migration can be examined regarding the treatment of the issues across selected documentaries, or a single documentation can be critiqued through an investigation of combined issues of migration, displacement, and poverty.

Labour patterns and conditions of work
Migration and displacement
Marginalisation and exclusion
Ghettoisation, settlements and neighbourhoods
Poverty and destitution

References:

Select Readings

1. D’Monte, D., Ripping the Fabric: The Decline of Mumbai and Its Mills, OUP, 2002
3. Harvey, D., Social Justice and the City, University of Georgia Press, 2009
5. Majumdar, R., Bombay Cinema – An Archive of the City, Permanent Black, 200.

Selected Cinema (Indicative)

1. Arrival: Mani Kaul
2. Seven Isles: Films Division
3. Bombay Our City/Hamara Shahar: Anand Patwardhan
4. The City Beautiful: Rahul Roy
5. Seven Islands and a Metro: Madhushree Dutta
6. Roger and Me: Michael Moore
7. Jari Mari – Of Cloth and Other Stories: Surabhi Sharma
8. Bombay Workers: Vincent Derours and Dominique Henry
9. A dollar a Day: Bombay Jungle: BBC

Core References

Preamble: Metropolitan Regions are gaining prominence in India as drivers of economic growth. However, these metropolitan regions face considerable challenges in terms of providing infrastructure and necessary public goods to the population. This course intends to introduce students to the essential aspects of metropolitan (public) finance and the nature of metropolitan governance in India. It begins by providing an exposure to the issues related to metropolitan economies, governments and the basic theory of metropolitan public finance. It then introduces the theory on metropolitan governance and the experience of metropolitan governance in India. Students are then acquainted with metropolitan public finance practices in some developing countries. Finally, the course highlights the complexities and policy debates related to urban land governance and management in metropolitan regions in India. The course is heavy on expected reading requirement.

Module 1: Primer on Metropolitan Regions: Economics, Government, Finance (12 Hours)
An overview of metropolitan issues related to metropolitan economy, government and public finance including grant financing and capital financing. [BLW chapters 1, 2, 3, 4, 6, 9, 13, 15]

Module 2: Metropolitan governance (theory and illustrations from India): (12 Hours)
Conceptual understanding of governance – new institutional economics - transactions cost analysis - consolidation versus polycentricity – governance in India’s metropolitan regions. (VSU WP, CPRR)

Module 3: Metropolitan Public Finance (developing countries’ experience): (12 Hours)
Policy and Administrative Issues – Case Studies of related to China, Sao Paulo, and Mumbai. [BLW chapters 10, 11, 12, 14]

Module 4: Urban Land Management: (12 Hours)

References:

Essential Readings

2. Centre for Policy Research Report [CPRR]: Metropolitan Governance Mega-Cities in India
3. VSU WP numbers: 15, 16, 24, 25, 38, 41, 43, 44.
5. Monetizing Excess Land Study: WB- IDF, George Peterson et al. [MELS]
6. Land Based Fiscal Tools in India, NCAER/GOI: V.K. Phatak [LBFT]
7. Involuntary Re-Settlements Sourcebook: A Planning and Implementation Good Practice Source Book, ADB, November 2012,

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1 Expected pre-requisites: Understanding of Urban Economics/Issues, at the level of Urban Economics Course taught in semester III.
Detailed Rules and Regulations of the Credit-Based System*

The credit-based semester system shall be a two-year four-semester course where a student shall have to acquire 72 credits to qualify for the degree of M.A. in Economics, 36 of which shall be obtained from core courses while the other 36 shall have to be obtained from the electives.

1.0 At the beginning of every semester, the method of assessment for every course being offered in that semester and the allocation of marks between various methods of assessment within the course that shall be followed for each course along with the other information that might be relevant to the assessment of student performance in each course shall be announced.

1.1 The maximum marks obtainable for each course shall be one hundred irrespective of the method of assessment.

1.2 All credits (except for those courses where credits are to be obtained by projects or any other mode as specifically announced from time to time according to 1.0) shall have to be obtained by passing one mid-semester examination and one end-semester examination.

1.3 For every course where credits are obtained by one mid-semester and one end-semester examination exclusively, the mid-semester examinations shall be of forty marks and the end-semester examination shall be of sixty marks. The mid-semester examination shall be of two hours duration and the end semester examination shall be of three hours duration.

1.4 The Director shall determine the time table of the examinations and other methods of assessment including the relevant deadlines, wherever applicable, which would be declared at a time so as to give student sufficient notice. The Director may revise the time table and deadlines provided suitable notice is given to the students.

1.5 Students who cannot appear for the Mid-Sem. or End-Sem. Examination shall be allowed to appear for a Supplementary Examination solely at the discretion of the Examination committee/Director provided the candidate can furnish legitimate reasons for his/her failure to appear for the relevant examination. Students will be allowed to avail of the facility of the supplementary examination only once during the entire MA Programme. Even if the candidate fails to appear for the examination in a single subject, the candidate will have to appear for all the subjects for which that particular examination was held. The performance of the candidate in papers that he/she may have already appeared for in that examination will be considered null & void and only the performance in the Supplementary Examination in those papers will be considered for computing the candidate results. This rule will apply to the ATKT examinations as well. An application to appear for Supplementary Examination will have to be made by the candidate at most one week after the end of the relevant examination. As far as is practicable, the candidate shall be required to furnish documentary evidence in support of his/her claim. For courses other than those covered under 1.3, the Examination committee will arrange for re-examining the student in a manner that it may deem suitable. The End-Semester Supplementary Examination for Semesters I & II will be held after the End-Semester examination of Semester-

* These rules apply to students taking admission from the academic year 2014-15
II. The End-Semester Supplementary examination for Semesters III & IV will be conducted after the regular End-Semester Examination of Semester-IV.

1.6 A student must secure a minimum of 40% marks (mid-semester plus end-semester examination) in a given course in order to obtain the number of credits assigned to that course. A student will be deemed to have passed a course in which he/she obtains a minimum of 40% marks. A candidate who does not score a minimum of 40% of the marks for the course shall be deemed to have failed that course and will be awarded a letter grade “F” for the course.

1.7 A student obtaining the letter grade “F” in a course will be allowed to keep terms and proceed to the next semester if he/she has acquired the grade “F” in not more than four subjects in Semesters I and II.

1.7A A student who has been allowed to keep terms will have to appear for the mid-semester examination of 40 marks and an end-semester examination of 60 marks in the subsequent semester. The provision of supplementary exams can be availed by ATKT students as well.

1.7B An additional end-semester examination of 60 marks may be held after the declaration of Semester IV results for students who fail courses across semesters and the marks obtained in the mid-semester examination will be carried forward. If a student fails the ATKT attempt then an additional end-semester examination of 60 marks may be given and the mid-semester marks of the ATKT attempt will be carried forward. Students of Semesters III and IV who fail in elective courses may be given an additional end-semester examination of 60 marks and the 40 marks obtained in the mid-semester examination will be carried forward. This additional will be given on the basis of an application made by the student within 10 days of the declaration of semester IV results.

1.8 A student who fails in a course shall be allowed to present himself/herself for assessment in the same course when the course is offered again subject to a maximum of three attempts (inclusive of the additional examination) in addition to the original attempt.

1.9 In case a student has failed in a course and the course in which he/she desires to present himself/herself for assessment again is not being offered for any reason, the Examination Committee will hold a mid-semester and end-semester examination at a suitable time which will be intimated to the student sufficiently in advance subject to a maximum of two such attempts.

1.10 Subsequent to failure in an elective course, a student shall be allowed to exercise his/her choice by choosing another elective in place of the one in which he/she has failed in order to obtain the required number of credits provided that the elective is being offered during the semester in which the student wishes to opt for it. He/she will be allowed to exercise his/her choice at the most twice during all the semesters when electives are being offered.

1.11 A student shall have the option of having the result of her/his examination in a particular course declared null and void provided he/she makes an application in writing to the Director of the Department of Economics no later than a week after the result of the end-semester examination is declared. In this case, the candidate shall be deemed to have failed in that course and his/her case will be covered under 1.9 and 1.10.

1.12 A student who has passed in all the core courses and the required number of optional courses and obtained no less than 72 credits shall be eligible for the Master’s Degree.
1.13 The total performance within a semester and the continuous performance from the second semester onwards shall be indicated by a Grade Point Average (GPA) and cumulative grade point average (CGPA). The Class of the student will be decided by overall weighted percentage marks (OWPM) and will be indicated in the fourth semester. The summation in the calculation of CGPA is over all courses whereas in the calculation of OWPM it is over only those courses in which the student has passed. They are to be calculated as follows:

\[
GPA = \frac{\sum (C_i G_i)}{\sum C_i}
\]
\[
CGPA = \frac{\sum \sum C_{i n} G_{i n}}{\sum \sum C_{i n}}
\]
\[
OWPM = \frac{\sum \sum C_{i n} M_{i n}}{\sum \sum C_{i n}}
\]

where

- \(C_i\) = number of credits for the \(i^{th}\) course
- \(G_i\) = grade point obtained in the \(i^{th}\) course
- \(C_{i n}\) = number of credits for the \(i^{th}\) course in the \(n^{th}\) semester
- \(M_{i n}\)= marks for the \(i^{th}\) course in the \(n^{th}\) semester
- \(G_{i n}\) = grade point for the \(i^{th}\) course in the \(n^{th}\) semester
- \(n\) = number of courses offered by student over the semesters.

1.14 Conversion of percentage of marks to grade points:
The marks obtained by a student in a course shall be indicated by a grade point and a letter grade as follows:

<table>
<thead>
<tr>
<th>% of obtained marks by the student</th>
<th>Grade points</th>
<th>Letter grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-100</td>
<td>7.5-10.00</td>
<td>O</td>
</tr>
<tr>
<td>65-74</td>
<td>6.5-7.4</td>
<td>A+</td>
</tr>
<tr>
<td>60-64</td>
<td>6.0-6.4</td>
<td>A</td>
</tr>
<tr>
<td>55-59</td>
<td>5.5-5.9</td>
<td>B+</td>
</tr>
<tr>
<td>50-54</td>
<td>5.0-5.4</td>
<td>B</td>
</tr>
<tr>
<td>40-49</td>
<td>4.0-4.9</td>
<td>C</td>
</tr>
<tr>
<td>0-39</td>
<td>0.0-3.9</td>
<td>F</td>
</tr>
</tbody>
</table>

1.15 Successful Candidates shall be classified as under:

<table>
<thead>
<tr>
<th>OWPM</th>
<th>Letter Grade</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-100</td>
<td>O</td>
<td>Distinction</td>
</tr>
<tr>
<td>65-74</td>
<td>A+</td>
<td>Higher First</td>
</tr>
<tr>
<td>60-64</td>
<td>A</td>
<td>First</td>
</tr>
<tr>
<td>55-59</td>
<td>B+</td>
<td>Higher Second</td>
</tr>
<tr>
<td>50-54</td>
<td>B</td>
<td>Second</td>
</tr>
<tr>
<td>40-49</td>
<td>C</td>
<td>Pass</td>
</tr>
<tr>
<td>0-39</td>
<td>F</td>
<td>Fail</td>
</tr>
</tbody>
</table>

1.16 Ranking: The first three ranks in the masters system shall be decided on the basis of the OWPM.
1.17 The F grade once awarded to a student stays in the grade card of the student and is not deleted even when he/she completes the course successfully later. The grade acquired later by the student shall be indicated in the grade sheet of the subsequent semester in which the candidate has appeared for clearance of arrears.

1.18 The grade card issued at the end of the semester to each student shall contain the following
   a. The credits earned for each course registered in that semester as also credits obtained from courses registered earlier but failed from 1.17 and appeared in that semester.
   b. The performance in each course indicated by the letter grade
   c. The Grade Point Average (GPA) of all the courses registered for that semester
   d. The Cumulative Grade Point Average (CGPA)
   e. Overall Weighted Percentage of Marks (OWPM), the overall class, after completing the program (this will appear only on the grade card for the fourth semester).

1.19 After the mid-semester examination, the concerned teacher shall put up the marks obtained by each student in that examination within 10 days of the end of the examination. The results for the end-semester examination will be declared within a reasonable period.

1.20 A student who feels aggrieved about the marks awarded to him/her shall have the right to see his/her answer paper within a week of the marks being put up. The teacher shall have to explain to the student the marks awarded. The student shall have the option of applying to the Chairperson, Examination Committee. The Committee shall meet and after examining the student’s case, appoint the second examiner if it is convinced that the student’s claim is genuine. The new examiner shall reassess the answer sheet. If there is a difference of 10% marks between the original teacher’s and fresh examiner’s evaluation, or if the marks after revaluation lead to a change in the result of the student, the new (re-valued) marks will apply. In case the marks obtained by the student undergo a change after this process, the new marks will be used to compute the student’s performance according to 1.13, 1.14, 1.15, 1.16, 1.17, 1.18 and 1.19.

1.21 The process laid down in 1.21 will be completed in a maximum period of thirty days from the date on which the student applies in writing to the Examination Committee for the first time.

1.22 The Examination Committee will have the power to modify/amend/repeal any of the items listed under 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 1.19, 1.20, 1.21, 1.22.

1.23 A student having less than 75% attendance for lectures held in a given course will not be allowed to appear for the end-semester examination and shall be deemed to have failed in that course.

1.24 Students of third and fourth semesters would give a declaration regarding how many papers they would be graded for. The declaration would be submitted to the office before the finalization of results. Students who choose to audit a course would be expected to attend the lectures regularly. An attestation by the teacher is required. Thereupon, the Director would give a certificate.

1.25 In the case of class improvement, the following hold:
   a. Improvement will be allowed only for the core courses, i.e., the 1st and/or 2nd semesters and only for those students who have secured less than a first class,
b. All the papers in that semester will have to be attempted,
c. Improvement can be undertaken either by taking admission for the semester/s concerned or by appearing for the end-semester examinations of the core semester/s. Semester fees (along with examination fees) will have to be paid in the first case, whereas only the examination fees will have to be paid in the second case. Students taking admission to the semester/s will appear for both 40 and 60 marks components of the examination, whereas students admitted only for the examination will take the end-semester examination only. The 40 marks component for these students will be carried forward from the original performance of the students in that particular semester. In either case, students opting for improvement will take the examinations along with regular students.
d. The grade sheets incorporating the new improved class will be given to students on surrender of the earlier grade sheets for all the semesters. The student will retain the original result and the grade sheets if there is no improvement in the class obtained.

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