

SCHEME OF STUDIES



M.Sc
ECONOMICS
For
Distance Learning
2 years programe (4 semesters)

Department of Economics
GOVERNMENT COLLEGE UNIVERSITY
Faisalabad

Scheme of Study for M.Sc. Economics

1st Semester				
Sr. #	Course Title	Course Code	C.H	Total Marks
1	Micro Economics-I	ECO-551	3(3-0)	60
2	Macro Economics-I	ECO-553	3(3-0)	60
3	Mathematical Economics-I	ECO-555	3(3-0)	60
4	Economics Statistics	ECO-557	3(3-0)	60
5	Introduction to computer	ECO-559	3(3-0)	60
Total			15	300
2nd Semester				
Sr. #	Course Title	Course Code	C.H	Total Marks
1	Micro Economics-II	ECO-552	3(3-0)	60
2	Macro Economics-II	ECO-554	3(3-0)	60
3	Mathematical Economics-II	ECO-556	3(3-0)	60
4	Statistical Inference & decision making	ECO-558	3(3-0)	60
5	Public Finance	ECO-560	3(3-0)	60
6	Monetary Economics	ECO-562	3(3-0)	60
Total			18	360
3rd Semester				
Sr. #	Course Title	Course Code	C.H	Total Marks
1	Islamic Economics	ECO-651	3(3-0)	60
2	Econometrics-I	ECO-653	3(3-0)	60
3	Major Issues in Pakistan Economy	ECO-655	3(3-0)	60
4	Research Methodology	ECO-657	3(3-0)	60
5	Environmental Economics	ECO-659	3(3-0)	60
Total			15	300
4th Semester				
Sr. #	Course Title	Course Code	C.H	Total Marks
1	Development Economics	ECO-652	3(3-0)	60
2	International Economics	ECO-654	3(3-0)	60
3	Econometrics II	ECO-656	3(3-0)	60
4	Computer Application in Quantitative Analysis in Economics	ECO-658	3(3-0)	60
5	Thesis	ECO-680	6(6-0)	120
6	OR Two optional courses Managerial Economics* Agriculture Economics*	ECO-662 ECO-664	3(3-0) 3(3-0)	60
Total			18	360
Grand Total			66	

* Optinal Courses				
Sr. #	Course Title	Course Code	C.H	Total Marks
1	Agriculture Economics	ECO-662	3(3-0)	100
2	Managerial Economics	ECO-664	3(3-0)	100
3	General Equilibrium and Welfare Economics	ECO-666	3(3-0)	100
4	Labor Economics	ECO-668	3(3-0)	100
5	Advanced Mathematical Economics	ECO-670	3(3-0)	100
6	Project Appraisal and Investment Analysis	ECO-672	3(3-0)	100
7	Dynamic Macroeconomics	ECO-674	3(3-0)	100
8	Population Economics	ECO-676	3(3-0)	100
9	Operations Research	ECO-678	3(3-0)	100

ECO-551. MICRO-ECONOMICS-I 3(3-0)

Introduction

Microeconomics: Comparison with other Branches of Economics. An Overview of Microeconomics Topics, Consumer's Decision, Markets, Economic Models. Development of the Economic Theory of value. Production, Cost and Welfare. Cost Minimization, Introduction to Maximization of a functions. Functions of several variables & their optimization. Implicit functions. Derived Demand. Game Theory.

Theory of Consumer Behavior and Demand Analysis

Axioms of Rational Choice. The utility function, Arguments of utility function. Indifference curves and Marginal Rate of substitution (MRS). Indifference curves and Transitivity. Convexity of Indifference curve. An alternative derivation: Marginal utility, MRS. Concepts of Perfect substitutes and perfect complements. Non-homothetic Preference. Consumer's equilibrium. Income & Substitution effects: Hicksian Framework and Slutsky equation. Revealed Preference and the Substitution effect. Indirect utility function & its derivation.

Market Demand & Elasticity

Market demand curves. Types of demand curves. Short Run and Long Run analysis: Elasticity and relationships among elasticities of demand. Theoretical issues in Market demand analysis. Implication of Elasticities and Problem Solving Approach. Identification of Inferior goods, Giffin goods and normal goods.

Production Functions

The Concept of Production Function; how to Choose Variables. Variation in one input. Isoquant Maps and the rate of technical substitution. Returns to scale. The elasticity of substitution. Some common production functions. Technical progress. Equilibrium of the firm. Cobb Douglas Production function. CES Production Function. Trans log Function.

Cost of Production

Definition of costs. Cost functions. Traditional Vs Modern theory of cost. Changes in input prices. Short Run, Long Run distinction. Input substitutability. Input Cost and Demand for Factors of Production. Derived Demand. Cost Minimization. Decreasing and Increasing Cost Industry and Price Determination.

ECO-552. MICRO-ECONOMICS-II 3(3-0)

Profit Maximization and Supply

The nature & behaviour of firms. Profit maximization. Marginal Revenue. Short Run supply by a Price taking firm. Profit maximization and input demand. The controversy over the profit maximization hypothesis. Cost minimization. relationship between cost and production curves.

The Theory of Market Behaviour

Perfect competition: The Perfectly competitive market: The assumptions of the Model: Short run equilibrium of the price taker firm: Long run equilibrium of the price taker firm: Equilibrium of the industry: Mathematical Derivation of Equilibrium Prices and Quantity: Difference between Perfect and Pure Competition; Price and Output Decision. Mathematical derivation of Price and Quantity.

Monopoly: Monopoly & its Basics:

The negatively sloping demand curve: Short run equilibrium, Long Run Equilibrium: Price discrimination: Bi-lateral Monopoly: Multiplant Monopoly: Comparison with perfect competition: Monopoly and Price Distribution. Monopoly and Price Discrimination. Mathematically Price and Quality Solution.

Monopolistic competitive conditions: The historical setting of the theory of monopolistic competition, Characteristics of Monopolistically competitive firms. The concepts of industry & group: The basic Chamberlain theory of Monopolistic competition. Comparison with pure competition & monopoly. Mathematical Derivation of Price and Output Decision under Monopoly.

Oligopolistic conditions: A simple statement of the problem of oligopoly: Models of Non-collusive Oligopoly: Cournot, Bertrand, Chamberlin, Sweezy & Price Leadership Collusive model of oligopoly: cartels & price leadership models. Mathematical Derivation of Price and Quantity Determination. Monoposony and Buying Power; influence on Price.

Game Theory

Description of a Game Theory. The Payoff Matrix of a Game. Nash Equilibrium. The Prisoner's Dilemma. Sub-game Perfect Equilibrium: Sequential Equilibrium. Application of Game Theory. Cournot Equilibrium. Bertrand Equilibrium. Quantity Leadership (Stackleberg Model) Price Leadership. Collusion (Cartel). Conjectural Variation. Stackleberg Case.

Pricing of Factors of Production

Short Run Demand for one Variable Input. Input price Elasticity. The Short run Demand Curve. Variable inputs. Market demand Curve for an Input: The Price of fixed Factors: Rents & Quasi-rents. The Supply Curve of Labour: Wage Determination, Role of Unions.

General Equilibrium

Assumptions of the 2 X 2 X 2 models. Edge Worth Box diagram, Pareto Optimality; Equilibrium conditions. Concept of Contract Curve , Static Properties of A General Equilibrium Model. General Equilibrium and the Allocation of Resources. Arrow's Impossibility Theorem.

Welfare Economics

Meaning of Economic welfare. Criteria of social welfare. Welfare Maximization. Welfare Maximization and perfect Competition. Market failure and public goods/social goods. Externality analysis. Anti-trust Policy and regulations.

Uncertainty and risk Analysis

Concept of expected utility & its theorem. Uniqueness of expected utility function. Affine function. Risk aversion and Risk loving in Risk neutral. Arrow Pratt measure of (absolute) risk aversion. Measurement of risk aversion. Global Risk aversion. Arrow Pratt measure of relative risk.

Recommended Books:

1. Ferguson, C.E & Gould, J.P, Microeconomic Theory. Macmillan, (Latest Edition).
2. Henderson, J.M & Quandt, R.E., Microeconomic Theory*. N.Y Melliwra H A Book Co.
3. Koutsoyiannis, A., Modern Microeconomics*, London, Macmillan, (Latest Edition).
4. Layard and Walter A.A., Micro-Economics*, McGraw Hills, (Latest Edition).
5. Varian Hal R., Micro Economics Analysis*, Norton & Company, New York, 1992.
6. Walter Nicholson, Microeconomic Theory: Basic Principles and Extensions (6th edition).

ECO-553. MACRO-ECONOMICS-I

3(3-0)

Introduction and National Income

The Development of Macroeconomics, Actual vs. Potential Output, Analytical Approach to Macroeconomics. Circular Flow of National Income, Measurement of GNP: Expenditure Approach, Product Approach / Income Approach, GNP as measure of welfare. Leakages and Injections: Saving and Investment and their Role. Nominal and Real Variables. Economic Models, Exogenous and Endogenous Variables and their Functional Relationships. Leading and Lagged variables. Measuring Unemployment: Oken's Law. How to build simple Macroeconomic Models, Price Indices; Inflation Indexes, Deflation and Stagflation. Introduction to Keynesian and Classical School of Thoughts.

Income Determination

Firm's Demand for Factors of Production, Production Function, Demand for Labor and Capital: Marginal Product of Factors and their Demand. Labor Market and its Equilibrium. Demand for Goods and Services: Aggregate Demand and its Components: Consumption, Investment, Government Spending and Net exports. Equilibrium of Aggregate Demand and Supply: Mathematical Solution and Equilibrium. Saving and Investment Balance. Derivation of Simple Multiplier, Tax Multiplier. Inclusion of Imports and Multiplier.

Theories of Consumption and Their Implications

Theories of Consumption: Duesenbury Hypothesis, Keynesian Consumption Function. Permanent Income Hypothesis / Life Cycle Hypothesis, Beyond Permanent Income Hypothesis, Kuznet's findings and Reconciliation of Marginal Propensity to Consume and Average Propensity to Consume and Evidences. Mathematical derivation of Consumption Models. The MPS Model, Wealth effect in the Static Model. Implications of Consumption Theories for Policy Formulation and Stabilization Policy. Random Walk Model.

ECO-554. MACRO-ECONOMICS-II 3(3-0)

Saving and Investment

Definition and Kinds of Investment; Autonomous and Induced etc. Determinants of investment. Present Value Criteria for Investment. Investment Demand and Output Growth. Tobin's Q-Theory. Lags in Investment Demand. Derivation of IS-curve, Shape of IS-curve. Volatility of Investment. Investment Demand and Fiscal Policy. Shifts in Investment Demand Curve and output determination.

Money Market: The Demand and Supply of Money

Money Demand and its Determinants, Regressive Expectation Model. Portfolio Balance Approach, Empirical Estimation of Income and Interest Elasticities. Supply of Money, Determinants of Money Supply. Measurement of Money Supply and its implications, Instruments of Monetary Policy. Interest Sensitivity of Money Supply. Quantity Theory of Money and its Critical Review. Fischer effect, Money, Prices and Inflation. Derivation of LM Curve and its Slope. LM Curve and Money Market Equilibrium. Interaction of IS-LM and Equilibrium.

Aggregate Demand, Supply and Stabilization Policy

Keynesian Models: Liquidity Trap. Effectiveness of Policy and Price Rigidity. Slope of Aggregate Supply and Demand Curves. Liquidity Trap. Grand Aggregate Demand Curve. Interaction of IS-LM and Determination of output: Short-run and Long-run analysis: Aggregate Demand and Supply and their Slopes. Slope of IS-LM in Short-run and Long-run. Vertical / Horizontal Shapes of these Curves. Classical and Keynesian Models. Shocks to Aggregate Demand and Supply and Stabilization Policy. Supply Side Economics. Stagflation and Stabilization Policies, Shocks to IS-LM and its Outcomes and Policy Implications. Short-run – Long-run Philip Curves. Long-run and Vertical Aggregate Supply Curve. Ineffectiveness of Keynesian Policies, Technical Change and Shift in Vertical Aggregate Supply Curve.

Recommended Books:

1. Mankiw, Gregory N., (2000) *Macroeconomics**, Worth Publishers, New York.
2. Peel D. and Minfow P., (2002). *Advance Macroeconomics*, Edward Elgar, Cheltenham, U.K.
3. Romer, David, (latest edition). *Advanced Macroeconomics**, McGraw Hills, New York / London.

ECO-555. MATHEMATICAL ECONOMICS-I 3(3-0)

The Nature of Mathematical Economics

Ingredients of mathematical models. Derivations: Equation of a straight line and its forms: Two point, intercept, point slope and slope intercept. Types of functions: constant,

polynomial, rational, non-algebraic. Relationships and functions. Indices & their rules. Functions of more than two independent variables. Logarithms & the rules of logarithms.

Equilibrium Analysis in Economics

A linear partial equilibrium market model. The effect of an excise tax in a competitive market. Non linear market model. General Market Equilibrium. Equilibrium in a linear National Income Model.

Linear Models and Matrix Algebra

Theory of matrix multiplication. Laws of matrix operations. Types of matrices: Square, identity, null, idempotent, diagonal, transpose and their properties. Conditions for non singularity of a matrix. Minors and cofactors. Determinant & its properties. Solution of linear equations through Gaussian method, Cramer's rule and Inverse of a matrix method. Properties of inverse of a matrix. Use of matrix approach in market & national income models.

Input-Output Analysis

Input-output model, its structure and its derivation. The use of input output model in Economics.

Differentiation

Rules of differentiation. Differentiation of a function of one variable. Sum-difference, product, quotient, chain, power, inverse, logarithmic & exponential functions Combinations of rules. Higher order derivatives. Economic applications of derivative. Concept of maxima & minima, elasticity and point of inflection. Profit & revenue maximization under perfect competition, under monopoly. Maximizing excise tax revenue in monopolistic competitive market, Minimization of cost etc.

ECO-556. MATHEMATICAL ECONOMICS-II

3(3-0)

Partial & Total Differentiation

Partial differentiation & its rules. Higher order & cross partial derivatives (young's theorem). Total differential & total derivatives. Implicit functions rule of differentiation. Optimizing cubic functions & their Economic application.

Economic Applications of Partial & Total Differentiation

Comparative static analysis: a linear Partial equilibrium market model, a linear National Income model. Partial elasticities. Production functions Analysis. Maximization & Minimization of unconstrained functions & their Economic applications: Profit maximization by a multi-product firm under perfect Competition & monopoly, Price discrimination, Multi-plant monopoly, input decisions etc.

Optimization: Constrained & Extrema

Free and constrained optimization, extrema of a function of two variables: graphical analysis, Lagrange method. Utility maximization & Cost minimization. Homogenous Production function, Cobb Douglas Production function. Jaccobian determinants.CES Production Function. Translog Function.

Linear Programming

Ingredients of linear Programming. Graphical approach, simplex method, ECOomic application of linear programming. Concept of primal & dual. Duality theorems. Solving of Primal via dual. ECOomic interpretation of a dual.

Recommended Books:

1. Chiang, A. C.,Fundamental Methods of Mathematical Economics, McGraw Hills, (Latest Edition).

2. Baumol W. J., *Economic Dynamics*, Macmillan, (*Latest edition*).
4. Dowling E. T., *Mathematics for Economists*, Schum Series (latest edition).

ECO-557. ECONOMICS STATISTICS 3(3-0)

Introduction

Descriptive and inferential statistics; Variable and constant, population and sample, parameter and statistic; The four basic activities in statistics: Designing a plan for data collection, Exploring the data, Estimating an unknown quantity, Hypothesis testing; Type of measurement scales: Nominal, Ordinal, Interval and Ratio; Types of data: Univariate, Bivariate and Multivariate data, Primary and secondary data, Quantitative data and qualitative data, Time series, Cross-sectional and pooled data; Significant digits and rounding off numbers; Errors: Biased and unbiased.

Presentation of Data and Measure of Central Tendency

Introduction; Classification; Tabulating numerical data: The frequency distribution, The cumulative frequency distribution, The relative frequency distribution, The percentage frequency distribution; Graphic and diagrammatic representation: Bar chart, Pie chart, Histograms, Frequency curves and Histograms; Histograms by Hand: Stem-and-leaf.

Measure of central tendency; Introduction; Types of Averages: Mean: Arithmetic mean, Geometric mean, Harmonic mean, Trimmed mean and Winsorized mean; Quintiles: Median, Quartiles, Deciles, Percentiles; The mode; Box plot and detailed box plot; Empirical relation between Mean, Median and Mode; The cumulative distribution function: Finding the percentile ranking for a given number, Finding the percentile for a given percentage; Summary measures and type of data.

Measures of Dispersion, Skewness and Kurtosis

Absolute and relative measure of dispersion; Different measures of dispersion: The Range, Quartile deviation, Mean deviation, Variance and standard deviation: Definition and interpretation of variance and standard deviation, Computation of variance and standard deviation, Step deviation method or coding method, Coefficient of variation, Standardized variable, Properties of standard deviation and variance; Skewness: Karl Pearson's coefficient of skewness, Bowley's coefficient of skewness; Kurtosis.

Probability and Probability Distribution

A survey of probability concepts: Classical probability, Empirical concept, Subjective probability; Some rules of probability: Rules of addition, Rules of multiplication; Tree diagrams; Conditional Probability, Bayes Theorem; Counting rules: The multiplication formula, The permutation formula, The combination formula. Discrete probability distribution, Random variables, Discrete random variable, Continuous random variable; The mean, variance and standard deviation of a probability distribution; Binomial probability distribution, and its computation. Cumulative probability distributions, Properties of Binomial probability distribution. The normal probability distributions: Properties of normal distribution, Applications of the standard normal distribution, Areas under the normal curve, Finding areas under the normal curve; The normal approximation to the binomial; Continuity correction factor.

Simple Linear Regression and Correlation Analysis

Scatter diagram; Standard methods for obtaining regression line: (i) Inspection, (ii) Semi average, (iii) Least squares principle; Assumptions underlying linear regression; Measures of variation: Standard error of the estimate, Coefficient of determination; Prediction in Regression Analysis; Interpolation versus extrapolation; Correlation analysis; Scatter diagram; The coefficient of correlation: Properties/characteristic of coefficient of correlation, Correlation and causation; The relationship among the correlation coefficient, the coefficient of determination and the standard error of estimate; Inference about the slope and correlation coefficient; t-test for the slope, F-test for the slope, t-test for correlation coefficient; Estimation of the mean values and prediction of individual values; Confidence interval and prediction interval estimate; Rank correlation.

Multiple Linear Regression and Correlation Analysis

Multiple linear regression model, Interpretation of partial regression coefficients; Estimation of multiple linear regression model with two explanatory variables by using Least squares

principle, Matrix approach, Deviation form; Pitfalls and problems in multiple regression: Multicollinearity, Variable selection, Model misspecification; Multiple standard error of estimate; Coefficient of multiple determination (adjusted and unadjusted); Evaluating the regression equation: Using a scatter diagram, Correlation matrix, Global test, Individual variable significance test, Qualitative independent variables; Multiple regressions in terms of linear correlation coefficients; Multiple correlation and partial correlation; Nonlinear regression models; Dealing with nonlinear relationship and unequal variability.

ECO-558. STATISTICAL INFERENCE AND DECISION MAKING 3(3-0)

Survey Sampling and Sampling Distributions

Sampling the population, Advantages of sampling, Representative samples, Sample design and sample survey, Sampling frame, Probability and non-probability sampling, Sampling with and without replacement, Sampling and non-sampling error, sampling bias; Probability sampling and non-probability sampling methods; Sampling distribution of the mean; The central limit theorem; Sampling distribution of differences between means; Sampling distribution of sample proportion; Sampling distribution of differences between proportions.

Estimation and Confidence Intervals

Point estimates and confidence intervals; Estimation by confidence interval: Confidence interval estimate of a population mean (Known Variance), Confidence interval estimate of a population mean (Unknown Variance) Confidence interval for differences of means, Confidence interval for differences of means; Confidence interval for population proportion, Confidence interval for differences between proportions; One sided confidence interval; Sample size for estimating population mean.

Hypothesis Testing

One sample test of hypothesis; One Sample; One tail and two tails tests of significance; Testing for a population mean with a known population standard deviation: Two-tailed test, one-tailed test; P-Value in hypothesis testing; Testing for a population mean: Large sample, Population standard deviation unknown; Testing hypotheses about population proportion when sample size is large; Type II error. Testing of two Sample Hypothesis: Population means, Population proportions; comparing populations with small samples.

Chi Square Applications

Introduction; Goodness-of-fit test: Equal expected frequencies; Goodness-of-fit test: Unequal expected frequencies; Limitations of Chi square; Using the goodness-of-fit test to test for normality; Contingency Table Analysis.

Analysis of Variance

Introduction, The F distribution; Comparing two population variances; ANOVA assumptions; ANOVA test; Inferences about pairs of treatment means; Two-way analysis of variance.

Applied Statistics

Index Numbers, Un-weighted index numbers; Simple aggregative index; Weighted indexes; Laspeyre's price index, Paaseche's price index, Marshal- Edgeworth price index; Fisher's ideal index; Consumer Price Index (CPI), Producer Price Index (PPI), CPI versus GDP Deflator; Issues in constructing and using index numbers; Application of index numbers to business and ECOomics. An overview of time series analysis; Component Factors of the classical multiplication time series model and their estimation: Secular trend; Cyclical variation, Seasonal variation, Irregular variation; Smoothing the annual time series and using it in forecasting: Moving averages, Weighted moving averages, Exponential smoothing; Using trend and seasonal component in forecasting; Time series and forecasting; The multiplicative model, Calculating the seasonal indexes, De-seasonalization the time series, Using deseasonalized time series to identify trend, Seasonal adjustments, Model based on monthly data, Cyclical component; Modeling cyclic behavior using box-Jenkins ARIMA processes; Using regression analysis in forecasting; Qualitative approach to forecasting: Delphi method, Expert judgment, Scenario writing, Intuitive approaches; Choosing an appropriate forecasting model; Some observations on time series analysis.

Recommended Text books:

1. Lind, Douglas A., Marshal, William G. and Mason, Robert D. 2003. *Statistical Techniques in Business and Economics* (11th edition). Boston: McGraw Hill,
2. Chaudhry, S.M. and Kamal, S. 2002. *Introduction to Statistical Theory* (7th edition). Lahore: Ilmi Kitab Khana, 2002.
3. Siegel, A. F. 2003. *Practical Business Statistics* (5th edition). Boston: McGraw Hill, 2003.
4. Newbold, P. Carlson, W.L. and Thorne, B. M. *Statistics for Business and Economics* (5th edition). New Jersey: Prentice Hall, 2002.
5. Keller, G. and Warrack, B. 2000. *Statistics for Management and Economics* (5th edition). Boston: Duxbury Thomson Learning.

Additional Readings:

1. Berenson, Mark L., Levine, David M. and Krehbiel, Timothy C., *Basic Business Statistics: Concepts and Applications* (9th edition). New Jersey: Prentice Hall, 2004.
2. Barron, Michael M., *Statistics for Economics Accounting and Business Studies* (Latest Edition), New York, Prentice Hall.

ECO-560: PUBLIC FINANCE 3(3-0)

Introduction and Role of Public Sector

The Economic Functions and Public Goods: Allocation of Resources, Redistribution of Income and Wealth and Stabilization. Pricing Public Goods.

The Theory of Public Goods

Fiscal Principles and Concepts: The Traditional Principle of Tax Neutrality is Expanded Principle of Fiscal Neutrality. Exhaustive Vs. Non-Exhaustive Public Expenditures, Income Elasticity of Government Expenditures, Tax Vs. Non-tax Revenues, MicroEconomic Vs. MacroEconomic Regulatory Taxes, Tax Base, Tax Rate Relationship; Progressive, Regressive and Proportional Taxes, Marginal Propensity to Tax and Marginal Vs. Average Tax Rates; Income Elasticity of a Tax Integral Fiscal Non-Neutrality. Tax Efforts and Tax Collection Performance in Pakistan.

Public Revenue and Taxes

The Economic Case for the Public Sector to Allocate Resources: Market Imperfections, Decreasing Costs of Production, Public Goods and Externalities. Pricing Decreasing Cost Industry.

The Theory of Public Goods

Public and Private Goods, Pure Public Goods, Should Public Sector be Produced Vs. Private Goods? Semi Public Goods, Merit Goods, Free Rider Problem, Externalities and Public Policy.

Distributional Equity in Taxation

The Ability to pay and Economic benefits (received), Canons of Taxation, The Optional Income Tax Approach. Optimum Tax and Revenue Collection.

Tax Structure of Pakistan

Various Kinds of Taxes and their Objectives / Performance in Pakistan. Income and Sales Taxes, Excise and Custom Duties, Export and Import Taxes, Tax Reforms in Pakistan and their Impacts.

Tax Shifting and Incidence

General Equilibrium Vs. Partial Equilibrium: Tax Incidence Analysis. Determinants of Tax Shifting under Partial Equilibrium Conditions. Impacts of Tax Shifting on Price.

Fiscal Policy: Public Expenditure and Budget

Theories of Public Expenditures, Wagner's Law, Efforts of Public Expenditures. Components of Public Expenditures in Pakistan, Sources and Direction of the Growth of Public Expenditures. Kinds of Budget, Surplus, Deficit and Balanced: Preparation of Budget Cycle in Pakistan, Development and Non-Development Budget and its Patterns. Zero Based Budget, Planning, Programming Budgeting System.

Public Debt

Need and Burden of Public Debt: Domestic and Foreign. Debt Modeling and Forecasting Debt Needs. Optional Debt. Debt Modeling and Offer Curve, Problem of Debt Servicing, Structure of Public Debt in Pakistan: Internal and External Debt Problem of Pakistan. Ricardian View of Public Debt.

Recommended Books:

1. Bernard P. Herber, (1999), Modern Public Finance.
2. David N. Hyman, (1996), Public Finance, A Contemporary Application of ---. Harcourt Brace College Publishers.
3. Rosen and Harvey S., (1999), Public Finance, McGraw Hill.
4. Musgrave R.A. and B.P., Musgrave (Latest Eds.), Public Finance in Theory and Practice, McGraw Hill.
5. Stiglitz E., (2000), ECOomics of The Public Sector, W. W. Norton & Co.

ECO-562: MONETARY ECONOMICS 3(3-0)

Introduction and Development Of Monetary Mechanism

Evolution of Money and Payment System. Definition of Money Function of Money & Measurement of Money. Demand for Money & Supply of Money. Definitions of Money, M1, M2, M3, L etc.

Role of Money in the Economy

Debate on neutrality and non-neutrality of Money. Classical Dichotomy and Keynesian Integration of Nominal and Real Sectors. Role of Money in the IS-LM Framework. Money in Aggregate Demand & Aggregate Supply Analysis. Keynesian Vs. Monetarist views of Equilibrium Output, Employment and Prices.

Demand for Money

Quantity Theory of Money. Transaction Theories of Demand for Money. Portfolio Theories of Demand for Money. Baumol – Tobin Model of Cash Management. Friedman's Restatement of Quantity Theory of Money: Empirical Evidence on the Demand for Money.

The Money Supply Process

Monetary Base, Keynesian Liquidity Preference Framework, Friedman's Modern Quantity Theory of Money. Multiple Deposit Creation: Introducing the Money Supply Process. Determinants of the Money Supply: Exogenous and Endogenous. Understanding Movements in the Monetary Base, Money Multiplier. Velocity of Money and its variability. Explaining Depositor and Bank Behaviour: the Complete Money Supply Model. Regressive Expectation Model.

The Conduct of Monetary Policy: Central Bank

Structure and Functions of Central Bank. Independence of Central Bank and its role in ECOomic Growth. Tool of Central Bank for Money Control. Monetary Base. The Conduct of Monetary Policy: Goals and Targets. Tools of Monetary Policy: Three Major Tools of Monetary Policy. Required Reserve Ratio, Discount Window Loans and Open Market Operation. Advantages and Disadvantages and Impact Analysis of each Policy Tool. Central Bank as a lender of last Resort. Financial Intermediaries. Monetization of Public Debt. Ineffectiveness of Stabilization Policies. Targeting interest rate and inflation.

Money & Interest Rates

Determinants of interest rates. Kinds of Interest Rates. The Behavior of Interest Rates. Understanding & Measuring the Interest Rates. Real & Nominal Interest Rates, Theories of Interest Rate Determination. The Risk and Term Structure of Interest Rates. The Distinction Between Interest Rates and Returns. Maturity & Volatility of Bond Returns. Portfolio Choice: the Theory of Asset Demand.

Money and Inflation

What is Inflation & Causes of Inflation? Demand – pull Inflation, Cost – push Inflation, Stagflation & Hyperinflation. Inflation as a Monetary Phenomenon. The Philips Curve and Accelerating Inflation. Inflation in Pakistan: Sources and Managing Policies. Sources of Inflation in Pakistan: Spiracle Evidences. Policies to Combat Inflation in Pakistan.

Monetary Policy in International Framework

Money Demand and Empirical Evidences. Money in Growth Models. Inflationary Spiral. Current Issues in Monetary and Financial Sector Reforms. Conduct of Monetary Policy in Fixed and Flexible Exchange Rates. Perfect Mobility of Capital and Money Control, Effectiveness of Policy. Impact of Reserves on B.O.P and Exchange Rates. Targeting exchange rate. Managed Exchange Rate System and Monetary Policy. Targeting Inflation. Exchange Rate and Balance of Payment.

Recommended Books:

1. Fredric S. Mishkin, (1995), Financial Markets and Money, Harper & Row Publishers.
2. Laider, David E.W (1996), The Demand for Money: Theories, Evidence and Problems (Fourth edition), Harper & Row, Publishers, New York.
3. Miller, R. L. and David VanHose, (2001), Money, Banking & Financial Markets. South Western, Singapore.
4. Mishkin, Frederic S., (2001), The ECOomics of Money, Banking and Financial Markets. (Sixth edition). Addison Wesley, New York.
5. Vanish K., Monetary Theory, (2000), Vikas Publishing House, Delhi.

ECO-651. ISLAMIC ECONOMICS 3(3-0)

Note: The instructor concerned may assign additional and latest literature on the subject matter. The references provided at the end of the course are just helping literature. Students must consult additional literature on each topic.

Introduction: Islamic Economics

Nature, and Importance of Islamic Economics. Islamic Economics Versus Economics of Secular ECOomy and Mixed ECOomic System. Brief Introduction of Basic Values of Islam; Taqva, Halal and Haram, Justice, Benevolence, Equality, Brotherhood and Cooperation as Determinants of ECOomic Behaviour and Policies.

Major Economic Thoughts: Contribution of Scholars

Contribution of some Earlier Muslim Scholars in the Development of Islamic Economics (Imam Abu Yousuf, Imam Abu Ubaid Al Qasim,, Ibn-e-Khaldoon, Imam Ibn-e-Taimiah, Shah Waliullah Dehlvi, Baqar-al-Sadar).

Islamic Economic System

Silent features of Islamic Economic System; objectives, Economic Freedom, Property and Ownership Rights. The Concept of Equality and Efficiency. The Relative Importance of Capital and Labour. Priority to Basic Needs. Concepts of Ownerships and Implication. Welfare and income Distribution. Comparison of Islamic Economic System with Capitalism and Socialism, with respect to above cited principles / values of Islam.

Microeconomics in Islamic Framework

The Consumer Behaviour in Islam. Utility, Moderation, optional Consumption Behaviour.

Organization of Production and Behavioural Theories of Firms.

Objectives and Behaviour of Firm in Islamic ECOomy. Business Ethics in Production and Marketing. Hoarding and Gains. Market Structure – Monopoly and Competition, Resource Allocation in Islamic Environment and Cartels. Concepts of Fair Trade. Stockists / Wholesales, determination of Prices and Rate of Normal Profit / Meeting of Losses. Price Mechanism and State Role in Regulation of Markets.

The Modes of Financing In Islam

Modarba and Musharka, Types of Bai. (Bai-Salam, Bai Muajjal, Morabaha.) Saving and Investment in Islam. Investment of Savings for Gains.

Distribution in Islamic ECOomy

Islamic Stress on Circulating of Wealth. Steps against Concentration of Wealth. Social Justice in Islam. Rights of Labour, Distributive Justice. Use of Land and Other Natural Resources and their Rewards. Role of State in Distribution of Wealth.

Some Basic Macroeconomic Concepts

Consumption, saving and Investment Functions in Islamic Environment. Determents of Islamic Consumption Function, Concept to Help others, Welfare and Religious believes. Zakat and Usher.

Demand and Supply of Money and Banking

Gold Money, Paper Money and Credit Money. Western Justification of interest. Islamic Concept of Riba, its Implications and Alternatives. Functions of Commercial Banks in Islamic Framework., Central Banking and Monetary Policy in Islamic Framework.

Central Banking and Monetary Policy in Islam, Inflation Vs. Design of Capital Market. Monetary Policy in an Islamic Framework.

Zakat, Social Justice and State

Meaning of Zakat, Nisab, Introductory Hints about items of Zakat. Distributive Role of Zakat and Social Justice. Zakat as a tool in Fiscal Policy. Economic Role of Islamic State. Welfare consumption and limits. Revenue and Expenditure Items in Modern Islamic States. Beneficiaries of Zakat. The Tax Policy of Islam. Nature and Scope of Fiscal Policy in Islamic State (Taxation Policy). Expenditure Principles. Burden of Taxes.

The Islamisation Process In Pakistan

The Islamisation of Banks. Implementation of Zakat / Usher in Pakistan. A brief Survey of Changes in ECOomic Structure and Conditions Since the Holy Prophet (regarding Transport / communication, Business Forms, Production of Goods, Money and Banking).

New Emerging Issues and Challenges

Current Situation and Proposed Changes. Islamic View of International ECOomic Institutions and Modes of International Cooperation. Islamic View of Globalization. Quality Identification of Goods, Merits and Trade. Fair Prices Vs. Market Price etc.

Books Recommended:

Basic Texts:

1. Islamic Economics: Theory and Practice, A Comparative Study, M.A. Mannan, Cambridge, Hodder and Stoughton, 1986 (or latest ed.)
2. Islamic Economics: Dar A.H & M.. Akram Ilmi Kitab Khana, Lahore (latest ed.)
3. Macro Consumption Function in an Islamic Economic Framework, M. Fahim Khan, International Centre for Research In Islamic Economics, King Abdul Aziz Univ, KSA.

ECO-653. ECONOMETRICS-I 3(3-0)

Introduction

Definition and scope of Econometrics, Econometric models vs. Statistical models Ingredients of Econometrics modeling Specification, estimation, verification or evaluation and forecasting.

The Classical Linear Regression Model

The Simple Linear Regression Model (SLRM)

Estimation of SLRM by Ordinary Least Squares (OLS); Interpretation of Estimated Coefficients and their Economic Meanings.

The Multiple Linear Regression Model (MLRM)

Estimation of MLR model by OLS and its assumptions, Interpretation of estimated coefficients and their Economic meanings, Computation of elasticities and standardized coefficients, Using R^2 as a measure of 'Goodness of Fit' and some problems with its use.

The General Linear Regression Model (GLRM)

Estimation of GLRM by OLS through Matrix Approach, Var-Cov matrix of estimated coefficients.

Evaluating an Estimated Linear Regression Model

Testing the significance of individual coefficients. Testing the significance of the model as a whole.

Multicollinearity

What is Multicollinearity? Distinction between perfect Multicollinearity and less than perfect Multicollinearity (Multicollinearity problem). Consequences of Multicollinearity problem, methods for detection of Multicollinearity problem. Remedial measures for Multicollinearity problem.

Heteroskedasticity

What is Heteroskedasticity and what are its causes? Consequences of Heteroskedasticity for OLS estimation. Methods for detection of Heteroskedasticity. Remedial measures for Heteroskedasticity.

Autocorrelation

What is Autocorrelation and its Causes? Consequences of Autocorrelation for OLS estimation. Methods for detection of Autocorrelation. Remedial measures for Autocorrelation.

Forecasting with a Single Equation Regression Model

What is forecasting and what are its various types? Important features of a good forecast. Variance of unconditional forecast error. Variance of conditional forecast error. Measures for evaluating the forecasting power of a model.

ECO-656. ECONOMETRICS-II 3(3-0)

Errors in Variables, Time as a Variable, Dummy Variables, Grouped Data, Lagged and Distributed-Lag Variables

Errors in variables. Time as a variable. Dummy variables. Estimation from grouped data. Exogenous lagged variables. Endogenous lagged variables. Methods of estimation of lagged models.

Identification

The problems of identification. Implications of the identification state of a model. Formal rules for identification. Identifying restrictions. Tests for identifying restrictions. Identification and Multicollinearity.

Simultaneous Equations Models

Why Simultaneous Equation Models? Various Types of simultaneous equation Models. The identification problem. Checking the identification state of a model or of a particular equation in the model by Order Condition, bogus equation and reduced form approaches. Identification and methods of estimation.

Consistent Estimation of Parameters of Simultaneous Equations Models

Indirect Least Square Estimation. Two-stage Least Squares Estimation. Instrumental variables method of estimation.

Varying Coefficient Models:

Causes of Coefficient Variation. Randomly Varying Coefficient Models. Systematically Varying Coefficient Models.

Time Series Econometrics

ARIMA Models. Comparison of forecasts based on ARIMA and Regression Models. Unit Roots and Co-integration. Dummy Trap and its detection.

Suggested Books:

1. Gujarati, D. latest edition ,Basic ECOometrics , 3rd Edition, " McGraw Hill, 1993
2. Koutsoyiannis, A.(latest edition).Theory of ECOometrics, McMillan
3. Maddala, J.S. and Lahirir,K. 2009.introduutory Econometrics (4th edition , John Wiley and Sons.
4. Madnani, G.M.KIntroduction to ECOometrics Principles and Applications, (Latest Edition),
5. Rubinfeld, Edition, McGraw Hill Inc. 1992.
6. Maddala, J. & Kim Unit Roots, Co-integration and Structural Change, Cambridge University Press, 1998.

Overview of Pakistan Economy

Development Experience, Approaches, Policies and Outcomes. Identification of Issues: The era of 1950's, 1960's, 1970's, 1980's 1990's and 2000's. Structural Change and Sources of Growth. Emergence of Economic Issues, Human Resource Development, Unemployment, Poverty, Income Distribution, Debt, Deficit etc. Growth with limited development in Pakistan.

Development Planning and Resource Mobilization

Agricultural Development Policies and Priorities, Major Targets of Develop Plans and Emerging Issues; Neglects and Successes: Mobilization of Domestic Resources; Shortages, Deficits and Role of Foreign Aid. Agricultural Vs. Industrial Development Debate. Agricultural Adequacy.

Agriculture and Industrial Development: Emerging Issues

Pattern of Agricultural and Industrial Development, Land Reforms and Its Impacts, the Role of Green Revolution and its Impacts: Present Status. Agricultural Price Policy and Income Tax. Sectoral Terms of Trade. Industrial Development Policies and Strategies. Development of Large and Small Industries. Value Added: Manufacturing Goods Vs. Primary Goods Production. Agriculture Vs. Industry: Development Debate.

Sectoral Development, Employment Pattern and Unemployment

Sectoral Priorities and Development Issues. Human Resource Development and Emerging Issues: Population Growth, Labor Force Participation Rate and Employment Pattern, Unemployment and Underemployment, Forecasting Manpower Needs and Employment. Strategies to combat unemployment. Criteria to Measure Unemployment / Underemployment: Time Criterion, Productivity Criterion and New Index of Unemployment: Application to Pakistan and Empirical Evidences. Good Governance, Social Action Plan and its Impact. Role of Institution in Development. Social Sectors development Vs. High Return Sectors: Growth trade off.

International Debt and Dependency

Concepts of Foreign Aid and Debt. Borrowing Vs. Domestic Reserve Mobilization (failure). Size of Foreign Debt, Debt Saving and its Impacts. Strategies to combat with High Debt: Saving Policy, Foreign Trade Promotion, Cutting non-development Expenditures, Rescheduling and its Impacts. Debt Management in Pakistan and Its Impacts. Debt Modeling and Future Implications.

Poverty and Income Distribution

Pattern of Income Distribution: Rural and Urban. Definitions and Approaches to Measure Poverty: Income Approach, Expenditure Approach, Basic Needs Approach, Poverty of Participatory Index (POPI). How to Combat Poverty; Growth Strategy, Basic Needs, Labor Intensive Investment: Education / Training etc. and Social Action Plan (SAP), its Role and Critical Review, Evasion of Policies / Strategies to Combat Poverty and Improving Income Distribution: Critical Evaluation. Neglect of Human Resource Development. Child Labor. Factors Productivity Issues.

Inflation, Foreign Trade Deficit and Emerging Issues

Sources of Inflation in Pakistan. Policies to Combat Inflation and their Impacts. Trade Performance, Instability and its Impacts. Policies to Combat Deficit and Trade Instability. WTO and Its Impacts. Reforms and Further Needs. Expected Impacts of WTO and Challenges. Terms of Trade Issues, Market Access and Health Related Rates.

Recommended Books:

1. Aslam M., Perspective on Development Planning In Pakistan, Allied Book Centre, Lahore, 2001-2002.

2. Chaudhary M. A. and Ahmad E. 2004. Globalization, WTO and Trade Liberalization in Pakistan, FerozSons, Lahore (2004).
3. Hussain, I. 1988. Pakistan: The Economy at the Cross Roads – Past Policies and Present Imperatives, Oxford Univ. Press, Karachi,
4. Khan, S. 2000. 50 Years of Pakistan's Economy – Traditional Topics and Contemporary Concerns. Oxford Univ. Press, Karachi
5. Mahbub-ul-Haq Centre for Human Development (MHCHD), Poverty Profile of Pakistan, (1989) Oxford University Press.

ECO-654. INTERNATIONAL ECONOMICS 3(3-0)

A) International Trade Theory

Importance and Bases of Trade

Why Study International Economics? The Changing World and Interdependence: Basis of Trade, Gains from Trade. Absolute Advantage, Comparative Advantage, Overview of Comparative Advantage and Pattern of Trade. Offer Curves and Free Trade Equilibrium.

Growth and Trade

International Trade and Shift in Production Function, Immersing Growth, Output Growth and Terms of Trade (T.O.T) / Deterioration: Uniform Growth at given T.O.T.

Technology and Factor Endowment

Ricardian Trade Model, World Production and Gains. Comparative Cost and Trade Pattern. National and World Gains from Trade. International Wage differentials and Productivity. Technical Progress and International Gains. WTO and Gains from Technical Progress: Impacts on Prices. Equilibrium Production and Consumption: Non-traded and Tradeables, Costs, Marginal Physical Product and Production Possibilities. Production Possibilities with Diminishing Returns, Increasing Opportunity Cost. Free Trade and Income Distribution, Relative Demand, Supply and Pattern of Trade. Dutch Disease and its application.

Factor Endowment and Heckscher – Ohlin Theory

Output and Factors Rewards in 2*2 Model. Factor Intensity Comparison. Heckscher- Ohlin (H.O) Model, The Role of Demand, Factor's Prices and Commodity Prices, Factor Price Equalization, and Factor Intensity Reversal. The Product Cycle, Critical Analysis of Traditional Trade Theories. Rypecksy Theorem and its critical review.

Tariff, Quota and Trade Policies

Tariff and Small Country: Effects of Tariff, Price and Demand for Imports, Welfare impacts. Impacts of Tariff on Government Revenue, T.O.T Production and Welfare. Impact of Tariff on Domestic and World Welfare. The Optimal Tariff. Tariff and Distribution of Income. Brief Introduction of Tariff and WTO Laws, Tariff and Second Best Choice, Subsidies and Quota, Voluntary Quota, Growth with Protection vs. Free Trade Gains and WTO. Monopoly and. Dumping / Discrimination and WTO, Competitiveness and Market Share, Managed Trade, Quantitative Restrictions, Voluntary Export Restrictions and Their Impacts. Trade Diversion and Preferential Arrangements. WTO Rules: Sanitary, Phytosanitary, Dumping, Anti-Dumping etc Rules and Emerging New Issues and Their Impacts.

B) **International Monetary Economics and Finance**

Foreign Exchange Market and Exchange Rate Determination

Foreign Exchange Rates (F.E.R): What it represents? Real, Nominal and Effective Rates. Determinants of Foreign Exchange Rate. Efficient F.E.R Market. Dynamic Theory of Interest and Exchange Rate. The Theory of Spot Exchange Rate Determination. Capital Flow and

Speculations. Forward Exchange Market, Interest Arbitrage, Interest Parity Theory, Speculators, Hedgers and Traders.

Purchasing Power Parity, Exchange Rates and Balance of Payments (B.O.P)

Purchasing Power Parity (PPP): Non-Trade Goods, Balance of Payment Effect. Test of Exchange Rate Instability. Impacts of F.E.R. Rate Instability. B.O.P: Income Absorption Approach to B.O.P. Elasticities of Exports and Imports and Impact on B.O.P. The Marshall-Lerner Conditions. Monetary Approach to B.O.P.

Open Economy: Monetary and Fiscal Policy

Monetary and Fiscal Policies: Internal and External Balance. Monetary and Fiscal Policy with Fixed Exchange Rates. Problems of Small Country: Fixed Exchange Rate, Free Floating Exchange Rate, Managed Exchange Rate and Critical Review of The Fiscal – Monetary Mix Models.

International Movements of Factors and Welfare: Impacts / Issues

Gains from Migration. WTO and Factor's Movements and the Commodity Movement. Facts on International Capital Flow: ASEAN Crisis and Role of International Institution and Criticism. Motive for Capital Movement: Return and Risk Diversification. Why disagreement on International Movement of Labour? Welfare Impacts of Labour Movements. Factors of Production and Price Equalization Issues. Multinationals Firms and Foreign Direct Investment, Transfer of Capital, Technology, Skill and other Gains, Transfer of Resources and Transfer Problem.

International Institution: Trade, Capital and B.O.P.

Introduction of International Institutions, Role and Major Activities of IMF. IMF Credit Facilities. Loan Mechanism, Value of SDRs. The Optimum Quantity of Reserves, Optimum Interest Rate. Euro-Dollar, Dollar Exchange and Impacts. Role of IMF in B.O.P Support and Stabilization. WTO Rules: Sanitary, Phytosanitary, Dumping, Anti-Dumping etc Rules and Emerging New Issues and Their Impacts.

Basic Readings:

1. Salvatore, D. 2007. International economics, 9th edition, Wiley
2. Appleyard, R.D., Field, A.J. and Cobb, S. 2009. International Economics, Trade, theory, and Policy, 3rd edition, Richard, D.
3. Chacholiades, Miltiades, International Trade Theory and Policy (Latest Edition). McGraw Hill Book Company, New York, London.
4. Sodersten B. & Geoffry, R., (1994). International ECOomics, MacMillan Press Ltd.
5. The Global Competitiveness, Report 1999, World ECOomic Forum, Oxford University Press, Oxford, New York.
6. World Bank. World Development Report, 1986. Oxford University Press.

Additional Readings:

1. Baldwin, R. L. and Richardson David J., (1986). International Trade and Finance, Little Brown and Company, Boston, Toronto.
2. Moran T. H., (1985). Multinational Corporations: The Political ECOomy of Foreign Direct Investment. Lexington Books. Toronto, Massachusetts.
3. Krugman, P.R. and Obstfeld, M. 1998. International Economics: Theory and Policy, Addison-Wesley Longman, Inc. New York.

ECO-652. DEVELOPMENT ECONOMICS 3(3-0)

Note: Students are expected to study latest editions of the recommended books. At least two research papers pertaining to each topic must be comprehended. Each topic must be prepared and analyzed critically. Any aspect of the topics may be asked in the examination. The course content provides a guideline. Students must prepare critical review of topics.

Part: A Theoretical Foundations and Sector Specific Issues:

Scope and New Developments

Definitions: Economic Development and Growth, Identification of Development variables. Scope and Significance of Development Economics. Characteristics of LDC's. Measurement of Economic Development and Growth. Per Capita Income approach, Quality of Life Index / HDI etc. Historical overview of world development and emerging major issues pertaining to Less Developed Countries (LDC's). Why the whole world is not developed?

Major Theories of Development

Classical and Neo-classical Theories, Adam Smith and Competitive Capitalism, Vicious Circle of Poverty, Stages of Economic Growth, Balanced and Unbalanced Growth, Big Push Theory. Dependency Theory, Structuralist's View Point. Endogenous Growth Theory: New growth Theory. Income Convergence/ Divergence, New Growth Theory. Market Friendly Approach.

Agriculture and Industry

Agriculture vs. Industry: Development Debate. Lewis' Model of surplus Labor. Rains' Fei Model and its critical review. Transforming Agriculture, Underemployment problem. Role of Agriculture: Market for Industrial Output, Provision of Input, food, Complementarity, productivity growth. Terms of Trade Issue and Subsidies, etc. and Competitiveness. Land Holdings, Green Revolution and its Performance. Need for Industrialization. Industrialization and its financing mechanism. Problem of Sectoral Dualism. Why Green Revolution? The Spread of Green Revolution in Pakistan and its Status / Contributions.

Population, Education and Human Capital

Demographic Transition, Human Resources as a source of growth and their contributions. Investment in education and returns. Models of Employment & Unemployment: Time Criterion, Productivity Criterion and New Index etc., and Employment generation Strategies/Techniques.

Part B: International Development Issues and Debates

International Debt, Aid / Assistance

Why international borrowing? Two Gap Model, Aid commitments and disbursement. Sources of borrowing. Debt Cycle Theory/Stages. Debt Burden: Debt Servicing, Debt laffer Curve, Debt buy back etc., Latin American Debt Crises, ASEAN Crises, Debt Problem of LDC's and South Asia, Debt Overhang and threat to growth. Policies to combat debt problem: Forecasting debt and solution for debt burden, saving mobilization/Domestic resource mobilization, Debt rescheduling etc. Debt Modeling and Forecasting Future Implication.

WTO, Liberalization and International Trade

Trade vs. Aid. Liberalization of Trade and its impacts/gains etc., Foreign Exchange Constraints and Balance of Payment deficit. Role of GATT and its Failure. WTO and LDC's. Trade Instability, Distribution of gains from Trade liberalization. Regional Trade Associations (RTA's): their role and contributions. Basis for trade and benefits: Gains from Trade: Static and Dynamic Gains. Comparative Advantage, Revealed Comparative Advantage and Competitiveness. Trade as an engine of growth. Product Cycle. Determinants of exports growth. Transfer of Technology: Sources & Need. Technology Centered Development and Appropriate technology issue.

Transnational Corporations (TNC'S), FDI and Development

Transnational Corporations (TNC's): Objectives, Role and Contributions, Long term cost of TNC's. Transfer of Technology: Ways and Means. Global integrated production system:

TNC's and Globalization, Foreign Direct Investment (FDI) and Its Determinants/Role. Foreign Direct Investment (FDI) and TNC's. Flow of FDI and its contributions.

Poverty and Income Distribution

Definitions and Measurement of Poverty/Poverty Line. Poverty concepts/definitions. Absolute Poverty, Relative Poverty, Income approach, Expenditure approach, Basic needs approach, Poverty of Opportunities Index (POPI) and Calorie-based approach etc. Poverty Indicators. Poverty by socio-Economic groups. Sources, impacts and policies to combat poverty. Strategies and tools to combat poverty. Growth and Income Inequality in the world. Empirical evidences on poverty. Redistribution with growth. How to combat income inequality. Basic Needs, Social Action Programs and Poverty alleviation.

Environment and Development

Model of Environment and Economic Activity. Market Based Approach and Externalities. Deforestation and Renewable Resources, Measuring environment values. Deforestation and Macroeconomic Environment. Industrialization and its environmental cost, Use of Pesticides and Environmental Impacts. Natural resources degradation. Cost of Pollutions/Environmental degradation. International awareness about environment, production and need for Reforms. Economic thoughts and Environment. International Agencies: Environmental concerns and programs. Urbanization and environmental issues. Sustained development, Ecology and Economic progress.

Growth Models

Harrod-Domer Model, Technical Change and growth Model, Kaldor's Model of Distribution, Joan Robinson's Model of capital accumulation, Model of Steady State Growth. Saving-Investment and Golden Rules.

Recommended Books:

1. Todaro M. P., *ECOomic Development in the third World. Latest Edition, Heinemann, London.*
2. Ghatak, S., (2003), *Introduction to Development ECOomics, Routledge, Taylor and Francis Group, London/New York.*
3. Herrick B. and Kindleberger C., (latest eds.). *ECOomic Development. McMillan, New York.*
4. Jones H. G., *An Introduction to Modern Theories of ECOomic Growth, (Latest Edition), McGraw Hills.*
5. Mahboob-ul-Haq Center for Human Development (MHCHD). *Human Development in South Asia, Annual Reports, Islamabad.*
6. Meier Gerald M., *Leading Issues in ECOomic Development, (Latest Issue), Oxford University Press.*
7. Thirlwall, A.P., (2003), *Growth and Development, With Special Reference to Developing ECOomies 7th edition, Palgrave Publisher.*
8. Van Den Berg H., (2001), *ECOomic Growth and Development,* McGraw Hills.*
9. World Bank, *World Development Reports, Annual reports, 1986, 1987, 1990, 1991, 1992, 1994, 1995, 1998/99, 2000/2001 and 2004.*

ECO-658: COMPUTER APPLICATION IN QUANTATIVE ANALYSIS IN ECONOMICS 3(3-0)

Introduction to Windows 2000 and Ms-Word

Operating System, Performance Management, Desktop Management, Printer Management, Internet Explorer, E-mail. MS-Word, using Advanced Formatting Features, Sharing data with Word, Word Macros, Composing Models and Mathematical Equations.

PowerPoint and MS-Access (XP)

Database Concepts, File Linkages, Data Retrieval, Data Editing / Updating. Data Transferring.

SPSS and E-View

Menu, Tool Bars, File Linkages, Dialog Boxes. Data Analysis, Analysis of Variance. Simple and Multiple Regression Analysis, Formatting Reports, Creation and Modification of Chart, Line Area and Pie Chart. Output Navigator Printing, Data Editor Printing, Command Syntax Printing. Use of E-view for Model Estimation.

Estimation of Production Function

Use of Computer, SPSS, E-View to Estimate Production Functions. Cob-Douglas Production Function, Constant Elasticity Production Function etc.

Computer Applications: Demand – Supply & Equilibrium

Estimation of Demand and Supply using E-View / SPSS. Aggregate Demand – Aggregate Supply and Equilibrium.

Model Building and Estimation

Building Simple Econometrics Models and Estimation. Single Equation Models, Multiple / Simultaneous Equation Model. Interpretation of Computer Output.

Project Appraisal and Computer Application

Use of Computer Programming (Softwares), E-View etc. for Cost-Benefit Analysis, Estimation of Present Values, Estimation of Economic and Social Benefits. Project Appraisal Using E-View etc. Estimation of Cost Functions and Decision Making.

Econometrics Analysis and Computer Applications

Regression Functions. Estimation with Qualitative Variables Confidence Interval and Hypothesis Testing. Estimation and Improving Model Estimates: Autocorrelation, Estimation of Simultaneous Equations. Estimation of VAR and ARIMA Models.

Recommended Books:

1. E-View Manual, (Learning help available with package (software)).
2. Robertson, D.F., Computer Applications and Programming, Har Brace Jovanovich Inc. USA (latest edition).
3. SPSS-Manual.
4. Stata manual.

OPTIONAL COURSES

ECO- 662 : AGRICULTURAL ECONOMICS 3(3-0)

Introduction and Importance of Agriculture

Agricultural Revolution, Importance of Agriculture, Food Safety, Agriculture vs. Industrial development Debate. Current State of Agricultural Development. Brief Overview of Sources of Growth. Introduction to issues in Agriculture etc.

Structure and Characteristics of Agriculture in LDCs

Traditional Agriculture and Productivity. Access to non-labor resources. The Framing Environment: Natural Hazards and Economic Uncertainties. The Food problem. Farm Size and Productivity. Farm Size in Pakistan and Productivity Commercial Farms. Impact of Agricultural Reforms on Farm Size.

Role of Agriculture in Economic Development

A framework of Analysis. Product Contribution, Market Contribution, Factor Contribution. Foreign Exchange Contribution. Agriculture vs. Industry Debate of Development.

Theory of Rent and the Concept of 'Surplus'

Introduction. Economic Rent. The Theory of Rent. Rent and Quasi-Rent The Ricardian 'Corn Rent'. The Rental Market. Agricultural Surplus. Characteristics of Landownership in Underdeveloped Agriculture and Pakistan. The Theory of Share Tenancy. Some Extensions of the Share Tenancy Model. Tenurial Status in Pakistan. Agricultural productivity in Pakistan and use of inputs.

Agriculture in Dualistic Development Models

Introduction. The Lewis Model. The Ranis-Fei(FR) Model. The Jorgenson Model. Kelley, Williamson, Cheatham Model. Criticism : Dual Economic Models. Agricultural Adequacy; Mellor's Model.

Resource Use Efficiency and Technical Change in Peasant Agriculture

Efficiency of Resource Utilization. Technological Change in Agriculture. Generation of new Agricultural Technology. Factor-biased Technological Change and its Distributional Consequences. Agricultural Technical Change and Agricultural Employment: Empirical Evidences. Agricultural Resources and Technical Change in LDCs: with Special Reference to Pakistan.

Supply Response

Introduction. The Cobweb Model: An Illustration. Price-Supply Response in Backward Agriculture. A simple Supply Response Model. Supply Response in the Underdeveloped Agricultural labour Market, Specifically in Pakistan. The Concept of 'Marketed Surplus': Some Methods of Estimation. Some Criticisms of Krishna's Method and the Alternative Approach of Behrman Perennial Crops and Marketed Surplus in Pakistan. Green Revolution in Pakistan and Responses. Present Status of Green Revolution in Pakistan: Empirical Analysis.

Institutional Constraints and Remedial Policies

Inequitable Landownership and Land Reform. Capital and Finance in Underdeveloped Agriculture. Marketing Imperfections and Marketing Policy in Pakistan. Measures to Improve Marketing System in Pakistan. Support Price Policy in Pakistan. Determinants of support prices. Impacts of support prices.

Population and Food Supplies

The Classical Model. Contra-Malthusian Model. Ecological Disequilibrium. Synthesis of Population and Food Supply Theories. Malnutrition in Developing Countries like Pakistan and Remedial Measures. Choice of Planning Strategy for Agriculture Development, Agricultural Project Planning.

Agriculture and International Trade

Main Features of Trade in Agricultural Goods. Trade Policies in Developed Countries and their Impacts. Welfare Gains from Price Stabilization. Terms of Trade Issue. A Survey of the Literature. Some Measurement Problems. Prebisch's Hypothesis. The Agricultural Self-Sufficiency Argument in Developing Countries like Pakistan. Cartels in Commodity Trade and Welfare Gains and Losses. Integrated Commodity Agreement (ICA) Schemes. The Compensating Financing Schemes in Pakistan. Impact of Policy Measures on Primary Product Trade of Pakistan. Few agricultural goods production and exports to few markets ; Issues and problems of instability in exports. WTO and its implications for Pakistan's agriculture, with special reference to quality, dumping, subsidies, State Trading, Sanitary and Phytosanitary rules and marketing rules etc. Subsidies and Developed Countries.

Suggested Readings:

1. Capstick, M. The Economics of Agriculture, London George Allen Unwin Ltd., latest edition.

2. Ghatak S., and Ingersent K., Agriculture and Economic Development, (Latest Edition), Harvester Press.
3. Johnston, Bruce, F & Fellir Kily. Agricultural and Structural Transformation, Economic Strategies in late Developing Countries.
4. Shafi M., (1995), Pricing of Farm Produce in Pakistan, Objectives, Practices, and Experiences. Print Associates International, Islamabad.

ECO - 664 : MANAGERIAL ECONOMICS 3(3-0)

Nature, Scope and Overview of Managerial Economics

The Nature and Scope of Managerial Economics. The Managerial decision making process. Theory of the firm. Profit maximization, Cost Minimization. Economic optimization. Economic relations of variables. The Incremental concept in Economic Analysis. Demand, Supply and Equilibrium.

Demand Analysis, Estimation and Forecasting

The Basis for Demand. The Market Demand function. Demand sensitivity analysis: Elasticity, Price Elasticity of Demand with Managerial applications. Income Elasticity of Demand with Managerial applications. Application of Regression Analysis: Demand estimation. Demand forecasting.

Production and Cost Analysis

Production functions. Total, Marginal and Average Product. Revenue and Cost in Production. Production function estimation. Productivity Measurement. Homogenous and Homothetic Production Function. Short run and long run cost curves. Learning curves and application. Cost-value-profit analysis. Cost estimation.

Linear Programming

Production planning for a single product Production planning for a multiple products. Graphic specification and solution. Simplex method of solution. The dual in linear programming. Shadow prices in linear programming.

Decision Making Under Risk and Uncertainty

Introduction. Risk Analysis of Decision Alternatives. Adjustment for Risk in Decision Making. The Expected Value Criterion. The Standard Deviation Criterion. The Coefficient of Variation Criterion. The Certainty Equivalent Criterion. The Maxima and Maximax Criterion. The Decision Tree and Joint Probabilities. Optimal decision Strategy. Limit Pricing and Preventing entry.

Pricing Analysis and Decisions

A Review of Market Structures and Basic Pricing Models. Perfect Competition. Monopoly. Monopolistic Competition. Oligopoly. Selected Pricing Models. Marginalist Pricing. Mark up pricing. New Product Pricing. Oligopoly Model. Contestable Markets. Pricing Strategies for Firms and Market Power. Monopolistic Competition. Price Discrimination, Monoposony and Price Product.

A Critique of Traditional Theory of the Firm

Full Cost Pricing Model. Mark-up Pricing Model. Problem fro Marginal Price-formula. Limit Pricing Models.

Managerial Theories and Models of the Firm

Baumol's Theory of Sales Revenue Maximization. Marris's Model of Managerial Enterprise. Williamson's Model of Managerial Discretion Topics, Behavioral Model by Cyert and March.

Public Sector Production and Pricing of Goods.

Public and Private Goods and their pricing mechanism. Decreasing cost Industry and pricing. Externalities and Market Pricing issues. Rent seeking and control. Government Policy and International Trade, tariff and pricing. Import Competitiveness and tax, International pricing Techniques / Strategies.

Capital Budgeting and Investment

Pre-requisites of Capital Budgeting. Investment Criteria and Decisions. Cash flow estimation, Internal Rate of Return, Profitability-Index Criterion and other criterion. Optimal Capital Budget.

Suggested Readings: (Books):

1. Hirschey, M. *Managerial ECOomics*, (10th edition) U.S.A. Thomson South-Western, (2003).
2. Hirschey, M. and J.L. Pappas; *Fundamentals of Managerial ECOomics*, Dryden Press, (1998).
3. Kent P, and Young, P. 2003. *Managerial ECOomics: ECOomic Tools for Today's Decision Makers.*, (4th Edition) Pearson (2003).
4. Salvatore, D.2001. *Managerial ECOomics*, McGraw Hill, (2001).
11. Thomas, M.2002., *Managerial ECOomics: In a Global ECOomy* (7th Edition) New York: McGraw Hills, (2002).

Suggested Readings (Articles):

1. Goering, G. E. "Managerial Style and the Strategic Choice of Executive Incentives." *Managerial & Decision ECOomics* 17 (January/February (1996))., 71-82.
2. Chevalier, J.A., and Scharfstein, D.S. "Capital-market Imperfections and Countercyclical Markups: Theory and Evidence." *American ECOomic Review* 86 (September; 1996): 703-725.

ECO-666: GENERALEQUILIBRIUM AND WELFARE ECONOMICS

The nature of general equilibrium analysis, General Equilibrium Theory: Multi market equilibrium in a competitive setting; Walras Law; Existence of equilibrium; Stability of equilibrium; Money in a general equilibrium setting. Technical and allocative efficiency and case of exchange economy. Linear programming technique to general equilibrium theory (Activity Analysis). The Von-Neuma Model of a expanding economy, The input-out Model. Pareto principle, optional, production and resource allocation and efficiency of Perfect Competition. Measurement of Changes in Welfare: Consumer Surplus, Compensation Principle. The Theory of Social Choice: Social welfare function, Arrow's Impossibility Theorem, Marginal cost pricing, Joint Products, Externalities, Income distribution and compensation principles. Theory of second best and its application in Public Sector and international trade.

Recommended Books

- Mas-Colell, Whinston and Green, *Microeconomics Theory*, Oxford University Preses, 1995. Other Reference Books for general equilibrium.
- Arrow and Hahn, *General Competitive Analysis*, San Francisco, Holden-Day 1971.
- Jehle, G.A., & P.J. Reny, *Advanced Microeconomics, Theory*, Addison Wesley, 2001 (2nd ed.)
- Varian, H., *Microeconomics Analysis*, Norton 1992 (3rd ed)

ECO-668: LABOR ECONOMICS

- Topic 1: Importance of Labor Economics**
Introduction: Industrialization and Emergence of Labor Economics. Tools to Analyze Labor Markets and Conditions. Overview of Labor Issues in Developing and Developed World.
- Topic 2: Labor Markets Analysis: Demand for Labor**
Labor Market Indicators, Demand for Labor, Decision Making and Labor Hiring. Labor Migration: Reasons and Impacts. Demand for Labor by Firms, Short Run and Long Run Demand for Labor, Industry and Market Demand.
- Topic 3: Labor Market: Supply of Labor and Wages**
Determinants of Labor Supply. Concepts of Human Capital, Human Capital, Productivity and Wages. The Determinants, Labor Force Participation. Supply of Labor and Household Productions. Labor – Skill, Training and Productivity. The Dual Labor Market Theory. Labor Unions and Wages. Supply and Demand for Labor and Wage Determination. Backward bending Supply Curve of Labor.
- Topic 4: Wages, Unemployment and Inflation**
Determinants of Wages, Market Determination of Wages and Marginal Productivity, High Wages and Involuntary Unemployment. Stagflation and Unemployment, Structural Adjustment and Wages. Major Sources of Unemployment, Wages and Phillip Curve. Wage Rigidity, Labor Unions and Unemployment. Unemployment and Social Protection.
- Topic 5: Labor Market Discrimination**
Discrimination in Labor Market: Gender, Race and Ethnicity. Efficiency Wage Theories and Coordination Failure.
- Topic 6: Labor Market Information System**
Labor Market Information System and Efficiency, Labor Statistics and Labor Policy. Human Welfare and Labor Policy, Minimum Wages, Rationale and Impacts.
- Topic 7: Theories of Labor Movements**
The Marxist, The Wells, Selling and Pearlman’s contributions. Trade Unions in Pakistan, Labor Legislation in Pakistan. Impacts of Labor Union. Labor Policies in Pakistan: Critical Evaluation.
- Topic 8: Child Labor**
Definition and extent of child labor. Child labor; moral aspects. Child labor an international issue: Extent of Child labor in developing countries. Child labor in Pakistan. Policies to combat child labor. Child labor and international trade issue.

Reading List:

1. Comith Stephen, (2003), Labour Economics, Routledge Publishers.
2. Bruce, Kaufman; e. Kaufman, Julie L; Hotchkiss, (2002), Economics of Labour Markets, Thomson Publisher.
3. Current Issues in Labour Economics, (1989), Palgrave Mcmillan.
4. Reynolds, Labor Economics and Labor Relations.
5. Orley, Ashenfelter (edt), Layard, P. R. G., (edt), Hand Book of Labour Economics, Elsevier Science Pub. Co. (1986).

ECO-670: ADVANCED MATHEMATICAL ECONOMICS

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- Topic 1: Complex Number and Circular Functions**
Imaginary and Complex Numbers. Complex Roots. Circular Functions. Properties of Sine & Cosine functions. Euler Relations. Alternative Representation of Complex Numbers.
- Topic 2: Integral Calculus**

Dynamics and Integration. The Nature of Indefinite Integrals, Basic Rules of Integrations & Rules of Operation. The Substitution Rule and the Rule of Integration by Parts. Definite Integrals. Major Properties of Definite Integral. A Definite Integral as an Area Under a Curve. Improper Integrals. Economic Applications of Integrals – Finding Total Functions from Marginal Functions, Investment & Capital Formation, Present Value of Cash Flow. Present Value of a Perpetual Flow, Domar Growth Model.

Topic 3:

Differential Equations: Continuous Time:

First Order Linear Differential Equations

Meaning and Definition; Homogenous & non-Homogenous Cases. Solution of First Order Linear Differential Equation with Constant Coefficient & Constant Term and its Verification. Economic Application: Dynamics of Market Price. Solution and its Verification of First Order Differential Equation with Variable Coefficient and Variable Term. Exact Differential Equation, its Solution and Verification. Non-linear Differential Equations of the First Order and First Degree. Bernoulli Equation, Separable Variables. The Qualitative Graphic Approach. Concept of Phase Diagram, types of Time Paths and their Dynamic Stability. Economic Application: Solow Growth Model.

Topic 4

Differential Equations: Higher Order Differential Equations

Solution and Verification of Second order Linear Differential Equations with Constant Coefficient and Constant term-Distinct Real Roots, Repeated Real Roots and Complex Root Cases. Dynamic Stability of Equilibrium. Economic Applications. A Market Model with Price Expectations. The Interaction of Inflation and Unemployment. Solution of Higher order Differential Equations with Constant Coefficient and Constant Term. Convergence and the Routh Theorem.

Topic 5:

Difference Equations; Discrete Time:

First Order Difference Equations

Solution and its Verification of First Order Difference Equations. The Dynamic Stability of Equilibrium. Economic Applications – The Cobweb Model, A Market Model with Inventory. Nonlinear Difference Equations – The Qualitative-Graphic Approach. Phase Diagrams Types of Time Path. A Market with a Price Ceiling.

Topic 6

Higher Order Difference Equations

Solution and Verification of Second-Order Linear Difference Equations with Constant Coefficients and Constant Term-Distinct Real Roots, Repeated Real Roots and Complex Roots cases. The Convergence of the Time Path. Economic Applications, Samuelson Multiplier-Acceleration Interaction Model. Inflation and Unemployment in Discrete Time. Higher Order Linear Difference Equations and their Solutions. Convergence and Schur Theorem Again. The Solution of Simultaneous Differential Equations.

Topic 7:

Non-Linear Programming

The Nature of Non Linear Programming Non-Linearities in Economics. Kuhn Tucker Condition. Interpretation of Kuhn Tucker Condition. Kuhn Tucker Sufficiency Theorem: Concave Programming. Arrow Enthoven Sufficiency Theorem: Quasiconcave Programming. Economic Application-Utility Maximization, Least Cost Combination. Solving a Nonlinear Program via the Kuhn-Tucker Conditions.

Recommended Books:

1. Chiang A.C. Fundamental Methods of Mathematical Economics McGraw Hill (3rd Edition) 1984.

2. Dowling Edward T. Mathematics for Economics Schaum Series, 1981.
3. Glass Colin J. An introduction to Mathematical Methods in Economics McGraw Hill.
4. Haung David, S., Introduction to the set of Mathematics in Economic Analysis Graphical Approach, Simplex Method, Economic Application of linear Programming N-Y John Wiley and Sons, latest edition.
5. Hoy M., Livermois J, Rees R, Stengos T., Mathematic for Economics, 1996. Addison0Wesley Publishers limited.
6. Weber E. Jean, Mathematical Analysis, Business and Economic Application (latest edition), Harper and Row Publishers, New York.
7. Yamene, Taro, Mathematics for Economists, Prentice Hall, latest edition.

Additional Readings:

1. Allen R.G.D., Mathematical Economics, London, Macmillan English Language Book Society.
2. Edey & Peacock, National Income and Social Accounting London, Hutzchinson University Library, 3rd Edition.

ECO-672: PROJECT APPRAISAL AND INVESTMENT ANALYSIS

Topic 1: Introduction

Meaning of Project Appraisal, usefulness and significance, Aspect of project appraisal with a special focus on economic versus financial analysis, Contours and Dimensions of a project and its essential ingredients, Project Vs. Plans. Project Cycle.

Topic 2: Identify Project Benefits and Costs

Objectives of Costs and Benefits, The Incremental / Net Benefits and “With” and “Without” Comparisons. Categories of Costs and Benefits.

Topic 3: Pricing Project Costs and Benefits

Prices reflecting values, Market price and financial analysis, Finding market prices and related problems, Change in relative prices and inflation: Shadow Prices and economic analysis, Removal of market price distortions in traded and non-traded goods. Premium on foreign exchange through use of Shadow exchange rate and conversion factor approach.

Topic 4: Comparing Project Costs and Benefits (Measuring of a Project Worth)

Undiscounted measures of project worth, Discounted measures of NPW, IRR, BCR, Net benefit – Investment Ratio, Comparative assessment of discounted measures. Social vs. Economic benefits and selection of projects.

Topic 5: Applying Discounted Measures of Project Worth

Sensitivity analysis, Switching value, Choice among mutually exclusive alternatives, Domestic resource cost of foreign exchange earning / saving.

Topic 6: Cost Effectiveness Analysis

Areas and elements of analysis, Methods of analysis: Constant Effect Method, Constant Cost Method, Measuring of cost effectiveness, Present Worth, Annual Worth, Cross over discount rate, Limitation of analysis.

Topic 7: Financial (Investment) Analysis

Theoretical and empirical examination and saving and investment, Concept of capitalization types of securities, non-banking financial institution. Development financing, Asset Structure, Stock Prices, Money Market, Portfolio Theory and Investment Analysis. Financing the industrial sector; Large scale and small scale, Interest rate. Bond

market, Real and financial investment. Financial intermediaries; Speculation and Inter – relationship of financial and real variables in the economy.

Suggested References:

1. Hughes, A., & D.J. Storey: “Finance and The Small Firm” (Ed) Routledge, London, (1994).
2. Bruno Solnik, International Investment, Addison Wesley, (1996).
3. Bruno Solnik: “International Investments” 3rd Ed. Addison, Wesley publishing Co. (1996).
4. Donald, E., Fischer, Arnold, J., Security Analysis and Portfolio Management. Prentice Hall, Delhi, (1997).
5. Edwin J., Elton and Martin J. Gooper, Modern Portfolio Theory and Investment Analysis, John Wiley and Sons (1997).
6. Gittinger J. Price, “Economic Analysis of Agricultural Projects”, The Johns Hopkins University Press, London, Dec. (1996).
7. Hughes and Storey D.J., Finance and Small Firms, RoutLedge, London (1994).
8. Hussain, Ch. M: “Project Appraisal, Monitoring and Evaluation Process with Special Reference to Pakistan” Royal Book Co. Karachi, (1985).
9. Punjab P&D Board, “Planning Manual” Lahore, (1998).
10. United Nations: “Guide to Practical Project Appraisal – Social Benefit – Cost Analysis in Developing Countries.” Oxford & IBH publishing Co. New Delhi. (1978).
11. United Nations: “Manual for Evaluation of Industrial Projects” Oxford & IBH Publishing Co. New Delhi, (1980).
12. William F. Sharpe & Gorden J., “Investments” 5th Ed., Prentice Hall, (1996).
13. Zvi Bodie, Alex Kane, Alan K., Essentials of Investment, McGraw Hill, (1998).

ECO-674 DYNAMIC MACROECONOMICS

Construction and analysis of dynamic models of macroeconomics and monetary phenomenon with focus on non-linearity, multiplicity of equilibria, and indeterminacy; stability and instability of macroeconomic equilibrium in linear and non-linear models; continuous and discrete time; classical and Marxian accumulation models with multiple indeterminate, cyclical and chaotic equilibrium paths; non-linear stability bifurcation theory, dynamic stochastic optimization techniques. Disequilibrium models; price and quantity adjustments of multiple equilibria, stability in the long-run.

Recommended Books

- Blanchard O and S. Fisher, 1998, Lectures on macroeconomics, MIT Press, Cambridge, Massachusetts and London, England.
- Cooley T.F., 1995 Frontiers of business cycle research, Princeton University Press.
- Huggett, M., 1996 Wealth distribution in life-cycle economics, Journal of Monetary Economics 38, 469-494.
- Huggett, M, 1996 Wealth distribution in life-cycle economics

ECO-676:POPULATION ECONOMICS

History of Population Growth Population/labor as a factor of production: Population theories; Components of population changes: Sources of demographic data; National Population survey. Economic and Social Determinants of population trends and their consequences; Population policies and their impacts; Population programs in Pakistan and their impacts; Regional / provincial distribution of population in Pakistan; Impact of Population Growth on Economic Development.

Recommended Books

- Deaton, A., (1986). Demand Analysis, in Z. Griliches & M. Intrilligator, (eds.) *Handbook of Econometrics*, North Holland, Amsterdam.
- Blundell, R. and T. MaCurdy (1999), ALabor Supply: A Review of Alternative Approaches,@ in *Handbook of Labor Economics*, Vol. 3A, 1999, 1560-1695.
- Killingsworth, M. and J. Heckman, (1986), ALabor Supply of Women,@ in Ashenfelter and Layard (eds.) *Handbook of Labor Economics*, Vol. 1, 1986.
- Pencavel, J. (1986), ALabor Supply of Men: A Survey,@ in *Handbook of Labor Economics*, Vol. 1, 1986.
- Gronau, R., "Home ProductionCA Survey," in O. Ashenfelter and R. Layard, eds., *Handbook of Labor Economics*, Volume I, Amsterdam: North-Holland, 1986.

ECO-678 : OPERATIONS RESEARCH (OR)

- Topic 1. Introduction**
History, Meanings and introduction to Operations Research.
Art of modeling and phases of Operations Research.
Discussion on different types of Operations Research models.
- Topic 2. Linear Programming**
Meanings and objectives of Linear Programming Models. Formulation of Linear Programming model/problem. Solutions of linear programming problems:
(a) Graphical approach
(b) Algebraic solution (Simplex method, M-technique and two-phase method).(c)Degeneracy, Alternative optima, unbounded solutions and Non-existing solutions.
- Topic 3: Duality and Sensitivity Analysis**
Definition of the dual problem. Primal Dual relationship
Economic interpretation of duality. Sensitivity Analysis.
- Topic 4: Transportation Model**
Definition and application of the transportation model.
Solution of the transportation problem. The Assignment model, solution and application of assignment model. The transshipment model.
- Topic 5. Project Scheduling By Pert-CPM**
Meanings and purposes of Project Scheduling.
Arrow diagram representation, determination of critical path and floats
Construction of time chart and resource leveling. Probability and cost considerations in project scheduling. Project control.
- Topic 6. Inventory Models**
Meaning and objectives of Inventory model. Formulation of generalized inventory model. Types of inventory model:
(a) Deterministic Models:

Single-item static model, single-item model with price breaks, multiple-items static model with storage Limitations, Single-item N-period dynamic model and N-period production scheduling model.

(b) Probabilistic Models:

A continuous review model, single period models and multi period model.

Topic 7. Dynamic Programming

Elements of the Dynamic model.

Examples of dynamic programming models and computations.

Books Recommended:

1. Bunday, Brian D., "Basic Linear Programming," 1st edition, 1984, Edward Arnold.
2. Gillet, Billy. E, "Introduction to Operations Research, " 1st edition, 2001, McGraw hill
3. Hamdy Taha. A., "Operations Research An Introduction," 7th edition, 2002, Prentice Hall.
4. Hillier and Lieberman., "Introduction to Operations Research," 7th edition, 2002, McGrawhill.
5. Wagner, Harvey.M., " Principles of Operations Research," 2nd edition, 2001, Prentice Hall.

Reference Books:

6. DIMINTRICS BERSIMAS & JOHN N TSITSIKLIS, " Introduction to Linear Optimization" 2nd edition, 1997, Athena Scientific.
7. Fryer M.J "Introduction to Linear Programming and Matrix Game Theory". 1st edition 1978, Edward Arnold.
8. Gass M.J, "Linear Programming Methods and Application, " 1st edition, 1975, McGraw hill.
9. PAUL-A-JENSEN & JONATHAN F.BRAD, "Operations Research Models and Method, " 1st edition, 2002, Wiley.
10. WAYNELWINSTON, "Operations Research Application & Algorithm, " 3rd edition 1994, Duxbury Press.