

**CURRICULUM
OF
ECONOMICS
BS (4-YEAR)**

2008



**HIGHER EDUCATION COMMISSION
ISLAMABAD**

CURRICULUM DIVISION, HEC

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PREFACE

Curriculum development is a highly organized and systematic process and involves a number of procedures. Many of these procedures include incorporating the results from international research studies and reforms made in other countries. These studies and reforms are then related to the particular subject and the position in Pakistan so that the proposed curriculum may have its roots in the socio-economics setup in which it is to be introduced. Hence, unlike a machine, it is not possible to accept any curriculum in its entirety. It has to be studied thoroughly and all aspects are to be critically examined before any component is recommended for adoption.

In exercise of the powers conferred by sub-section (1) of section 3 of the Federal Supervision of Curricula Textbooks and Maintenance of Standards of Education Act 1976, the Federal Government vide notification No. D773/76-JEA (cur.), dated December 4th 1976, appointed the University Grants Commission as the competent authority to look after the curriculum revision work beyond class XII at the bachelor level and onwards to all degrees, certificates and diplomas awarded by degree colleges, universities and other institutions of higher education.

In pursuance of the above decisions and directives, the Higher Education Commission (HEC) is continually performing curriculum revision in collaboration with universities. According to the decision of the special meeting of Vice-Chancellor's Committee, the curriculum of a subject must be reviewed after every 3 years.

A committee of experts comprising of conveners from the National Curriculum Revision of HEC in Basic, Applied Social Sciences and Engineering disciplines met in April 2007 and developed a unified template to standardize degree programs in the country to bring the national curriculum at par with international standards, and to fulfill the needs of the local industries. It also aimed to give a basic, broad based knowledge to the students to ensure the quality of education. The new BS degree shall be of 4 years duration, and will require the completion of 130-136 credit hours. For those social sciences and basic sciences degrees, 63.50% of the curriculum will consist of discipline specific courses, and 36.50% will consist of compulsory courses and general courses offered through other departments.

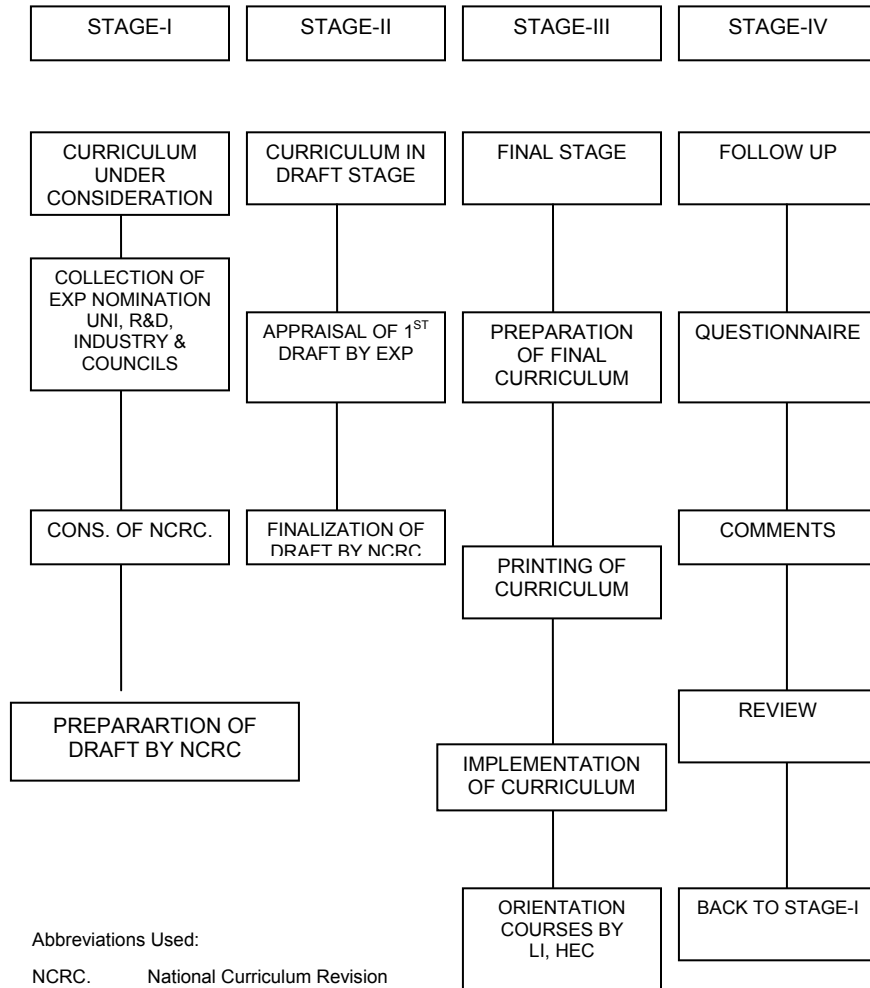
For the purpose of curriculum revision various committees are constituted at the national level, comprising of senior teachers nominated by universities, degree awarding institutions, R&D organizations and respective accreditation councils. The National Curriculum Revision

Committee for Economics in a meeting held on June 27-28, 2008 at the HEC Islamabad in continuation of its earlier meeting held on May 15-16, 2008 at HEC Islamabad revised the curriculum in light of the unified template. The final draft prepared by the National Curriculum Revision Special Committee, duly approved by the competent authority, is being circulated for implementation in the concerned institutions.

PROF. DR. RIAZ-UL-HAQ TARIQ
Member Academics

July 2008

CURRICULUM DEVELOPMENT



Abbreviations Used:

NCRC.	National Curriculum Revision Committee
VCC.	Vice-Chancellor's Committee
EXP.	Experts
COL.	Colleges
UNI.	Universities
PREP.	Preparation
REC.	Recommendations
LI	Learning Innovation
R&D	Research & Development Organization
HEC	Higher Education Commission

INTRODUCTION

The final NCRC meeting in Economics was held on June 27-28, 2008 at HEC, Islamabad which was follow up of the preliminary meeting held on May 15-16, 2008 at HEC Islamabad. The following attended the meetings:

- | | | |
|----|---|------------------|
| 1. | Prof. Dr. Toseef Azid,
Department of Economics,
Bahauddin Zakariya University, Multan | Convener |
| 2. | Prof. Dr. Zakir Hussain,
Chairman,
Department of Economics,
University of Sargodha, Sargodha, | Member
Member |
| 3. | Prof. Dr. Sofia Anwar,
Assistant Professor,
Department of Economics,
University of Sargodha, Sargodha | Member |
| 4. | Prof. Dr. Eatzaz Ahmad,
Department of Economics,
Quaid-i-Azam University, Islamabad. | Member |
| 5. | Dr. Pervez Zamurrad Janjua,
HEC, Foreign Faculty Expert,
IIIE, International Islamic University,
Islamabad | Member |
| 6. | Dr. Hafiz M. Yasin,
Chairman, School of Economics, IIIE
International Islamic University, Islamabad | Member |
| 7. | Dr. Rashid Naeem,
Chairman,
Department of Economics,
Allama Iqbal Open University, Islamabad | Member |
| 8. | Prof. Dr. Marhab Qasmi,
Department of Economics,
University of Sindh,
Jamshoro | Member |

- | | | |
|-----|---|----------------------|
| 9. | Dr. Syed Mohammad Arif,
Department of Economics,
University of Balochistan, Quetta | Member |
| 10. | Dr. Asad Zaman,
Professor, I.I.I.E.,
International Islamic University,
Islamabad | Member |
| 11. | Dr. Naeem-ur-Rehman Khattak,
Professor of Economics & Dean
Faculty of Social Sciences,
Department of Economics,
University of Peshawar, Peshawar. | Member |
| 12. | Dr. Asad Raza Abidi,
Department of Economics,
Shah Abdul Latif University , Khairpur | Member |
| 13. | Dr. Bashir Ahmad Khilji,
Associate Professor,
Department of Economics,
GC University, Faisalabad. | Member |
| 14. | Dr. Rana Ejaz Ali Khan,
Department of Economics,
The Islamia University of Bahawalpur,
Bahawalpur | Member/
Secretary |

The preliminary meeting started with the recitation from the Holy Quran by Mr. Shafiullah, Assistant Director, HEC. Prof. Dr. Riaz ul Haq Tariq, Member (Academics), welcomed the participants and asked them to adjust the existing curriculum of Economics in the light of the approved template/framework developed by HEC for 4-Year integrated BS program and suggest those books which are latest and readily available in the market. Then the members unanimously selected Prof. Dr. Toseef Azid, Department of Economics, Bahauddin Zakariya University, Multan as Convener and Dr. Rana Ejaz Ali Khan, Department of Economics, The Islamia University, Bahawalpur as Secretary of the meeting.

After two days long deliberation the members agreed on the following format and scheme of studies for BS 4-Year Economics.

FRAMEWORK FOR BS (4-YEAR) ECONOMICS

Compulsory Requirements (the student has no choice)		General Courses to be chosen from other departments		Discipline Specific Foundation Courses	
9 courses		7-8 courses		9-10 courses	
25 Credit hours		21-24 Cr. hours		30-33 Credit hours	
Subject	Cr. hr	Subject	Cr. hr	Subject	Cr. hr
English I	3	1. Sociology	3	1. Principal of Micro Econ.	3
English II	3	2. Education	3	2. Principal of Macro Econ.	3
English III	3	3. Psychology	3	3. Intermediate Micro Eco.	3
English iv/ Univ. optional *	3	4. World History	3	4. Intermediate Macro Economics	3
Pakistan studies	2	5. Geography	3	5. Statistics I	3
Islamic Studies / Ethics	2	6. Philosophy	3	6. Statistics II	3
Mathematics I	3	7. General Science	3	7. Deve. Economics	3
Mathematics II / Univ. optional **	3	8. Law	3	8. Research Methodology	3
Introduction to Computer	3	(List of Addit. General subjects is given)		9. Agriculture Economics	3
Courses: 9	25	Courses: 8	24	Courses: 9	27

Major courses including research project/internship		Elective Courses within the major	
11-13 courses		4 courses	
36-42 Credit hours		12 Credit Hours	
Subject	Cr. hr	Subject	Cr. hr
1. Micro Economics	3	1. Elective-I	3
2. Macro Economics	3	2. Elective-II	3
3. Econometrics I	3	3. Elective-III	3
4. Econometrics II	3	4. Elective-IV	3
5. International Trade Theory	3	5. Elective-V	3
6. Public Finance	3	6. Elective-VI	3
7. Mathematical Economics I	3	(List of Elective/Optional subject is given)	
8. Mathematical Economics II	3		
9. History of Economic Thoughts	3		
10. Islamic Economics	3		
11. Applied Economics	3		
12. Research Paper	3		
Courses: 12	36	Courses: 6	18

* University has the option to recommend any other course in lieu of English IV

** University may recommend any other course in lieu of Mathematics II

**SCHEME OF STUDIES FOR BS (4YEAR)
ECONOMICS**

Semester/Year	Name of Subject	Credits
First		
ECON 101	English I	3
ECON 102	Principal of Micro Economics	3
ECON 103	Islamic Studies	2
ECON 104	Mathematics I	3
ECON 105	Computer Application	3
ECON 106	Optional (Non-Economic)	3
		17
Second		
ECON 107	English II	3
ECON 108	Pakistan Studies	2
ECON 109	Principal of Macro Economics	3
ECON 110	Mathematics II	3
ECON 111	Optional (Non-Economics)	3
ECON 112	Optional (Non-Economics)	3
		17
Third		
ECON 201	English III	3
ECON 202	Intermediate Micro Economics	3
ECON 203	Development Economics	3
ECON 204	Statistics I	3
ECON 205	Optional (Non-Economics)	3
ECON 206	Optional (Non-Economics)	3
		18
Fourth		
ECON 207	English III	3
ECON 208	Intermediate macro economics	3
ECON 209	Statistics II	3
ECON 210	Agriculture Economics	3
ECON 211	Optional (Non-Economics)	3
ECON 212	Optional (Non-Economics)	3
		18
Fifth		
ECON301	Micro Economics	3

ECON302	Econometrics I	3
ECON303	Mathematical Economics I	3
ECON304	Optional (Economics)	3
ECON305	Optional (Non-Economics)	3
ECON306	Optional (Economics)	3
		18
Sixth		
ECO307	Macro Economics	3
ECON308	Econometrics II	3
ECON309	Mathematical Economics II	3
ECON310	Optional (Economics)	3
ECON311	Optional (Economics)	3
		15
Seventh		
ECON401	International Trade Theory	3
ECON402	Research Methodology	3
ECON 403	Public Finance	3
ECON404	History of Economics Thoughts	3
ECON405	Optional (Economics)	3
		15
Eight		
ECON 406	Applied Economics	3
ECON407	Islamic Economics	3
ECON408	Research Paper	3
ECON 409	Optional (Economics)	3
		12

Total Credit Hours = 130

In the final meeting the members furnish details of courses i.e. course outlines, contents, objectives and list of books for each course, assigned to them in the preliminary meeting.

List of Additional General Courses:

1. Mass Communication
2. International Relation
3. Principal of Accounting
4. Political Science
5. Spanish
6. Language

7. Russian
8. Arabic
9. German

List of Elective Courses (Optional):

001. General Equilibrium and Welfare Economics
002. Human Resource Development
003. Labor Economics
004. Population Economics
005. Comparative Economic System
006. Project Appraisal and Investment Analysis
007. Major Issues in Pakistan Economy
008. Environmental Economics
009. Operation Research
010. Dynamic Macro Economics
011. Monetary Economics
012. Monetary Policy
013. Fiscal Policy
014. Rural Development
015. International Trade Policy
016. International Finance
017. Development Policy
018. Institutional Economics
019. Financial Institution and Market
020. Game Theory
021. Managerial Economics
022. Political Economy
023. Industrial Economics
024. Transport Economics
025. Health Economics
026. Resource Economics
027. Experimental Economics
028. Urban Economics
029. Regional Economics
030. Topics in Marketing
031. Poverty Alleviation

MISSION STATEMENT

The main purpose is to achieve the highest possible standards of education, teaching and research in economics. More specific goals are:

1. *Encourage intellectual development and scholarship in economics.*
2. *Impart sound theoretical and applied knowledge of Economics.*
3. *Develop awareness in students to prepare themselves for national and international challenges.*
4. *Develop an ability in students to become effective independent researchers and learners.*
5. *Develop curriculum as per market needs and demand of institutions and society; considering the changing global and national requirements.*
6. *Prepare students to enhance knowledge and welfare of the society.*

Details of Courses

ECON 102 Principles of Micro Economics

3 Cr. Hrs.

Pre-requisite

F.A., F.Sc. or equivalent

Objectives

The course is designed for the beginners with either no formal background or very little acquaintance with economics. The objective is to give the students with a clear understanding of the basic concepts, tools of analysis and terminologies used in microeconomics. Emphasis will be on the use of graphs, diagrams and numerical tables/schedules for exposition. The teacher is expected to draw examples from the surrounding world to clarify the concepts.

Course Contents

Introduction

An overview of the social system, Economy as integral part of the social system, Economic agents and economic problem, Economics as a science of choices between competing wants and limited resources, Classification of economics, Importance and scope of micro-economics, Basic concepts: Commodities, Income and Resources, Production and Consumption, Exchange and Distribution.

The Price Mechanism

The concept of a market economy, Laws of demand and supply, schedules & graphs of demand and supply, Market equilibrium and determination of price, Movement along and shifting of demand and

supply curves, Concept of elasticity of demand and supply, Importance of elasticity.

Consumer's Behaviour

Consumers/ households as economic agents, Problem of the consumers, The utility theory, Laws of diminishing marginal utility and equi-marginal utilities, Budget constraint and consumer's equilibrium, Individual demand and market demand, Introduction to demand elasticity.

Firms and Industries

Business enterprises, Forms of business organization: Proprietorship, Partnership, Joint stock companies, Multi-national corporations, Classification of the firms, Production and supply of commodities (goods and services), Objectives of the firm: The profit motive, Output maximization and cost minimization, Industrial structure & market supply.

Production and Cost Functions

Production function, Primary inputs: factors of production, Secondary/intermediate inputs: Raw material and energy, The laws of returns, Revenues of the firm: total, average and marginal revenues, Cost function: Total, average and marginal costs, Short-run and Long-run costs, Equilibrium of the firm.

Market Structure

Classification of markets according to nature of commodity, extent, time and degree of competition, Perfect competition among buyers and sellers, Imperfect competition: Monopoly and Monoposony, Monopolistic competition, Price determination, The need for market regulation and role of the government, Public goods and their provision beyond the market.

Recommended Book

- Mankiw, G. - Principles of Economics - 2nd Edition (2001), South-West Publishers.
- Samuelson and Nordrons - Economics –18th Edition (2004)- McGraw Hill.
- McConnel and Bruce - Principles of Economics -17th Edition (2006)- McGraw Hill.
- Lipsey and Goerant-Principles of Economics-10th Edition (2003)- Oxford University Press

ECON 109 Principles of Macro Economics**3 Cr. Hrs.****Pre-requisite**

F.A., F.Sc. or equivalent

Objectives

The course is designed for the beginners with no formal background or little acquaintance with economics. The objective is to give the students with a clear understanding of the basic concepts, tools of analysis and terminologies used in macroeconomics. Emphasis will be on the use of graphs, diagrams and numerical tables/schedules for exposition. The teacher is expected to draw examples from the surrounding world to clarify the concepts.

Course Contents**Introduction**

The economy in aggregate, Complexities of the world of business, Scope of macroeconomics, Brief account of the development of macroeconomics after the World War-II, Concept of business cycles: Boom and Depression, Concepts of Inflation and Unemployment, Macroeconomic variables and their mutual relationship, Macro-models as abstraction from the real economy.

National Income

Definition and concept of national income, Measures of national income: Gross Domestic Product (GDP) and Gross National Product (GNP), GDP at factor cost and at market prices, Computation of national income: Product, Income and Expenditure approaches, Circular flow of income, Nominal versus Real income, Per capita income and the standard of living.

Components of Aggregate Demand

The Concept of Open and closed economy models, Concept of aggregate markets: Product, Money, Labor and Capital markets, Components of aggregate demand: Consumption, Investment and Government spending, Income and expenditure identities.

Money and Banking

Money: definition, forms and functions, Central Bank and its functions with reference to the State Bank of Pakistan, Commercial banking, The Quantity Theory of money, Inflation: measurement and impacts, causes of inflation and remedies, Monetary policy: brief introduction.

Public Finance and Taxation

Sources of public revenue, Various forms of taxes: Direct and Indirect, Income and Commodity taxes, Sales, Excise, Customs, Non-tax revenues, Major heads of public expenditure, Revenue and Capital account, Concept of budget deficits and sources of filling the gaps, Deficit financing, Fiscal policy: meaning and objectives.

International Trade

Global distribution of resources, Concept of imports and exports, Theory of absolute and comparative advantage, Currency exchange rates, Balance of Payments: causes of deficits in BOP of Pakistan and remedial measures, Custom Unions, The problem of external debt, Commercial Policy: objectives and scope.

Recommended Books

- Mankiw, G—Principles of Economics-2nd Edition (2001)- South-West Publishers.
- Samuelson and Nordrons - Economics –18th Edition (2004)- McGraw Hill. Inc.
- Parkin, Michael - Macroeconomics, 7th Edition (2004)- Prentice Hall.
- Miller, R.L.– Economics Today -14th Edition (2005) - Addison Wesley.

ECON 202 Intermediate Micro Economics

3 Cr. Hrs.

Pre-requisite

ECON 102 Principles of Micro Economics

Objectives

The objective of the course is to clarify and extend further the microeconomic concepts and to develop analytical skills and solving petty problems. In addition to diagrammatic approach, the students ought to get accustomed to simple mathematics and numerical tools. The teacher is expected to draw examples from surroundings for exposition.

The students may be given assignments to collect information from the markets and to analyze the data. They may have tours to the industrial units and to observe the process of production and problems in supply and demand.

Course Contents

Introduction

Scope of Microeconomics and areas of its concern, Economic agents and decision making, Brief account of the Theory of Value, The relationship between production and consumption, The role of markets and importance of price signals in efficient allocation of resources, Economic models as abstraction from the reality, Introduction to mathematical functions used in economics: Utility, Demand, Supply and Production functions etc.

Theory of Consumer Behaviour

Axioms of Rationality, The utility function and its arguments, Laws of diminishing marginal and equi-marginal utility, Indifference curves and their properties, Concepts of imperfect substitutes and complements, Marginal rate of (commodity) substitution (MRCS), Convexity of indifference curve and diminishing MRS, The budget constraint, Consumer's equilibrium and law of equi-marginal utility, Income & Substitution effects of a price change: diagrammatic representation, Normal, Inferior and Giffen goods, Gross substitutes and net substitutes, The indirect utility function, Non-homothetic Preferences, Introduction to the Revealed Preference Theory.

Demand & Elasticity

Derivation of demand functions using indifference curves, Ordinary and Compensated demand functions, Engel's law and classification of goods, Market demand as horizontal summation of individual demands, Elasticity of demand, Importance and types: Own-Price, Cross-Price and Income elasticity, Relationships among different demand elasticities.

Production Functions

Definition, classification and problems of firms, Production and value-added functions, Fixed and variable-coefficient functions, Some commonly used production functions: Cobb Douglas and CES etc., Average and marginal products of variable factors and their inter-relationship, Iso-quant maps, Marginal rate of (technical) substitution (MRTS), The cost line and equilibrium of the firm, Output maximization subject to given cost/budget, Demand for variable factors, Elasticity of substitution, Returns to scales and Economies of scales.

Cost of Production

Types of costs: Economic and Accounting costs, Opportunity costs, Fixed and Sunk costs, Total and variable costs, average and marginal costs, Short-run and Long-run cost functions, Decreasing, Constant and Increasing cost industries, Cost minimization subject to given/pre-

determined level of output, Input cost and demand for factors of production.

Behaviour of the Firm

Profit maximization (loss minimization) as the sole objective of all firms, Equilibrium of the firm when it faces the market, Total, Average and Marginal Revenues, Equality of marginal revenue and marginal costs, Economic profit and rent, Short-run and Long-run position of a price taking and price seeking firm, The controversy over the profit maximization hypothesis.

Market Structure and Price Determination

(i) The Perfectly Competitive Market

Assumptions of the model, Pure and Perfect Competition, Short-run and Long-run equilibrium of competitive firms, Supply functions in the short and long-run, Constant-cost and increasing-cost industries, Derivation of equilibrium Prices and Quantity using simple equations.

(ii) Monopoly and Monopsony

The market power of a firm, Sources of monopoly power: why do monopolies exist, Decreasing-cost industries and natural monopolies, Comparison between monopoly and monopsony, Short-run and Long-run Equilibrium of a firm with monopoly power, Price discrimination, Bi-lateral monopoly, Multi-plant monopoly, The social costs of monopolies, Public utilities and marginal cost pricing, Market regulation and anti-trust policies, Market equilibrium with monopoly power.

(iii) Monopolistic Competition and Oligopoly

Characteristics of monopolistic competition, Short-run and Long-run equilibrium, The basic theories of monopolistic competition, Comparison with pure competition & monopoly, The role of advertisement and media, Models of non-collusive Oligopoly: Cournot, Bertrand, Chamberlain, Sweezy etc. Price leadership and cartel formation.

Pricing of the Factors of Production

Derived Demand for Variable Inputs, The marginal productivity theory and its criticism, Modern theory of factor demand with emphasis on the labour and capital markets, The labour supply function, Wage determination and the role of government and labour unions, Input price

elasticity, Pricing of factors that are fixed in the short-run: Rents & Quasi-rents, Stock prices.

Recommended Books

- Pindyck and Rubinfeld with Mehta- Microeconomics- 6th Edition (2005)- Pearson Education, Singapore
- Walter Nicholson- Intermediate Microeconomics- 6th Edition (1994) or latest – The Dryden Press: Harcourt Brace College Publishers
- Koutsoyiannis, A.- Modern Microeconomics- 2nd edition (1979)- Macmillan.
- Varian Hall R.- Intermediate Microeconomics: Modern Approach- 6th edition (2002)- W. W. Norton Publishing Company, New York.
- Leftwich, Eckert – The Price System and Resource Allocation – 10th Edition (1988) or latest- The Dryden Press, New York.
- Dowling, Edward – Mathematics for Economists -(1980) - (Schaum's Outline Series) McGraw Hill Inc.

ECON 203 Development Economics

Cr. Hrs.

Course Contents

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 debate. 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, Complementarities, 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.

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.

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.

Economic Growth and Environment

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.

Recommended Books

- Balasubramanyam V. and Lall, S. (Latest eds.), Current Issues in Development Economics. McMillan , London.
- Chaudhary M. Aslam and Hamid, A., (1989). Human Resource Development and Management in Pakistan. Ferozsons, Lahore.
- Chaudhary M. Aslam and Eatzaz, A., (2004), Globalization: WTO, Trade and Economic Liberalization in Pakistan, Ferozsons, Lahore, Pakistan.
- Chenery H. B. and Srinivasen. Hand Book of Development Economics, vol. I & II, Amsterdam (1988, eds.). North Holland.
- Cypher J. M. and Dietz James L., (2004), The Process of Economic Development, Routledge. Tayl or Francis Group, London/New York.
- Ghatak Subarta, (2003), Introduction to Development Economics, Routledge, Taylor and Francis Group, London/New York.
- Herrick B. and Kindleberger C., (latest eds.). Economic Development. McMillan, New York.
- Hirshman A. O., (1960). Strategy of Economic Development, Yale University, Press.
- Jones H. G., An Introduction to Modern Theories of Economic Growth, (Latest Edition), McGraw Hills.
- Mahboob-ul-Haq Center for Human Development (MHCHD). Human Development in South Asia, Annual Reports, Islamabad.
- ----- (1999), A Profile of Poverty In Pakistan, (In Collaboration with UNDP).
- Meier Gerald M., Leading Issues in Economic Development, (Latest Issue),Oxford University Press.

- Thirlwall, A.P., (2003), Growth and Development, With Special Reference to Developing Economies 7th edition, Palgrave Publisher.
- Todaro M. P., Economic Development in the third World. Latest Edition, Heinemann, London.
- UNDP, Human Development Reports , Annual Reports.
- Van Den Berg H., (2001), Economic Growth and Development,* McGraw Hills.
- William, Easterly, Growth without Development, A Case Study of Pakistan, World Bank.
- World Bank, World Development Reports, Annual reports, 1986, 1987, 1990, 1991, 1992, 1994, 1995, 1998/99, 2000/2001 and 2004.
- Yotopolous Pan A. and Nugent Jeffery B., Economics of Development, Empirical Investigation (Latest eds.). Harper and Row Publishers, London/New York.

ECON 208 Intermediate Macro Economics

3Cr. Hrs.

Pre-requisite

ECON 102 Principles of Micro Economics

Objectives

The objective of the course is to clarify and extend further the concepts of macroeconomics so as they develop the capacity to understand the issues and problems of the economy in a global scenario. In particular, they have to capture the nature and scope of various public policies. In addition to diagrammatic approach, the students are confronted to simple mathematical and numerical analysis. The teacher is expected to draw examples from the surrounding world for exposition.

The students may be given assignments to collect information about various aspects of the economy. They have to read and understand the Economic Survey and Annual Reports of the State Bank of Pakistan. They may be asked to discuss the Federal and Provincial Budgets and to analyze the framework.

Course Contents

Introduction

The Keynesian revolution and growth of Macroeconomics, Actual vs. Potential Output, Analytical approach to macroeconomics, Oken's Law and unemployment, Price Indices and Inflation, The simple macroeconomic models, Lead and Lagged variables, Exogenous and

Endogenous variables and their functional relationships, Introduction to the Classical and Keynesian Schools of Thought.

Measurement of National Income

The circular flow of National Income, GDP and GNP, Measurement of GNP: Expenditure (demand), Product (supply) and Income (factor rewards) approach, Value added at factor cost and market prices, Personal and disposable income, Per capita income, GNP as measure of welfare, Injections into and Leakages from the economy: Saving and Investment, Exports and Imports, Domestic Absorption, Nominal and Real income, The GDP deflator, Problems in computation of national income, The underground economy, Components of Aggregate Demand: The closed and open economy models.

Theories of Consumption

Consumption as a function of income, Theories of Consumption: The Absolute income, Relative income, Permanent income and Life-cycle income hypotheses, Kuznet's findings and Reconciliation of Marginal and Average Propensity to Consume,

Saving and Investment

Definition of Investment, Real and Financial investment, Autonomous and Induced investment, Determinants of investment: The Present Value, IRR and benefit-cost ratio Criteria, Investment Demand and capital formation, Tobin's Q-Theory, Lags in Investment Demand, Volatility of Investment, Investment by the Public sector, Equilibrium in the goods market, Derivation of IS curve (graphic), Factors affecting the position and slope of the IS curve, The Saving-Investment gap in developing countries.

The Demand for and Supply of Money

The demand for money, The Quantity Theory of money, The Liquidity Preference/ Portfolio Balance Approach, The supply of money: M1, M2, M3 concepts, The money supply multiplier and the role of banking system, Instruments of credit control and the role of central bank, Equilibrium of the money market, Derivation of LM Curve (graphic), Factors affecting the position and slope of the LM curve.

Determination of National Income

The Keynesian model for a simple two-sector economy, inflationary and deflationary gaps, The concepts of multiplier, Interaction of the IS and LM functions and derivation of the aggregate demand function, The impact of changes in public expenditure, taxation and money supply on aggregate demand and the rate of interest.

Aggregate Supply and the Labour Market

The aggregate production function, Demand for Labor in the short run, Labor market and its Equilibrium: The flexible and sticky wage models, The imperfect information model, The short-run aggregate supply function, The concepts of full-employment and underemployment, Supply shocks and stabilization, Interaction of aggregate demand and supply and price determination.

Inflation and Unemployment

Types, causes and measurement of inflation, The structural and monetary approaches to inflation, Global inflation and its impacts on developing economies, Transitory and structural unemployment, The problem of unemployment with special reference to Pakistan, The relationship between inflation and unemployment, Phillips curve in the short-run and long-run, Remedial measures to combat inflation and unemployment.

Recommended Books

- Shapiro, Edward – Macroeconomic Analysis- 7th Edition (2000) – Harcourt Brace Inc.
- Froyen, Richard–Macroeconomics: Theories and Policies–7th Edition (2002) – Macmillan
- Mankiw, Gregory N.- Macroeconomics -6th Edition (2007), Worth Publishers, NY.
- Blanchard, Oliver – Macroeconomics -2nd Edition (2000)- Prentice Hall International.
- Dornbusch & Fisher – Macroeconomics- 9th Edition (2004) - McGraw Hill Inc.
- Pakistan Economic Survey (latest), Annual reports of the State Bank of Pakistan, Federal and Provincial Budgets (latest).

ECON 210 Agriculture Economics

3 Cr. Hrs.

Course Contents

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's 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.

Tenant's 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, Cheetham Model.

Criticism : Dual Economy 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.

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 Manners.

Choice of Planning Strategy for Agriculture Development, Agricultural Project Planning.

Recommended Books

- Brown, Lester, The Social Impact of Green Revolution, New York, The Greogic Endowment for International Peace, 1971.
- Capstick Margret. The Economics of Agriculture, London George Allen Unwin Ltd., latest edition.
- Chaudhary M. Aslam, (1989), Agricultural Development and Public Policies, Izhar Sons, Lahore.
- Ghatak S., and Ingersent K., Agriculture and Economic Development, (Latest Edition), Harvester Press.
- Johnston, Bruce, F & Fellir Kily. Agricultural and Structural Transformation, Economic Strategies in late Developing Countries.
- Khan Mahmood-ul-Hassan. The Economics of Green Revolution in Pakistan, New York, Published 1975.
- Karamat, A., Political Economy of Rural Development in Pakistan, Lahore Vanguard Book House, 1981.
- Shafi M., (1995), Pricing of Farm Produce in Pakistan, Objectives, Practices, and Experiences. Print Associates International, Islamabad.
- Thorbake Erike. The Role of Agriculture in Economic Development, New York, Columbia University Press (1971).
- Upton Marlin, Agricultural Production and Resource Use.
- Colman D. and Young T., Principals of Agricultural Economics, Markets and Prices in Less Developed Countries, (1989), Cambridge University Press.
- Yujiro Hayami and Vernon W. Ruttan, Agricultural Development, John Hopkin University Press, London. (Latest edition).

ECON 301 Micro Economics

3 Cr. Hrs.

Pre-requisite

ECON 202 Intermediate Micro Economics

Objectives

The course is designed for senior undergraduates. The objective is to confront them to advanced theoretical concepts and rigorous analysis with mathematical tools at hand. They have to develop the analytical skills and to enhance the capabilities to solve somewhat complicated problems. As usual, the teacher is expected to draw examples from the surrounding world for exposition.

The students may be given frequent assignments and exercises from the texts, which may be discussed by the teacher in the class after submission. The students should be motivated to use computer for solving the assignments.

Course Contents

The Theory of Consumption and Demand

Axioms of Rational Behaviour, The utility function and budget line, Constrained optimization and the Lagrange function, Utility maximization and ordinary (Marshallian) demand functions, Cost minimization and compensated (Hicksian) demand functions, The inter-relationship between ordinary and compensated demands, The indirect utility function and expenditure function, Homogeneity of demand functions, Elasticity of Demand, Euler's relation and demand elasticities, Engel's Law and income elasticity, Impact of a price change on demand, Bifurcation of the price effect into income and substitution effects, The Slutsky Equation: derivation and interpretation, Gross and net substitutes, Classification of goods: Normal, Inferior and Giffen goods, Clarification of the concepts by using Cobb-Douglas and CES utility functions.

The Theory of Production and Supply

The Production function: components, different forms, Properties of Cobb-Douglas and CES production functions, The iso-quant and its slope, The marginal rate of technical substitution, Diminishing MRTS and convexity of iso-quant, The cost function in relation to production function, Relationship between Average and Marginal cost functions, The short-run marginal cost and supply function, Relationship between the short-run and long-run average cost functions, Relationship between marginal revenue and marginal cost functions, Equilibrium of the firm in the short and long run, Demand for variable factors, Expansion path and returns to scales, Elasticity of substitution, The role of technical progress and shifting of production function overtime.

Market Structures and Price Determination

Critical appraisal of the competitive market assumptions, Efficiency of competitive market, Factors responsible for shifting of demand and supply functions overtime and impact on price, Govt. intervention in the market: price and quantity restriction and impact of taxation on price and consumer's surplus, The imperfect competition: Monopoly and Monopsony, Duopololy and Oligopoly, Monopolistic competition, The economic cost of imperfect competition, Elasticity of demand and Lerner index of market power, The case of public utilities and marginal cost pricing, Natural monopolies and the global markets, The multinational corporations, Introduction to: Game theory and strategic behaviour, Market with uncertainty and imperfect information.

General Equilibrium and Welfare Economics

The concept of efficiency and welfare, Conditions of allocative efficiency: consumption, production and product mix, Theorems of optimality/welfare, The efficiency of competitive market system, Equity and efficiency trade off, Partial versus general equilibrium, The pure exchange economy, Two sector economy (consumption and production), Diagrammatic approach: The Edgworth Box, Production possibility frontier and Social indifference curve, Introduction to computation of general equilibrium in a 2x2x2 (two consumers, two sectors/commodities, two factors) economy.

Recommended Books

- Nicholson, Walter - Microeconomic Theory: Basic Principles and Extensions- 8th Edition (2002) or latest -Thomson & Learning Inc.
- Henderson & Quandt - Microeconomic Theory: A Mathematical Approach- 3rd Edition (1980)– McGraw Hill International
- Silberberg, E. & Suen, W.- The Structure of Economics: A Mathematical Analysis- 3rd Edition (2001) – McGraw Hill International
- Layard & Walters – Microeconomic Theory- (1978) – McGraw Hill Book Company.
- Perloff, Jeffrey – Microeconomics – (1999) - Addison Wesley Longman, Inc.
- Pindyck & Rubinfeld – Microeconomics- 6th Edition (2004) – Pearson Education Asia.

Objectives

The course is designed to enable the students derive relationship between economic variables from the available data. The students should be in a position to apply statistical methods to data via simple mathematical models and to interpret the results by using economic theory. The students are encouraged to learn the use of simple computer programs and econometric packages in handling data and to understand the print outs.

The teacher should expose the students to the use of computer in solving simple econometric problems and assignments.

Course Contents

Introduction

Definition and scope of Econometrics, Economic theory as the basis for empirical analysis, Mathematical and Econometric models, Application of Statistical techniques to Economic data, Ingredients of Econometric modeling: Specification, Estimation, Evaluation and Forecasting.

The Classical Linear Regression Model (CLRM)

(a) The Simple Two-Variables Model

Variables and parameters, Meaning of the explained and explanatory variables, Estimators and estimates, Correlation and Regression theory, Mathematical versus econometric model, Structure of the linear econometric model with two explanatory variables, Rationale for inclusion of the disturbance term, Assumptions of the model with special reference to the disturbance term, The least squares principle, BLUE properties of the OLS estimators, The estimation procedure, The economic interpretation of the estimated coefficients, Hypothesis testing and the use of Z, t, F, test statistics, The confidence interval and tests of significance approaches, The ANOVA technique, The explanatory power of the model, Coefficient of determination vs. correlation coefficient: comparing regression and correlation theory, Econometric forecasting and confidence interval for the dependent variable against future value of the independent variable, Important features of a good forecast, Extensions of the model: Time as explanatory variable, Dummy variables, Estimation through the origin.

(b) The Multiple Linear Regression Model (MLRM)

The general format of MLR model, Assumptions of model with special reference to independence of the explanatory variable, Estimation of model with 3-4 explanatory variables using the OLS procedure, Interpretation of the estimated coefficients, Computation of elasticities, The degree of freedom and adjusted R^2 , The explanatory power of the model and 'Goodness of Fit', Hypothesis testing in MLR, Overall significance of the regression and the use of F-statistics, Economic theory and econometric modeling.

Deviation from the Classical Assumptions

Assumptions of the classical model and economic reality, Relaxation of the assumptions and estimation issues, Brief introduction to the nature of problems and alternatives.

(i) Multicollinearity

Linear relationship between any two explanatory variables, Nature and severity of the problem, Distinction between perfect and partial Multicollinearity, Properties of OLS estimators in the presence of collinearity, Detection of the problem and remedial measures.

(ii) Heteroskedasticity

Meaning of Heteroskedasticity, The nature of the problem with reference to economic theory, Cross-section data and the problem of non-constant variances, Consequences for OLS estimators, Detection of the problem and remedial measures in brief, Introduction to the Generalized Least-Squares model (GLS).

(iii) Autocorrelation

Autocorrelation and its causes, Time-series data and emergence of the problem with reference to economic theory, The AR(1) process, Consequences of Autocorrelation for OLS estimators, Detection of the problem and remedial measures in brief.

The Simultaneous Equations Models

Why Simultaneous Equations Models: Deviation from the classical assumptions, The simultaneous equations bias, Various types and general format of simultaneous equations models, Exogenous Endogenous variables, The structural and reduced-form models, The identification problem, Formal rules for identification: The Order and Rank conditions, The Indirect Least Squares (ILS), The Instrumental Variables and Two-Stage Least Square(2-SLS).

Recommended Books

- Gujrati, D.J. - Basic Econometrics – 4th Edition (2003)- McGraw Hill Company.
- Dougherty, Christopher – Introduction to Econometrics – 2nd edition (2002)
Oxford University Press.
- Koutsoyiannis, A.- Theory of Econometrics - 2nd Edition (1977) - McMillan.
- Wonnacot & Wonnacot –Econometrics – 2nd Edition (1970)-John Wiley, New York.
- Pindyck & Rubinfeld- Econometric Models & Economic Forecasts- 3rd Edition (1992)- McGraw Hill Inc.
- Maddala, G.S. – Econometrics - (1988) - McGraw Hill Company.

ECON 303 Mathematical Economics I

3 Cr. Hrs.

Objectives

The course is designed to enable the students use mathematical tools in clarifying their economic concepts and solving problems. This is because economic analysis requires extensive use of mathematics in the present day world of complexity. Mere logical reasoning and diagrammatic approach is perhaps not sufficient. This is true for positive economics in particular. As such, the students of economics have to learn and apply mathematics along side their theoretical underpinnings.

Homework: The students may be given assignments and exercises from the texts and weekly or fortnight class tests including MCQ's and confronted to extensive practice.

Course Contents

The Nature of Mathematical Economics

Pure and applied mathematics, The use of mathematical tools in social sciences, particularly in economics, Economic theory (logical argument) as description of some kind of relationship between variables, Mathematical Support: Expression of theory in functional form, Explaining properties of economic parameters like elasticity, propensity to consume etc., Verification of hypotheses and the use of mathematical models, Parameters and variables (dependent and independent), Linear and non-linear functions: quadratic, polynomial, circular, Types of functions: constant, rational, non-algebraic, logarithms & exponential, Rules of logarithms and exponents, Functions of more than two

independent variables, Graphs of various functions, The importance and limitations of mathematical models.

Equilibrium Analysis

Equation of a straight line: Intercept and Slope parameters and their economic interpretation, Partial and general equilibrium analysis, Single and Simultaneous equation models, Examples from market models: Demand and supply equations, Determination of price and quantity, Calculation of elasticities at equilibrium, The effect of an excise tax on market equilibrium, National Income determination: Closed economy with goods and money markets.

Linear Models and Matrix Algebra

Simultaneous equations models and the use of matrices, Types of matrices: Square, identity, null, idempotent, diagonal, transpose and their properties, Laws of matrix operations: addition/subtraction, scalar and vector multiplication, Conditions for non singularity of a matrix, Determinant & its properties, Minors and cofactors, Ad-joint and inverse of a matrix, Properties of inverse of a matrix, Solution of linear equations: the Gaussian method, the Cramer's rule and Inverse matrix method, Economic applications: Solution of market models, national income models, and the normal equations of the Least-Squares econometric model via matrix approach.

Differentiation

The concept of derivations, Functions of one variable and rules of differentiation: Sum-difference, product and quotient rules, chain rule, power function rule, inverse function rule, Implicit functions rule, Combinations of rules, differentiation of logarithmic & exponential functions, Higher order derivatives, Concept of maxima & minima, First and second derivative tests, point of inflection, Free and Constrained optimization, Partial differentiation & its rules, Hessian and Jacobian determinants, Higher order & cross partial derivatives (Young's theorem), Total differentials & total derivatives, Optimizing cubic functions.

Economic Applications of Differential Calculus

Analysis of Utility, Demand, Production, Cost and Supply functions, Lagrange function: Profit maximization and cost minimization under perfect competition and monopoly, Maximizing excise tax revenue in monopolistic competitive market, Comparative static analysis: Partial equilibrium market model, National Income model, Partial and Substitution elasticities, Optimization of unconstrained functions and their economic applications, Profit maximization by a multi-product and multi-plant firms, Price discrimination and monopoly, Optimization by using

Cobb- Douglas, CES and Translog functions with interpretation of the results.

Linear Programming

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

Recommended Books

- Chiang, A. C. - Fundamental Methods of Mathematical Economics – 3rd Edition (1984) - McGraw Hill Publishing Company.
- Frank, Budnick - Applied Mathematics for Business, Economics and Social Sciences- 4th Edition (1993) or latest – McGraw Hill Publishing Company.
- Dowling E. T.- Mathematics for Economists, Schaum's Outline Series- 3rd Edition
- (2001) – McGraw Hill Publishing Company.
- George, Alvery et al – Essentials of Mathematics with Business Applications-
- 5th Edition (1995) - McGraw Hill Publishing Company.
- Weber E. Jean - Mathematical Analysis: Business and Economic Applications- (Latest Edition) -Harper and Row Publishers, New York.
- Colin, Glass – An Introduction to Mathematical Methods in Economics- (Latest Edition) - McGraw Hill Publishing Company.

ECON 307 Macro Economics

3 Cr. Hrs.

Objectives

The course is designed for senior level undergraduate students. The objective is to enhance their analytical skills and to clarify further their macroeconomic concepts with quantitative tools at hand. They must have a strong theoretical foundation so as to understand the real problems of the economy with particular emphasis on inflation, unemployment, instability, deficit and debt etc. to which the developing countries are confronted at present.

Homework: The students may be given frequent assignments and exercises from the texts, Economic Survey, reports of the State Bank as well as from articles appearing in the press. The students should be motivated to use computer for solving the assignments.

Course Contents

Macroeconomics: The Classical Framework

Ingredients of the Classical model: The Says law of markets, The Quantity theory of money, The Marginal Productivity theory, Equilibrium in the goods and money markets, A critical appraisal of the Classical model, Dichotomy in the economy.

The Demand Management Economy

The Keynesian framework, Characteristics of a depression economy, Innovations due to Keynes: The consumption function, The liquidity preference function, Wage rigidity in the labour market, The ISLM model, Mathematical derivation of the IS and LM functions, The interaction of the goods and money markets in a closed economy, The role of public sector investment, The multiplier effects of fiscal and monetary actions, Derivation of the aggregate demand curve/function, Stabilization and the relative effectiveness of fiscal and monetary policies, The Neoclassical critique of the Keynesian model: the Keynes effect, the Pigou effect, the Real Balances effect, The Keynesian-Neoclassical Synthesis.

The Supply Side Economics

Demand for and Supply of Labour, The wage rate determination, Rigidity versus flexibility of nominal wage rate, The short-run Production function, Derivation of Aggregate Supply under the Classical and Keynesian assumptions, The notions of full-employment and under-employment, Scarcity of raw material and energy, The supply side disturbances leading to stagflation, The problems of developing countries: shortage of supply vs. deficiency of demand, The scope for structural changes (instead of fine tuning) in developing economies.

The Open Economy Macroeconomics

Balance of Payments: Current and Capital account, The IS-LM-FB model due to Mundell and Fleming, The case of a small open economy with special reference to developing economies, The relative effectiveness of Fiscal and Monetary policies under the Fixed and Floating exchange rate regimes, The Managed exchange rates system, Determinants of the Exchange Rates, Devaluation and its impacts for developing countries, Perfect and imperfect capital mobility, Problems of stabilization in a global framework..

Macroeconomic Policy Debate

Policy Actions: Active or Passive, Ignorance, Expectations and the Lucas Critique, Conduct of Policy: Formula/Rule vs. Discretion, Distrust of Policy makers and Political Process, Macroeconomics Policy: the Fiscal, Monetary and Commercial policies, Policy formulation and

implementation in a world of uncertainty, Seignorage and Inflation: Monetarists vs. Activists, the short-run and long-run analysis of the Phillips Curve, The expectation-augmented Phillips Curve, The Perfect Foresight and adjustment.

Growth and Business Cycles

The accumulation of capital, Acceleration principle and the concept of steady state growth path, The steady state conditions, The basic Neoclassical (Solow) growth model, Golden rule for consumption and investment (capital accumulation), The role of technical progress in growth, Introduction to the theory of Real Business Cycles: Interpretation, Labor market, Technology shocks, Household Behaviour, the persistence of output Fluctuations, Limitations of the Model.

Recommended Books

- Branson, William – Macroeconomics: Theory and Policy – 3rd Edition (1989) or latest Harper and Row, New York.
- Froyen, Richard–Macroeconomics: Theories and Policies – 7th Edition (2002)
Prentice Hall
- Gupta, G.S.- Macroeconomics: Theory and Applications- 2nd Edition (2004)
Tata McGraw Hill Publishing Company, New Delhi
- Scarth, William, M – Macroeconomics: An Introduction to Advanced methods-
2nd Edition (1996)- Dryden Press: Harcourt Brace & Company.
- Romer, David - Advanced Macroeconomics -(2001)- McGraw Hills, New York.
- Mankiw, Gregory- Macroeconomics- 5th Edition (2003)- Worth Publisher, New York.

ECON 308 Econometrics II

3 Cr.Hrs.

Objectives

The course is designed for senior undergraduates more inclined towards quantitative studies. The objective is to enable the students dive deep into complex problems of the real world economic life. They have to understand data problems, to have good grasp over advanced estimation techniques and to have the capability of inferring results accurately. The students have to learn certain computer packages like SPSS, E-views and Strata besides Excel.

Laboratory work: The students are required to devote at least one hour per week to computer laboratory. They have to develop the capacity to read and understand papers that appear in research journals.

Course Contents

Overview of the Classical Regression Model

The multiple regression (K-variable) model in matrix format, Assumptions of the model, The Least-Squares estimation procedure in matrix notation, Properties of the OLS estimators, Interpretation of the Beta coefficients ($\beta_1, \beta_2, \dots, \beta_k$), Hypothesis testing using matrix approach, Forecasting in OLS model, Time as an explanatory variable, Regression on Dummy variables, Dummy variable trap, Chow test, Specification bias and Errors in variables, Estimation with endogenous lagged variables, Restricted Least Squares,

The Generalized Least-Squares Model

Deviation from the assumptions of the classical regression model, The problem of heteroskedasticity, The GLS model in matrix format, Detection of the problem and consistent estimators, The problem of autocorrelation: Autoregressive and Moving Average processes, The Durbin-Watson statistics, Alternative estimation techniques.

The Maximum Likelihood Estimators

The likelihood function, Properties of ML estimators: consistency, Asymptotic normality, efficiency, Comparison with OLS estimators, Instrumental variable (IV) estimators

Time Series Analysis

Rationale for univariate analysis, ARMA and ARIMA Models, Comparison of forecast based on ARIMA and regression models, Stationarity, Unit roots, co-integration and error correction models, Introduction to Autoregressive Distributed Lag models, ARCH models

Recommended Books

- Johnston, J & John Dinardo- Econometric Methods – 4th Edition (1997) The McGraw Hill Companies, Inc, Singapore.
- Intrilligator, M - Econometric Models: Techniques and Applications- N. J. Prentice Hall, (Latest).
- Judge, George G. et al - The Theory and Practice of Econometrics- (1988)
- John Willey and Sons.
- Maddala, G.S. & Kim –Unit Roots, Co-integration and Structural Change -(1998)

- Cambridge University Press.
- Johnston, J.- Econometric Methods – 3rd Edition (1991)- McGraw Hill Company
- Kamenta, J. - Elements of Econometrics - 2nd Edition. (1971) – Macmillan

ECON 309 Mathematical Economics II

3Cr. Hrs.

Objectives

Objectives: The course is designed for senior undergraduates more interested in quantitative economics. The objective is to confront the students to advanced mathematical techniques so as to enable them handle economic models, interpret the results and solve complex problems.

The students may be given assignments and exercises from the texts and weekly or fortnight class tests and quizzes including MCQ's.

Course Contents

Complex Number and Circular Functions

Imaginary and Complex Numbers, Complex Roots, Circular Functions, Properties of Sine & Cosine functions, Euler and Maclaurin series, Alternative representation of Complex Numbers.

Integral Calculus

Comparative Dynamics and Integration, The Nature of Indefinite Integrals, Rules of Integrations and Operation: Substitution Rule, Integration by parts. Definite integrals and their properties, Definite Integrals and Area under a curve, Improper integrals, Economic Applications of Integrals: Finding total functions from marginal functions, Investment & capital formation, Present value of cash flow, P.V. of a Perpetual Flow, The Domar growth model.

Differential Equations

(i) First Order Linear Differential Equations

Meaning and Definition; Homogenous & non-Homogenous cases, Solution of first order linear differential equations: with constant coefficient & constant term, with variable coefficient and variable terms, Qualitative approach: Concept of phase diagrams, types of time paths and the dynamic stability of equilibrium, Exact differential equations: Solution and Verification, Non-linear differential equations of the first order and first degree, Bernoulli Equation,

Separable Variables, Economic Application: Dynamics of market models, Solow growth model.

(ii) Higher Order Differential Equations

Solution and Verification of second order linear differential equations with constant coefficients and constant terms, Real and imaginary roots, Distinct, repeated roots and complex roots, Dynamic stability of equilibrium, Economic applications: Market models with price expectations, The Interaction of inflation and unemployment in continuous time, Higher order differential equations, Convergence and the Routh theorem, Solution of simultaneous difference equations.

Difference Equations

(i) First Order Difference Equations

Meaning and definition, First order linear difference equations: Solution and verification of results, Conditions for dynamic stability of equilibrium, Types of time paths, Economic applications: The Cobweb model, Market model with inventory, Model with price ceiling, Nonlinear difference equations, The qualitative/graphic approach and phase diagrams.

(ii) Higher Order Difference Equations

Solution and verification of second-order linear difference equations with constant coefficients and constant terms, Real and imaginary roots, Distinct, repeated and complex roots, The convergence and divergence of the time paths. Economic applications: Models of business cycles, The Multiplier-Acceleration interaction model, inflation-unemployment model in discrete time, Higher order difference equations and their solutions, Convergence and the Schur's theorem, Solution of simultaneous difference equations.

Non-Linear Programming

The nature of non-linear programming, Non-linearities in Economics, Kuhn-Tucker conditions and their interpretation, The Kuhn-Tucker Sufficiency theorem: Concave programming, The Arrow-Enthoven Sufficiency theorem: Quasi-concave programming, Economic applications: Utility maximization, Least-cost combination,

Recommended Books

- Chiang A.C and Kevin Wainwright - Fundamental Methods of Mathematical Economics- 4th Edition (2005) McGraw Hill Publishing Company.

- Gandolfo, G – Economic Dynamics: Methods and Models – (1983 or Latest Edition)
- North Holland Publishing Company
- Dowling Edward T. -Mathematics for Economics: Schaum Series – (1981).
- Weber E. Jean, Mathematical Analysis, Business and Economic Application (latest edition), Harper and Row Publishers, Netherlands.
- Hoy M., Livermois J, Rees R, Stengos T. - Mathematic for Economics – (1996) - Addison & Wesley Publishers.
- Shone, R – Economic Dynamics: Phase Diagrams and their Economic Applications- (1997)- Cambridge University Press.

ECON 401 International Trade Theory

3 Cr. Hrs.

Objectives

To teach the theories of I Trade to interrelate other branches of economics

Course Contents

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. Disagreements on Free Trade: Overview of Emergency of International Trade Issues. The Elasticity of Exports Demand and Balance of Payment. Substitution and Income Effects, Impacts of Rise in Exports Demand.

Growth and Trade

International Trade and Shift in Production Function, Immerizing Growth, Output Growth and Terms of Trade (T.O.T) / Deterioration: Uniform Growth at given T.O.T. The Transfer Problem: Marshall Plan and Transfers, Transfer of Resources: Neutral Case.

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 Tradable, 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. Newly Industrializing Countries (NIC's) and Footloose Production Process. NIC's and H.O Theorem. The Product Cycle, Critical Analysis of Traditional Trade Theories. Rybescky Theorem and its critical review.

Markets, Cartels and International Trade

Monopoly and Import Competition, Export Opportunities. Product Differentiation and Monopolistic Competition. Dumping / Discrimination and WTO, Competitiveness and Market Share, Gains from Migration. WTO and Factor's Movements and the Commodity Movement. Multinationals Firms and Foreign Direct Investment, Transfer of Capital, Technology, Skill and other Gains, Transfer of Resources and Transfer Problem.

Tariff, Quota, Trade Policies and WTO

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.

Managed Trade, Quantitative Restrictions, Voluntary Export Restrictions and Their Impacts. Trade Diversion and Preferential Arrangements. WTO: Injury, Anti-dumping Duties, Tariff and B.O.P Support. Success and Failure of WTO Agenda. WTO Rules: Sanitary, Phytosanitary, Dumping, Anti-Dumping etc Rules and Emerging New Issues and Their Impacts.

Major Contemporary International Economic Issues:

WTO: GATT and Emergency of WTO. Why necessary to Join WTO? WTO: Major Trade Rules and Their Expected Impacts on Trade, B.O.P Deficit. WTO and Fair Trade / Free Trade. Free Trade will it be? Issue of "Are Free Trade Gains more than Restricted Trade"? Emerging Regional Trading, Blocks, Special Preference and their Impacts. Issues relating to the Contributions of International Financial Institutions and Their Evaluations. Is there need to Reform International Institutions? Monetary Integration and Their Impacts. Terms of Trade Issue.

Recommended Books

- Caves Richard, E., and Jones Ronald W., World Trade and Payments: An Introduction, Latest Editions. Little, Brown and Company, Boston, Toront. Latest edition..
- Chacholiades, Miltiades, International Trade Theory and Policy (Latest Edition). McGraw Hill Book Company, New York, London, Latest edition.
- Donomick Sal Vatore B., International Economics (Latest Edition), Prentice Hal, Latest edition.
- Grubel Herbert C., International Economics, (Latest Edition) Richard D. Irwin Inc., Honewood, Illinois.
- Peter Holinder & Thomas A., Pugel., International Economics. Latest edition.
- Sodersten B. and Geoffry Read., (1994). International Economics, MacMillan Press Ltd. Latest edition.
- The Global Competitiveness, Report 1999, World Economic Forum, Oxford University Press, Oxford, New York.
- World Bank. World Development Report, 1986. Oxford University Press.
- Baldwin Robert L. and Richardson David J., (1986). International Trade and Finance, Little Brown and Company, Boston, Toronto.
- Moran Theodore H., (1985). Multinational Corporations: The Political Economy of Foreign Direct Investment. Lexington Books. Toronto, Massachusetts.
- Krugman and Obstfeld, International Economics: Theory and Policy, Addison Willey (1998).

ECON 402 Research Methodology

3 Cr. Hrs.

Course Contents

Importance of Research Methodologies. Research techniques in social sciences and their limitations. Theory and basis of research. Empirical and theoretical research. Stages of research process. Identification of problem/issue, data, theory and estimation and related problems. Thinking, Field Research Designs; the process of field research, Exploratory Research, Casual Inference. Methods of communication in survey. Vision survey and communication techniques. Art of asking questions and getting quality information. Preparation of Research Proposal Questionnaire, Sample Design; the Nature of Sampling, Measurement and Scaling; Measurement, Measurement Scales, the Characteristics of Sound Measurement, the Development of Measurement Tools, Scaling, the Nature of Scaling, Response Methods, Scale Construction. Data Collection Methods, Survey Instruments and

Field Procedures; Survey Instrument Designs, the Survey Situations, the Instrument Development Process, Questionnaire Development, Field Procedures, Personal Interviewing, Telephone Interviewing, Interviewing by mail, observations. Data collection, Observation, Experimentation and Simulations; Experimentation and Simulation. Choice of Research Technique, Experimental Research Design, Simulation, Observation, Observation Designs. Use of Secondary Data; the Nature of Secondary Data Sources, the Use of Secondary Data, Types of Secondary Data Sources, Statistical Sources, Data Research Procedures, Evaluating Secondary Data. Vision Survey: Interpretation of Replies. Data Presentation and Analysis: Elements of Analysis, Data Preparation, Special Data Problem, Tabulation, Data Presentation, and Data Analysis. Report Writing; the Questions and analysis of Research Proposal. Organization of Research Paper. How to format and Write country Research Report. Executive summary and abstract of a report. Conclusion and its basis. Evaluation of Research Work. The Research Report, Research Report Format, Writing and editing of research Report.

Recommended Books

- Birchenhall C. and Grout P., (latest edition), Mathematics for Modern Economics, Herifaq Publishers, New Delhi.
- Holt, Rinehart and Winston, Holt-Sounders Japan Ltd. Tokyo (Latest edition).
- Johnson, Glenew Research Methodology for Economists: Philosophy and Practice, McMillan Publishing Co. (Latest edition).
- Kidder Louise H., Research Methods in Social Relations.
- Lambert, P., (1985) Advanced Mathematics for Economists. Static and Dynamic Optimization, Basil Black Well.
- Neuman W. Lawrence, (1997) Social Research Methods, Qualitative and Quantitative Approaches, Allyn and Bacon; Boston.
- Sckaran Business Research Methods
- Uma, Sekarn, (1992), Research Methods for Business. A Skill Building Approach, John Willey & Sons, Inc.
- Young Pauline V., (latest edition), Scientific Social Survey and Research, Prentice Hall Inc.
- Zikmund William, G., (1994), Business Research Methods, The drydem Press.

ECON 403 Public Finance

3 Cr. Hrs.

Course Contents

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), Cannons 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.

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.

Fiscal Relations

Fiscal and Economic Aspects of Federalism, Federal – Provincial Fiscal Co-ordination, Collection of Revenue and Provincial Share and its Distribution Criteria. Deficit Financing and its Impacts.

Recommended Books

- Bernard P. Herber, (1999), Modern Public Finance.
- Chellieah R.J. (Latest eds.), Fiscal Policy in Less Developed countries.
- David N. Hyman, (1996), Public Finance, A Contemporary Application of ---. Harcourt Brace College Publishers.
- Govt. of Pakistan, Economic Survey, Yearly Publication, Ministry of Finance, Economic Advisory Wing, Islamabad.
- Rosen and Harvey S., (1999), Public Finance, McGraw Hill.
- Musgrave R.A. and B.P., Musgrave (Latest Eds.), Public Finance in Theory and Practice, McGraw Hill.
- Stiglitz E., (2000), Economics of The Public Sector, W. W. Norton & Co.

ECON 404 History of Economic Thoughts

3 Cr. Hrs.

course Contents

Introduction

Introduction: Importance of Economic History: Approaches to Study the Subject. Overview of Ancient Greek, Roman and Medieval Economic Thought. Overview of Ancient and medieval thoughts, Quensey's influential ideas, Feudalism, Mercantilism, Nature's Circular Flow, Process of modern theories and thoughts. Overview of Islamic thoughts: Ibne-Khuldoon and thereafter. Overview of Silent Features of Muslim School of Thought

Mercantilists and the Physiocrats

The Contributions of Mercantilists and the Physiocrates. A doctrine of economic process, transition to liberalization: Wage theory to natural price, the task of government. Overtime, Changing Role of Government.

Classical School

The Contributions of Classical School, Adam Smith; Malthus and Ricardo etc., The Labor Theory of Value. Bullin Debate. Ricardo's Monetary Thought. Evolutionists, Ricardo and Reformers of 18th Century. The Theory of Rent. Profit Concepts of Colonization. Economic

Socialism

Socialism before Marx. English Socialists. Anarchism. Karl Marx's Contributions. The Class Struggle. Criticism on Marx. Challenges to Capitalism. German Historical School, Weber's contributions. The Marginalist School, Neo-Classical Economics. Jeons Inference. The concept of Welfare State. Chamberlin and Robinson. Australian School of thought. Veber and Galberith's Contribution.

Keynesian and Post Keynesian School

The Keynesian and Post Keynesian School, The Great Depression: Economic Policies and Capitalist Instability Between the World Wars. The 20th Century Paradigms. The Growth of International Economy. The Rise and fall of Post World War II. The American economic history and Lessons.

- i) The Emergence of Modern Economic Growth, Building Blocks, Industrial Revolution, Structuralist and Dependency School of thought; Sunkel, Amir Samer, Frank and others' contribution. Technological Change and Impacts.

The Crisis of the 1970's and International Responses. Failure of Trickle down effects. Rational Expectation Revolution. Basic Needs Approach and welfare. Emergence Famine and Poverty.

- ii) Modern Economic Thought. Comparison of Post Keynesian and Monetarist Thoughts. Supply side economics. Globalization, Liberalization and New Weave of Economic Growth and Welfare. New Growth Theory. Convergence and Divergence Debate. Future of Economics, Quality and International Trade and emergence of markets, New Regionalism, New directions of research. Environment and sustainable growth.

Recommended Books

- A History of Economic Ideas, (1959), Robert Lekachman, McGraw Hill Company.
- Economic Theory in Retrospect, Blaug, (1978), Cambridge University Press.
- Frank A. G., (1998), Global Economy in the Asian Age, Univ., of California Press.

- Henry John D., The Future of Economics, (1992), Black Wall Publishers.
- Marx k., and Engles F., The Communist Manifesto, Peoples Publishing House, Moscow, latest edition.
- Rima Ingrid, Development of Economic Analysis, Routledge Publishers (Latest ed.).
- Spechler, Martin C., (1990), Perspective in Economic Thought, McGraw Hills.
- The Main Current in Modern Economics (latest edition), The Free Press of Glancer.
- Theories of Value and Distribution (latest Edition), Dobb M., Cambridge Univ. Press, Latest edition.
- Twenty Contemporary Economist ed. (1981). Schach and Locksley, MacMillan Press.

ECON 406 Applied Economics

3 Cr. Hrs.

Course Contents

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 Econometric 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.

Econometric 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

- E-View Manual, (Learning help available with package (software)).
- Gimi, Carter and Annette, Marquis, with Karl Browning, Mastering Microsoft Office XP Premium, Selection B.P.B., Publishers, New Dehli, (2001).
- Robertson, D.F., Computer Applications and Programming, Har Brace Jovanovich Inc. USA (latest edition).
- SPSS-Manual

ECON 407 Islamic/Ethics Economics**3 Cr. Hrs.****Objectives**

The course is designed for senior students having gone through some basic courses in economic theory and development economics. The objective is to let them realize that Islam provides full guidance to its followers in all spheres of social life. The students have to understand the Islamic injunctions ordained for economic behaviour, both in the individual as well as collective capacity. They have to compare the prevailing system with that devised by Islam, to capture the socio-economic problems faced by the present day Muslim countries and to find ways and means to reconstruct the system in vogue according to Islamic guidelines so as to achieve greater stability, equity in distribution and reduction in poverty as the primary goals of all developing nations.

Course Contents

Introduction

Islamic Economics: Definition, Nature, and Importance, Islamic Economics Versus Secular Economics, The foundations of Islamic Economics, Brief Introduction of the Basic Values of Islam; Piety (Taqva), The lawful and unlawful (Halal and Haram), Trusteeship, Accountability, Justice, Benevolence, Equality, Brotherhood and Cooperation, Determinants of Economic Behaviour and Policies in Islam.

Islamic Economic Thought

Contribution of prominent scholars towards development of Islamic Economic Thought (Imam Abu Yousuf, Imam Abu Ubaid Al-Qasim, Ibn-e-Khuldoon, Imam Ibn-e-Taimiyah, Shah Walliullah Dehlawi, Maulana Maududi, Baqar-al-Sadar etc).

Microeconomics in Islamic Framework

a. Consumer's Behaviour

Objectives, Success in this world and the life Hereafter, Moderation in consumption, restricted set of preferences, altruism and charitable donations (Zakah and Sadaqat), Utility function, Consumer's equilibrium in an Islamic framework.

b. Behaviour of the Firm

Business Ethics in production and marketing, Permissible and prohibited activities, Hoarding and gains, Forms of business organization: Proprietorship, Partnership (Muzara'h, Mudharbah, Musharakah), Joint Stock Company (Sharikah), Modes of investment and financing.

c. Market structure

The concept of fair trade, Resource allocation under Islamic environment, Emphasis on competition, The case of monopolies and cartels in an Islamic system, Behaviour of the retailers, stock holders and whole-sellers, Types of transactions (Bai Fasid, Bai Salm, Bai Muajjal, Murabaha), Principles of financial contracts, Determination of price and the rate of Normal profit, Meeting of losses, Price mechanism and role of the State in market regulation.

Macroeconomics in Islamic Framework

a. Some Basic Macroeconomic Concepts

Consumption, saving and investment functions, Determinants of consumption and Investment functions in Islamic environment, Concept of helping others, The parameters of Public spending in

Islamic framework, International trade relations, Inflation and unemployment, Stabilization policies in Islamic framework.

b. Money and Banking

Commodity money, Paper money and Credit money, The concept of Riba (interest): its interpretation and implications, Justification of interest in the conventional theory, Rationale for prohibition of interest-based transactions and gambling, Models of interest-free Commercial Banking, Modes of financing investment: leasing (Ijarah), partnership in capital (Musharka), principal-agent Murabaha, Bai-Salam, Bai Muajjal etc., Central Banking and monetary policy in Islamic framework: Combating inflation, Design of capital markets and Insurance.

c. Public Finance and Fiscal Policy

Sources of revenue and heads of expenditure of an Islamic State, the scope for taxation, Objectives of fiscal policy: Social justice, Equity in distribution and elimination of poverty, Beneficiaries of Zakat, Exemption limits and rates of Zakah, Economic impacts of Zakah & Usher: the multiplier effect, Financing economic growth and development in Islamic perspective, The case of domestic and foreign borrowing,

Islamic Economic System

Salient features of an Islamic Economic System: Objectives, Economic Freedom, Equity and Efficiency, Social and distributive justice, The relative importance of Capital and Labour, Private ownership and property rights, Family system and the law of inheritance, The institution of Zakah and Bait-ul-Mal, Wider circulation of wealth, Fulfillment of basic needs, The institution of Interest and its inconsistency, Rationale for prohibition of interest, Role of the State in an Islamic system, Protection of faith and Islamic values, Economic and social welfare, Alleviation of poverty and reducing of inequalities, Comparison of Islamic economic system with Capitalism and Socialism.

Islamization Process in Pakistan

Islamization of the banking and financial system: Reports of the CII and implementation issues, The role of financial institutions in the private sector, Implementation of Zakah and Usher system: Prospects and Problems, A brief survey of changes that have taken place in economic and financial structure since 1980's, Islamic Banking practice and the role of the State Bank of Pakistan, The process of Islamization in other countries like Iran, Sudan, Malaysia.

Recommended Books

- Ahmed, Khurshid – Studies in Islamic Economics- (1980) King Abdul Aziz University Jeddah and The Islamic Foundation UK
- Ziauddin et al (Ed) – Money and Banking in Islam – (1983)- King Abdul Aziz University Jeddah and Institute of Policy Studies Islamabad.
- Ziauddin et al (Ed) – Fiscal Policy and Revenue Allocation in Islam – (1983) King Abdul Aziz University Jeddah and Institute of Policy Studies Islamabad.
- Siddiqui, M.N.- (1983)- Issues in Islamic Banking - Leicester, The Islamic Foundation, UK.
- Iqbal, Munawar (Ed) – Distributive Justice and Need Fulfillment in an Islamic Economy – (1986) – IIIE, International Islamic University Islamabad.
- Mannan, M.A.- Islamic Economics: Theory and Practice, A Comparative Study - (1986) - Cambridge, Hodder and Stoughton.
- Sayyid Tahir et al (Ed) – (1992) - Readings in Microeconomics: An Islamic Perspective – Longman Malaysia.
- Chapra, M. Umer – Just Monetary System – (1993) – IIIT New York and Islamic Research Institute, IIU Islamabad.
- Taqi Usmani, Justice M – (2000) - Introduction to Islamic Finance - Idarat-al- Ma'arif Karachi.
- Siddiqui, M.N. – (2001)- Economics: An Islamic Approach – Institute of Policy Studies Islamabad and The Islamic Foundation, UK.
- Yasin, Hafiz M. – Economic System of Islam – (1993) -Lecture Notes (mimeographed) – IIIE, International Islamic University Islamabad.
- Badawi, Muhammad A. Zaki- Zakat and Social Justice: English transliteration of the Book: Kitab ul Amwal by Imam Abu Abaid Al-Qasim - (1979) - The Islamic Council of Europe, London.
- Chapra M. Umer (1991)- The Economic System of Islam- University of Karachi.
- Khan, M. Fahim – (1983) - Macro Consumption Function in an Islamic Economic Framework - International Centre for Research In Islamic Economics, King Abdul Aziz University, KSA.
- Khan M. Fahim – (1995) - Human Resource Mobilization through the Profit-Loss Sharing – IRTI, Islamic Development Bank Jeddah.
- Khan, Tariqullah, (1996), Practice and Performance of Mudabah: A case study of Pakistan, IRTI, Islamic Development Bank, Jeddah.

- Mahdi, M. Ahmad, (1995), Islamic Banking Modes for House Building Finance - IRTI, Islamic Development Bank, Jeddah.
- Mannan M.A. - (1996) - Financing Development in Islam - IRTI, Islamic Development Bank, Jeddah.
- Naqvi, Syed Nawab Hyder- (1981)- Ethics and Economics - Leicester, The Islamic Foundation, UK.
- Ghazanfar S.M., (2003), Medieval Islamic Economic Thoughts- Routledge Publishers.
- Nomani, Farhad & Rehnuma., Ali- (1994) - Islamic Economic Systems – Zed Books Ltd., London.
- Nuti, D. Haris, (1995), The Economics of Participation, IRTI, Islamic Development Bank, Jeddah.
- Yusaf, Imam Abu, Kita bur Kharaj, Lahore, Islamic Book Centre, 1979.
- CII Reports – Consolidated Recommendations on the Islamic Economic System (1983, 1994)- the Council of Islamic Ideology, Govt. of Pakistan.
- Siddiqui, M.N.- (1985)- Muslim Economic Thinking - Leicester, The Islamic Foundation, UK.
- Mannan M.A. (1995), Developing a System of Financial Instruments IRTI, Islamic Development Bank, Jeddah.

ECON 408 Research Paper

3 Cr. Hrs.

Course Contents

The basic objective of the research paper is to train the students in the application of the different principles of economics.

OPTIONAL COURSES

ECON 001 General Equilibrium and Welfare Economics

3 Cr. Hrs.

Course Contents

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 Press, 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)

ECON 002 Human Resource Development

3 Cr. Hrs.

Course Contents

Introduction and Basic Concepts.

Basic Concepts, Meanings and Definitions of HRD by various Economists. Human Capital Formation and HRD. Significance of HRD to wards economic development. Brief Historical background of HRD. Theories of HRD by T.W. Schultz, Kuznets and modern economists. Factors of HRD. Education, Science and Technology as factors of HRD, its role in HRD, Social and Economic rate of return to Education

HRD and Needs.

Food, Health, Nutrition and Clean drinking water as factor of HRD. Its impact on HRD.

Training and Skill development a component of HRD, its various forms and role in HRD.

Migration: Needs and Impacts.

Migration, its kinds and causes, impact on HRD, Brain Drain problem in LDC's, its impact on economy, migration of labour force, remittances and its impact on HRD and economic development .

WTO and Labor Migration.

Information, Globalization, WTO and their impact on HRD. Significance of information in HRD.

Manpower Planning & Forecasting Labor

Concept of Manpower planning, its importance, factors and other allied concepts, stages of Manpower planning, forecasting of labour force in LDC's with special reference to Pakistan

Women and Development

Role of Women in HRD, Female Labour force participations rate, Development of women for HRD, Development of HRD factors in women. Earning of women and economic development Policies / Suggestions to develop the women in Pakistan.

LIMS and Labor Issues in Pakistan

Population profiles in Pakistan. Its salient features, its role in economic development and rate of return to education in Pakistan. Measures to improve the education for HRD in Pakistan, Poverty, Unemployment in Pakistan. Labour force market information (LMIS) in Pakistan. Mismatch between the supply and demand of Labour forces in Pakistan and policies for improvement the population for HRD. Analysis of the efforts regarding HRD in Pakistan, its implications and suggestions to improve HRD in Pakistan. A comparative Study of HRD in Pakistan with other LDCS

Recommended Books

- Chaudhary M. Aslam and Hameed, A., 1989, Human Development in Pakistan, Feroze Sons, The Mall, Lahore, Pakistan
- UNDP, (Various Issues), Human Development Reports
- Ali, Karamat, 1998, Political Economy of Human Resource Development, Feroz Sons, The Mall, Lahore
- HDC, Various Issues, Human Development in South Asia, Oxford, Islamabad Pakistan.
- Khilji, Bashir Ahmad (2005) 50 years of Human Resource Development in Pakistan, Shaheen Publishers, Faisalabad, Pakistan.
- Kamal A. R, Human Resource Development in Labour Surplus Economies PDR, PIDE, Islamabad.
- Schultz. T.W. 1961 Investment in Human Capital American Economic Review, Vol.51 USA
- PIDE, 1999, Education and Earnings in Pakistan (Research Report No.177, Islamabad, Pakistan)
- Kuznets S., Human Capital and Development Issues.
- Federal Bureau of Statistics, 50 years of Pakistan, Islamabad
- Ministry of Finance, Economic Survey (Various Issues) Islamabad

- State Bank of Pakistan 2005, 50 years of Human Resources.

ECON 003 Labor Economics

3 Cr. Hrs.

Course Contents

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.

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.

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.

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.

Labor Market Discrimination

Discrimination in Labor Market: Gender, Race and Ethnicity. Efficiency Wage Theories and Coordination Failure.

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.

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.

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.

Recommended Books

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

ECON 004 Population Economics

3 Cr. Hrs.

Course Contents

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 1, Amsterdam: North-Holland, 1986.

- Becker, G. (1960), "An Economic Analysis of Fertility," in *Demographic and Economic Change in Developed Countries*, Princeton: National Bureau of Economic Research, 1960, 209-231.
- Hotz, V. J., J. Klerman, and R. Willis, "The Economics of Fertility in Developed Countries: A Survey," in M.R. Rosenzweig and O. Stark, editors, *Handbook of Population and Family Economics*, North Holland, 1996.
- Schultz, T.P. "Demand for Children in Low Income Countries," in M.R. Rosenzweig and O. Stark, editors, *Handbook of Population and Family Economics*, North Holland, 1996.
- Singh, I., L. Squire and J. Strauss (1986), "Methodological Issues," in *Agricultural Household Models: Extensions, Applications and Policy*, Baltimore: Johns Hopkins University Press, Chapter 2.
- Singh, I., L. Squire and J. Strauss (1986), "A Survey of Agricultural Household Models: Recent Findings and Policy Implications," in *Agricultural Household Models: Extensions, Applications and Policy*, Baltimore: Johns Hopkins University Press.
- Murrugarra, E. (1998). "Labor Demand and Incomplete Markets: Testing for Nonseparation on Peruvian Rural Households," Mimeo.
- Pitt, M. and M. Rosenzweig. (1986). Agricultural prices, food consumption and the health and productivity of Indonesian farmers, in I. Singh, L. Squire and J. Strauss (eds.), *Agricultural Household Models: Extensions, Applications and Policy*, World Bank.
- Behrman, J. (1996), "Intrahousehold Distribution and the Family," in M.R. Rosenzweig and O. Stark, editors, *Handbook of Population and Family Economics*, North Holland, 1996.

ECON 005 Comparative Economic System

3 Cr. Hrs.

Course Contents

Evaluation of Economic Systems

Classification of Economic Systems, Historical Development Criteria for Evaluation of an Economic System. Basic Differences between Economic System.

Capitalism

Definition, Historical Development, Pre-Requisites of Capitalism, Competitive and Monopoly Capitalism. Economic Institutions of Capitalism. Distinction between private and Public Property and

Production, Price System, Profit Maximization/Cost Minimization and Competition. Economic Decision Making under Capitalism. Evaluation of Capitalism in USA and Europe Capitalism, Market System and Environmental Problems.

Communism and Socialism

Meaning and Nature, Communism and Power to the Centre. Concepts of Ownership and Production. Various types of Communism, Marxism, Socialism, Economic Planning and Decision Making. Achievements and Failures, Communism / Socialism in USSR, China and Other parts of the World. Modern Trend and its failure, Convergence of Capitalism and Socialism. Present Status of Socialism.

Economic System of Islam

Distinctive Features, Basic Economic Values of Islam. Economic Institutions and their Role, Property Rights, Production and Distribution System. The Concept of Welfare State. Comparative Analysis: Islamic System, Capitalism and Communism.

Economic System in Pakistan

Brief Economic History of Pakistan. The Mixed Economy, Nationalization and its Impacts. Operations under Mixed Economy, Privatization and Liberalization in the 1990's and 2000's. Islamisation in Pakistan: Process and Problem, Achievements and Experience. Islamic Economics as Global System of Equity and Welfare.

Recommended Books

- Capitalism, Socialism and Islam by Syed A. Ala Maududi, Islamic Book Publisher, Lahore.
- Comparative Economic System by William, Louks and William G. Whitney (latest edition).
- Comparative Economic Systems by Martin C. Schmelzter and James W. Hordyke (1977).
- Economic System of Islam by M. Omer Chapra.
- Islam or Socialism by Wilicaynaki.
- Comparative Economic Systems by Gregory, Stuart, Houghton Mifflin Company, Boston (1985).

**ECON 006 Project Appraisal and
Investment Analysis**

3 Cr. Hrs.

Course Contents

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.

Identify Project Benefits and Costs

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

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.

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.

Applying Discounted Measures of Project Worth

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

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.

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.

Recommended Book

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

ECON 007 Major Issues in Pakistan Economy

3 Cr. Hrs.

Course Contents

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

- Aslam M., Perspective on Development Planning In Pakistan, Allied Book Centre, Lahore, 2001-2002.
- Chaudhary M. Aslam and Ahmad Eatzaz: Globalization, WTO and Trade Liberalization in Pakistan, FerozSons, Lahore (2004).
- Chaudhary M. Aslam, Human Resource Development and Management in Pakistan, Ferozsos, Lahore (1989).
- Khan, Shahrukh R., 50 Years of Pakistan's Economy – Traditional Topics and Contemporary Concerns. Oxford Univ. Press, Karachi (2000).
- Mahbool-ul-Haq Centre for Human Development (MHCHD), Poverty Profile of Pakistan, (1989) Oxford University Press.
- Human Development In South Asia, Annual Report.
- Saeed, Khawaja Amjad, The Economy of Pakistan, Karachi: Oxford University Press, 2004.
- Zaidi, Akbar, (1999), Issues in Pakistan Economy, Oxford Univ., Press, Karachi.
- World Development Reports, World Bank.

ECON 008 Environmental Economics

3 Cr. Hrs.

Course Contents

Introduction and Awareness

What is Economics of Environment. Historical Framework for Environmental Protection. Distinction between natural resource economics and environmental economics. The Economy and the Environment. First and the second laws of thermodynamics. The fundamental balance.

Analytical Tools: An Environment

Supply and Demand Issue: Cost of Controlling Environment Benefit – Cost and its Estimation. Willingness to Pay. Equilibrium Principle Technology and Equi. Marginal Principles, Marginal Cost and Supply,

Economic Efficiency and Markets. Equity and Social Efficiency. External costs and external benefits.

The Economics of Environmental Quality

Pollution and Impacts on Human Life, quality of life and Environment Quality, General Models of Pollution Control. Emission Reduction and Equi. Marginal Principle. Long Run Sustainability through Pricing Mechanism.

Valuing the Environment and Benefit Cost Analysis

Measuring environmental benefits: Contingent valuation, the travel cost method and the hedonic approach. Benefit Cost analysis: Costs: The value of life, health, safety and risk. Pigovian Analysis, The Coase Theorem.

Economic Development and the Environment

General considerations, Environmental degradation in developing economies. Economy and Environment. The Pollution Haven hypothesis. The role of developed countries.

Environment and Pakistan

Emergence of Environment Issue in Pakistan, Industrial Waste, Urban Waste and Agricultural Issues Related to Pesticides use, Salinity and Water Logging. Urban Environmental Issues. Public and Private Efforts to Improve Environment Quality and Impacts. Air pollution in Pakistan. Public Policies and Awareness to Control Pollution. Environmental Policy and Strategy in Pakistan.

The Global Environment

Ozone Depletion, The Economics of Global Warming. Keyoto – Protocol and Issues. International Environmental Agreements. UN and Environmental Cooperation. International trade and the Environment. Impacts of Awareness Policy.

Recommended Books

- Field, B.C and M.K Field, Environmental Economics: An Introduction (3rd Edition) 2002 New York: Mc Graw Hill
- Barry C. Field, Environmental Economics, An Introduction, McGraw Hill (Latest Edition).
- Chapman, D. Environmental Economics : Theory Application and Policy, Latest eds. Massachusetts: Addison- Wesley
- Hussen A. (2003), Principles of Environmental Economics, Routledge Publishers.

- Baker Steve, Environmental Economics, (2003) Dominant Publisher and Distributors, New Delhi.

ECON 009 Operations Research

3 Cr. Hrs.

Course Contents

Introduction

History, Meanings and introduction to Operations Research. Art of modeling and phases of Operations Research. Discussion on different types of Operations Research models.

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.

Duality and Sensitivity Analysis

Definition of the dual problem. Primal Dual relationship. Economic interpretation of duality. Sensitivity Analysis.

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.

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.

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.

Dynamic Programming

Elements of the Dynamic model. Examples of dynamic programming models and computations.

Recommended Books

- Bunday, Brian D. "Basic Linear Programming," 1st edition, 1984, Edward Arnold.
- Gillet, Billy. E. "Introduction to Operations Research, " 1st edition, 2001, McGraw Hill
- Hamdy Taha. A. "Operations Research An Introduction," 7th edition, 2002, Prentice Hall.
- Hillier and Lieberman. "Introduction to Operations Research," 7th edition, 2002, McGraw-Hill.
- Wagner, Harvey. M., "Principles of Operations Research," 2nd edition, 2001, Prentice Hall.
- Dimitris Bersimas and John N. Tsitsiklis, "Introduction to Linear Optimization" 2nd edition, 1997, Athena Scientific.
- Fryer M. J. "Introduction to Linear Programming and Matrix Game Theory". 1st edition 1978, Edward Arnold.
- Gass M. J. "Linear Programming Methods and Application" 1st edition, 1975, McGraw Hill.
- Paul-A-Jensen and Jonathan F. Brad "Operations Research Models and Method" 1st edition, 2002, Wiley.
- Wayne Winston "Operations Research Application & Algorithm" 3rd edition 1994, Duxbury Press.

ECON 010 Dynamic Macro Economics

3 Cr. Hrs.

Course Contents

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, Journal of Monetary Economics, 38, 469-494
- Ljungqvist, L. and T. Sargent, 2000, Recursive macroeconomics theory, MIT Press, Cambridge, Massachusetts and London, England.
- Marimon, R. and Scott A., 1999, Computational methods for the study of dynamic economics, Oxford University Press.
- McCandless G. and N. Wallace, 1991 Introduction to dynamic macroeconomic theory, an overlapping generations approach, Harvard University Press.
- Rros-Rull J., 1993, working in the market, working at home and the acquisition of skills: a general-equilibrium approach, American Economics Review 8, 893-907.
- Taylor, J and M. Woodford, 1999, Handbook of macroeconomics, Volume 1C, Elsevier.

ECON 011 Monetary Economics

3 Cr. Hrs.

Course Contents

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 Economic 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

- Bennett T. McCallum, (1989), Monetary Economics, Theory and Policy, McMillan.
- Fredric S. Mishkin, (1995), Financial Markets and Money, Harper & Row Publishers.
- Laider, David E.W (1996), The Demand for Money: Theories, Evidence and Problems (Fourth edition), Harper & Row, Publishers, New York.
- Miller, R. L. and David VanHose, (2001), Money, Banking & Financial Markets. South Western, Singapore.
- Mishkin, Frederic S., (2001), The Economics of Money, Banking and Financial Markets. (Sixth edition). Addison Wesley, New York.
- Vanish K., Monetary Theory, (2000), Vikas Publishing House, Delhi.
- Patinkin Don, Money, Interest and Prices, Harper and Row Publishers, (Latest Edition).

ECON 012 Monetary Policy

3 Cr. Hrs.

Objective: This course aims to provide a fundamental understanding of the most basic questions in monetary economics: What is the role of money? What causes inflation? How does monetary policy affect output? Insights into these questions underline some of the most important developments in macroeconomics in the 20th century. This course will examine that how knowledge from the monetary conduct the monetary policy in a more scientific and 'optimal' way, at least conceptually. This course will also discuss issues related to credit and banking, as well as other non-resolved current issues in monetary economics that have been of interest to academics and policy makers in recent years. ECON 012 will offer as an upper level theory course. As such, much of the course will be analytical in nature. The treatment of these topics will be at an advanced and sophisticated level, set in the context of fully specified monetary models with micro-foundations. Focus will be on depth rather than scope, so we would spend time learning important issues in details rather than trying to be comprehensive in coverage. Students are expected to read first-rate journal articles in order to sharpen their analytical adeptness, and to familiarize themselves with the theoretical way of thinking about economics.

Contents:

Time Inconsistency: Inflation bias of discretionary policy, solutions

The Mechanics of Monetary Policy: Monetary Operations, Monetary Transmission Mechanism

The Science of Monetary Policy: Monetary Policy framework, Optimal monetary policy, inflation targeting

Current issues in monetary policy: Liquidity trap, great moderation, roles of asset prices, Fiscal Monetary-Exchange rate policies mix.

Recommended Books

- There is no single set textbook. Good undergraduate-level expositions on many topics to be covered can be found in:
- Bruce Champ and Scott Freeman (2001) Modeling Monetary Economies, Cambridge University Press, 2nd Edition
- Carl Walsh (2003) Monetary Theory and Policy, 2nd Edition, MIT Press,
- Michael Woodford (2003) Interest and Prices: Foundations of a Theory of Monetary Policy, Princeton University Press.
- David Romer (2000) Advanced Macroeconomics, 2nd Edition McGraw-Hill.
- Olivier J. Blanchard, and Stanley Fischer (1989) Lectures on Macroeconomics, MIT Press.

ECON 013 Fiscal Policy

3 Cr. Hrs.

This course will discuss the impact of Fiscal policy on individual behavior and the macro economy. The goal of this course is to develop and use a dynamic theoretical model of individual decisions and study how government tax and transfer policies, government debt and deficits affect these decisions.

Course Contents:

Facts about Deficits and Debt, Comparative Statics and Borrowing Constraints, The General Life Cycle Model, The Government Budget Constraint, Ricardian Equivalence: Origin, Results and Assumptions, Fiscal Situation of developing World, Consumption, Labor and Capital Taxation, Social Security and Social Insurance, Fiscal and social policy, Poverty, income distribution and socio-economic development in SA: fiscal and social policy issues, Public debt and budget deficits, . Intergovernmental fiscal relations, Fiscal federalism

Recommended Books

- Auerbach, A. and L. Kotlikoff (1987), Dynamic Fiscal Policy, Cambridge

- University Press.
- Burda, M. and C. Wyplosz (2001), Macroeconomics, A European Text, 3rd Edition, Oxford University Press.
- Lord, W. (2002), Household Dynamics, Economic Growth and Policy, Oxford University Press.
- Rosen, S. (2002), Public Finance, 6th Edition, Mc-Graw-Hill.

ECON 014 Rural Development

3 Cr. Hrs.

Objectives

Introduction of the structure of the rural economy encompassing socio-economic set up, developmental status and core social, economic and environmental problems to the students. Impart knowledge to the students about the historical background, evolutionary planning process of rural development & familiarization of students with the rural scene of Pakistan.

Course Contents

Structures of Rural Economy: Land, People and Resources. Socioeconomic and Political Organizations. Modes, Means and Relations of Production. Potential for Development. Basic Problems Including Traditions, Power Structure, Illiteracy, Poor Health, Unemployment, Poverty, Underdeveloped Infrastructures and Environmental Degradation.

Theories of Rural Development: Basic Needs and Community Development. Modernization of Agriculture. Diversification of Rural Economy. Rural-Urban Nexus of Development and Other Approaches.

Rural Development Planning: Rural Integrated Development Program Including Location, People, Utilities and Services, and Infrastructures. Village Aid Program. Rural Development through Local Government. Rural Development through NGOs. Rural Resource Allocation.

Rural Development in Pakistan: Historical Background, Introduction, Rural Scene in Pakistan, Land Reforms, Government Plans and Policies, Peoples Participation, NGOs and RSPs Vision in Rural Development, Rural Development Strategy. Design and Evaluation of Rural Development Projects. Rural Development Programs Before and During Eighties. Rural HRD. Local Organizations for Rural Development. Role of Voluntary Agencies in Rural Development. Use of Improved

Technologies, Poverty in the Non-Modern Sector. Impact of Integrated Rural Development Programme (IRDP). Impact of Rural Support Programmes (RSPs) on Rural Households.

Recommended Books

- Malcolm Moseley, Rural Development: Principles and Practice, Sage Publications 2003
- Young, F/Clark, J., Interdisciplinary Theories of Rural Development, Jai Press 2006
- Hasan, Ibnul, Integrated Rural Development in Pakistan, Sterling Press Limited 1989
- Kator Singh, Rural Development: Principals and Policy Institute of Rural Management (1999)
- Desilva, G. Haque, Towards A Theory of Rural Development, Progressive Publishers 1988
- James, Jeffrey, Improving Traditional Rural Technologies, Macmillan Press 1989
- Kenneth Lynch, Rural Urban Interaction in the Developing World, Routledge 2005
- Khan, Mahmood Hasan, Community Organizations and Rural development, Vanguard 2001
- Khana, B., Rural Development in South Asia, Deep & Deep Publications 1992
- Khanna, B., Rural Development in South Asia, Deep and Deep Publication, New Delhi
- Shoaib Sultan Khan, Rural Development in Pakistan, Vikas Publishers, 1982
- The African Development Bank, African Development Report 2002, Oxford 2002
- World Bank, Agriculture and Rural Development, Washington D.C. 2005
- Dar, S. U, Impact of Integrated Rural Development Programme, Anmol, New Delhi 1992

ECON 015 International Trade Policy

3 Cr. Hrs.

Objectives

The aim of the course is to introduce the students into the main facts of the theory of international trade, as well as to demonstrate principles of applying basic models

Course Contents

Introduction. The aims and the plan of the course.

The subject of International Trade. The main questions and puzzles: the structure of international trade and the world price ratios. The role of the government in the processes of international trade. The outline of the course.

1. Autarky equilibrium and the gains from trade.

The basic facts of the General Equilibrium theory. Autarky equilibrium. Theorems on the gains from trade. The comparative advantage principle in strong and weak forms.

2. Comparative advantage and technological differences.

The Ricardo's model. The relationship between the per-unit labor costs and the autarky prices. The Ricardo-Viner model. Generalizations. The testing of the Ricardo's model.

3. Comparative advantage and the factors of production.

The hypothesis of relative abundance of a factor; measures of abundance.

The notion of a good associated with a given factor. The Heckscher-Ohlin Model. The Stolper-Samuelson and the Rybczynskii theorems. The verification of the Heckscher-Ohlin model: the Leontieff's paradox. The influence of international trade on the income distribution and the Heckscher-Ohlin model. The weak form of the relative abundance hypothesis for the general model: local and global versions. The factor price equalization issues.

4. Comparative statics & the factor movements between countries.

Is it possible that a country becomes better off by making a unilateral gift of a certain good to another country? Immiserizing growth. The direct investment effect. Multinational corporations. The effect of the labor migration on the international equilibrium.

Recommended Books

- Dixit, A.K., Norman, V. (1992). Theory of International Trade. Cambridge University Press.
- Krugman, P.R., Obstfeld, M. (1994). International Economics. Theory and Policy. Harper Collins College Publishers.
- Kenen, P.B. (1994). The International Economy. Cambridge University Press.
- Bhagwati, J.N., Srinivasan T.N. (1994). Lectures on International Trade. The MIT Press, Cambridge MA.
- Falvey, R.E. (1994). The Theory of International Trade. In: D.Greenaway, L.A.Winters (eds). Surveys in International

Trade,
Blackwell Publishers, Oxford, 1994, pp. 9-43.

- Leamer, E.E. (1994). Testing Trade Theory. In: D.Greenaway, L.A.Winters (eds). Surveys in International Trade, Blackwell Publishers, Oxford, 1994, pp. 66-107.
- Laussel, D., Montet, C. (1994). Strategic Trade Policies. In: D.Greenaway, L.A.Winters (eds). Surveys in International Trade, Blackwell Publishers, Oxford, 1994, pp. 177-206.
- Krugman, P.R. (1994). Rethinking international Trade. Cambridge: The MIT Press.
- E.Helpman and P.R.Krugman (1994). Trade Policy and Market Structure. The MIT Press, Cambridge, Massachusetts (ch. 5-7).
- K.H.O'Rourke, A.M.Taylor, J.G.Williamson. (1996). Factor Price Convergence in the Late Nineteenth Century. International Economic Review, v.37, N.3, August, 499-529.

ECON 016 International Finance

3 Cr. Hrs.

Course Contents

Introduction.

Introduction to international finance, International institutions, Funding Mechanism of International Institutions, Mechanisms and institutions for financing.

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, Forward Exchange Rate Policy.

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. Monetarist Critique to the Keynesian Closed Economy Model. B.O.P. Effects of Stabilization Policies. Empirical Tests of Monetary Approach to the B.O.P. WTO and B.O.P Support. Adjustment with Short-run capital Flow. Methods dealing with undesired Short-run Capital Flow.

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. Fiscal Policy and Temporary Payment Imbalances. Monetary Policy and Permanent Payments Imbalances, A Random Walk Model of Payment Imbalances. Critical Review of the Modern Theory and Adjustment Mechanism.

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.

International Movements of Factors and Welfare: Impacts / Issues

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. Losses of National Sovereignty. Can Developing Countries Compete and Gain from Trade: Terms of Trade due to Demand Pattern and its Impacts. What Counts for wage Differential Between Primary Goods Producer and Value Added Goods Producer, Competitiveness Issue.

International Institutions and Flow of Capital

WTO: GATT and Emergency of WTO. Why necessary to Join WTO? WTO: Expected Impacts on Trade, Liberalization and B.O.P; Special Status of Developing Countries and Net Food Importing Countries. Protections under WTO Rules. Are Free Trade Gains more than Restricted Trade? Gains for whom; how much and how long? Centre-Periphery Theory.

ECON 017 Development Policy**3 Cr. Hrs.****Course Contents****International Debt, Aid/Assistance, and New Role of World Bank and IMF**

Why international borrowing? Two Gap Model, Aid commitments and disbursement. Sources of borrowing. Debt Cycle Theory/Stages. Debt Burden: Debt Servicing, Debt ladder 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. Solution to debt Problem.

Resource Mobilization and Industrialization

LDC's Inflation and Deficit B.O.P Problem. Savings and forced savings. Direct and indirect taxation, Transfer of resources from agricultural to industry. Migration and its role. Urban unemployment. Industrialization and Small Manufacturing enterprises (SME's). Human Capital and its development / productivity.

Multinational Corporations (MNC'S), FDI and Development

Multinational Corporations (MNC's): Objectives, Role and Contributions, Long term cost of TNC's. Transfer of Technology: Ways and Means. Global integrated production system: MNC's and Globalization, Foreign Direct Investment (FDI) and Its Determinants/Role. Foreign Direct Investment (FDI) and MNC'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.

WTO, Liberalization and International Trade

Trade vs. Aid. Liberalization of Trade and its impacts/gains etc., Trade led Growth, 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.

Growth Models

Harvard – Dormer Model, Neo-classical growth theory, Technical change, endogenous growth. Institutional Economics, Institution's and Market, Good Governness, Role of Institutions in Economic Development. Institutions and LDC's.

Recommended Books

- Meier, Gerald M. and James E. Rauch. 2000. *Leading Issues in Economic Development*. Seventh Edition. Oxford University Press.
- Todaro, Michael P. and Stephen C. Smith. 2003. *Economic Development*. Pearson Education Limited.
- Allen, Tim and Alan Thomas. 2000. *Poverty and Development*. Second Edition. Oxford University Press
- Stiglitz, Joseph and Gerald Meier. 2001. *Frontiers of Development Economics: The Future in Perspective*. Oxford University Press/The World Bank

ECON 018 Institutional Economics

3 Cr. Hrs.

Objective: A course in "Institutional economics" accomplishes a series of courses that constitute the basic training for economists. Before studying institutional economics students should master not only the fundamentals of general economic theory but have knowledge of the historical courses and humanities as well.

Pre-Requisite : It is assumed that the students should be familiar with the following courses: Microeconomics and Macroeconomics, game theory, industrial organization, economic history and history of economic thought.

1. Introduction to institutional analysis ; The concept of institution: attempts at definition. Institutions and organizations. Functions of social institutions. Interaction situations and the types of norms: prisoners' dilemma-type situation; co-ordination situation; inequality situation. Enforcement characteristics. Institutional

structure of a society. Formal and informal institutions. Sanctions for disobeying norms (self-enforcing sanctions, guilt, shame, informational sanctions, bilateral costly sanctions, multilateral costly sanctions). Conditions of norms' effectiveness. Interaction of formal and informal institutions. The limits of imitations of institutions from best-performing countries. The problems of their enforceability. The New Institutional Economics and modern institutionalism. Old institutional economics.

2. Transaction costs: The concept of transaction. Market and intrafirm transactions. Transaction costs as friction in the economy. Transaction costs and transformation costs. Interdependency between transaction costs and transformation costs. Types of market transaction costs and means of transaction costs minimization(search and information costs; measurement costs; bargaining and decision costs; supervision and enforcement costs). Comparative advantages and shortcomings of the legal enforcement mechanism. Reputation as a contract enforcement device. Ideal model of "perfect reputation". Shortcomings of the reputation as a contract enforcement mechanism. Reputation and the "free rider problem". Reputations aided by institutions. Contract enforcement in contemporary Russia.
3. The definition of property rights. Property rights in different legal traditions (common law and civil law traditions). The property rights approach: some basic concepts. Specification of property rights, the bundle of rights, partitioning of property rights, attenuation of property rights. Assigning of property rights: the internalization of externalities. The Coase Theorem. Critic of Coase (dynamic effects of alternative legal rules, wealth effect, distributional effects, strategic behavior and the problem of holding-out, endowment effect, sociological critic, unrealistic assumption about zero transaction costs). Alternative property rights regimes. Common property (open access) and the tragedy of the commons. Exclusive property rights and the conditions for their emergence. The first economic revolution. Communal property. Optimal group size. Private property. Moral and economic aspects of private property. Public property. The emergence of property rights. The optimistic theory of the emergence of property rights (naive model). The interest-group theory of property rights. The costs of collective action. The theory of rent-seeking. Interest-groups and rent-seeking in the Russian economy.

4. Contracts: The definition of a contract. Legal and economic approach to contracts. Freedom of contract. Bounded rationality and contractual incompleteness. Asymmetric information (hidden characteristics, hidden information/ hidden action, hidden intentions) and opportunistic behavior. Adverse selection and the closing of markets. Signalling, screening and self-selection. Asset plasticity and moral hazard. Principal-agent problem and agency costs. A simple principle-agent experiment in the classroom. Controlling and preventing moral hazard (controlling the agent, incentive contracts, bonding, do-it-yourself method). Case study: crisis of the savings and loan associations in America as an example of moral hazard in financial markets. Attributes of transactions and the choice of a contract. Asset specificity, types of specific assets. Synergy effects, quasi-rents appropriation and hold-up problem. Classification of contracts (classical, neoclassical and relational contracting). Discrete alternative governance structures: market, hybrids and hierarchy. Self-enforcing agreements (Telser) and hostages (Williamson). Hybrids: specific assets and their safeguards. Institutional environment and its role in the choice of contract. GM and Toyota: different models for solving the problem of safeguards for specific investments. The role of trust. Economic approach to trust. Kreps: the trust game. Types of trust (contractual trust, competence trust and good will trust). Explaining the internal structure of formal organizations: transaction costs approach.
5. The new institutional theory of the firm: Neoclassical theory of the firm. Explanations of the firm in the new institutional theory (F.Knight, R. Coase, A. Alchian and H.Demsetz, O.Williamson, O.Hart). The market and the firm. Comparative analyses of the alternative coordination forms. Internal market and influence costs. The boundaries of the firm. Ownership structure of the firm. A theory of the owner-monitor. Competing forms of economic organization, relative advantages of alternative structures (proprietorships, partnerships, open corporation, regulated firms, public enterprises, nonprofit organizations, labor-managed firms). Separation of ownership and control in the open corporation. Opportunistic behavior of the managers and corporate control. Outsider and insider corporate governance. Privatization in Russia and other transition economies: how to control the managers.
6. The new institutional theory of the state: Social mechanisms for constraining open access. Contractual theories of the state (Locke, Rousseau), Hobbes predatory theory of the state.

North's model of the state. The regulatory role of the state in the Russian economy.

7. The theory of institutional change: Stability of institutions and institutional change. The concept of institutional equilibrium. The main sources of institutional change. Centralized and spontaneous institutional change. The role of the state in the process of institutional change. The problem of compensation of the disadvantaged groups. Theories of selection of efficient institutions in the process of competition (Alchian, Friedman). Institutional change and path dependence. Forms of path-dependence (weak form, semi-strong and strong forms). Institutional change in contemporary Russia.

Recommended Books

- Akerlof G.A. (1984) The Markets for "Lemons": Quality Uncertainty and the Market Mechanism" 84 Quarterly Journal of Economics, pp. 488-500
- Alchian A., Demsetz H. (1972) Production, Information Costs and Economic 52 The American Economic Review, pp. 777-795
- Coase R. (1937) The Nature of the Firm. 4 Economica, pp. 386-405
- Coase R.H. (1960) The Problem of Social Cost. 3 Journal of Law and Economics 1-44
- Dahlman C. (1979) The Problem of Externality. 22 Journal of Law and Economics, pp. 141-162
- Eggertson Thr. Institutions and Economic Behavior.
- Hart O. (1989) An Economist's Perspective on the Theory of the Firm. 89 Columbia Law Review, p. 1757
- Joskow P. (1987) Contract Duration and Relationship-Specific Investments: Empirical Evidence from Coal Markets. 77 American Economic Review pp. 168-173
- Milgrom P., Roberts J. Economics, Organisation and Management.
- Milgrom P., Roberts (1992) J. Economics, Organization and Management. - Prentice-Hall Int.,.
- North D. (1990) Institutions, Institutional Change and Economic Performance. Cambridge University Press,
- Posner R. (1997) Social Norms and the Law: an Economic Approach. 87 American Economic Review, pp. 365-369
- Rose C. Evolution of Property Rights. In: Newman P. The New Palgrave Dictionary of Economics and the Law. Vol. 2,.
- Tullock G. Rent-seeking. (1987) In: The New Palgrave: A Dictionary of Economics. - L., Macmillan, 1987,

- Varian H. Intermediate Microeconomics. A Modern Approach.

ECON 019 Financial Institutions and Markets

3 Cr. Hrs.

Course Contents

Theory of the Role and Functioning of Financial System

Information asymmetric and the need for the role of financial sector. Some Basic concepts like adverse selection, moral hazard, free rider and principal-agent problems in financial sector to understand puzzles of financial markets. Financial system and its relationship with the rest of the economy. Functions of financial sector: mobilization and allocation of resources; pooling, diversification and trading of risk; advisory role; financing technological innovation and development. Financial Repression vs Financial Liberalization.

Growth and stability of financial system.

Why there is need to regulate the financial sector? Why financial sector is most regulated one in an economy? State Bank of Pakistan and its main functions: conduct of monetary policy; promotion, establishment, regulation and supervision of depository institutions; exchange rate policy and management of foreign exchange reserves; Payment System (NIFT And its functions. Relating to payments system). Securities and Exchange Commission of Pakistan and its functions: promotion, establishment, regulation and supervision of various components of capital market .

Financial Institutions and Current issues

- i) Scheduled Banks and their role in economic development of Pakistan: Introduction to commercial banking; structure of commercial bank in Pakistan; Assts and Liabilities of a commercial bank; performance indicators for commercial banks; recent issues in commercial banking.
- ii) Non-bank Financial Institutions: Development Financial Institutions, Investment Banks, Modarbas, Leasing companies, Mutual Funds, Housing Finance Corporations, Discount Houses, Venture Capital Companies.
- iii) Micro Finance Institutions, SME Banks
- iv) Insurance Companies – the rationale and role.

Financial Markets and Current Issues

- i) Functioning of Money Market (Primary and Secondary Dealers
- ii) Capital Market (Stock exchanges and Various Components of capital markets – Securities, equities, bonds, debentures)
- iii) Foreign Exchange Market and its evolution, dollarization of the economy.

Financial Infrastructure

Legal Framework (SBP Act 1956, BCO, 1984, SBP Prudential Regulations), Accounting Standard, Auditing, Corporate governance of banks and other financial institutions. Human Resource Development (Skill and Training) – Importance for functioning of financial sector. Electronic Banking and its prospects

Recommended Books

- Fabozzi, F. and Modigliani, F. Capital Markets. 2nd edition. Prentice- Hall London (1996).
- Mishkin (2003), The Economics of Money, Banking, and Financial Markets. 7th edition.
- Ritter, L. S. and Peterson, R.L. Financial Institutions and Financial Markets. 9th edition. New York. Basic Books.
- Arby, Muhammad Farooq (2004), "Functions, Evolution and Organization of State Bank of Pakistan" www.sbp.org.pk
- History of State Bank of Pakistan (Volume – 3, chapters 2 to7, 13).
- Zaidi, Akber (2005), "Issues in Pakistan Economy," Karachi. Chapters12, 13
- SBP Annual and Quarterly Reports
- SBP Financial Sector Assessment: 1990-2002, 2003 and onward.

ECON 020 Game Theory

3 Cr. Hrs.

Pre-requisite

Mathematics and Statistics

Objectives

The course is dealing with some topics in repeated games. The special attention is devoted to the issue of cooperation among the players when they do not observe the actions of each other.

Course Contents

Introduction to Repeated Games and Folk Theorems. Cartel Equilibria as example of Imperfect Public Monitoring. Folk Theorems with Imperfect Public Monitoring. Folk Theorems with Imperfect Private Monitoring. Communication in Private Monitoring Games.

Recommended Books

- Abreu, D. and D. Pearce and E. Stacchetti, "Optimal Cartel Equilibria with Imperfect Monitoring," JET, 39, 1986, 251-269
- Abreu, D. and D. Pearce and E. Stacchetti, "Toward a Theory of Discounted Repeated Games with Imperfect Public Monitoring," Econometrica, 58, 1990, 1041-1063
- Compte O., "Communication in Repeated Games with Imperfect Private Monitoring," Econometrica, 66, 1998, 597-626
- David M. Kreps "Game Theory and Economic Modelling". Oxford University Press.
- Ely, J. and J. Valimaki, "A Robust Folk Theorem for the Prisoner's Dilemma," JET, 102, 2002, 84-105
- Fudenberg, D. and J. Tirole "Game Theory", MIT Press, 1996, Ch. 4,5
- Fudenberg, D., D. Levine and E. Maskin, "The Folk Theorem with Imperfect Public Information," Econometrica, 62, 1994, 997-1040
- Green, E. and Porter R., "Non cooperative Collusion Under Imperfect Price Information," Econometrica, 52, 1984, 87-100
- Kandori M. and Matsushima H., "Private observation, communication and collusion," Econometrica, 66, 1998, 627-652
- Kandori M., "Introduction to Repeated Games with Private Monitoring," JET, 102, 2002, 1-15
- Mailath G., and S. Morris, "Repeated Games with Almost-Public Monitoring," JET, 102, 2002, 189-228
- Martin J. Osborne "An Introduction to Game Theory". Oxford University Press.
- Porter, R., "Optimal Cartel Trigger-Price Strategies," JET, 29, 1983, 313-338.

ECON 021 Managerial Economics

3 Cr. Hrs.

Course Contents

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.

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 Maximax Criterion, Maximin Criterion and Minimax regret 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, Monopsony and Price Product.

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.

Recommended Books

- Douglas, E. J., Managerial Economics, Prentice Hall, (1990).
- Hirschey, M. Managerial Economics, (10th edition) U.S.A. Thomson South-Western, (2003).
- Hirschey, M. and J.L. Pappas; Fundamentals of Managerial Economics, Dryden Press, (1998).
- Kent P, and P Young., Managerial Economics: Economic Tools for Today's Decision Makers., (4th Edition) Pearson (2003).
- Keat, P., and P., Young, Managerial Economics, MacMillan, (1992).
- Koutsoyiannis, A., Modern Microeconomics, MacMillan, (1979).
- Mansfield E., (1998), Managerial Economics, Theory, Application and Cases. W. W. Norton & co.
- Michael R., Baye (2000) Managerial Economics and Business Strategy, McGraw Hills.
- Pappas, James, Brigham Eugene F and Hirschey Mark., (latest edition), Managerial Economics, Dryden Press, Chicago.
- Salvatore, D. Managerial Economics, McGraw Hill, (2001).
- Thomas, Maurice., Managerial Economics: In a Global Economy (7th Edition) New York: McGraw Hills, (2002).

ECON 022 Political Economy

3 Cr. Hrs.

Course Contents

Introduction

Meaning, Definition and brief Introduction of basic Concepts of Political Economy. Economic and Political Integration. Policy Reform and Popular Organization, key Social and Economic indicators. Political and Economic Institutions and their role in decision making. Linkages of Politics and Economics. Conceptualizing the Changing Global Order.

Political Economy and World Order

Problem of Power and Knowledge: New Millennium, Knowledge, Politics and Neo-Liberal Political Economy.

New Voices in the Globalization Debate: Green Perspective, Regional Phenomena and State Order, New State Actors, Theory of Exclusion.

Regional Dynamics

Regionalism and Globalization, The Political Economy of European Integration, Regionalism in the Asia-Pacific Political Globalization and the Competition State. Economic Blocks and Political Blocks.

Political Economy of Economic Development

International Politics and Transfer of Technology, Sector Specific Development Limitation. Agriculture and Industry, Political Slogans and their Implementation, International challenge of poverty, The Political Economy of food grain prices, Rural Development. Regional Exporting Blocks and their Markets.

Political Economy of Pakistan

The Economics of Patronage, Seven Pillars of good Governance. The Political Economy of Reforms. Pakistan - Dynamics of Elitist Model. Strategies for self-preservation, A military Theocracy, Different Regimes, Economic Development, Ethnic conflict, the Role of State. Emerging Economic and Political Issues and their linkages. Regionalism, Poverty and Governance etc.

SAARC: Political & Economic Aspects

Economic Aspects, Poverty Eradication, Trade & Economic Cooperation, Cooperation with Regional NGO's in South Asia. Pakistan and SAARC: Composition of Trade, Foreign Trade Trends in External Trade, Direction of Foreign Trade, Trends of Trade with SAARC. Future Economic Prospects of SAARC.

Issues in Lawlessness and Development

Introduction, Economic Crimes, Terrorism & Insurgency, Theories of the Economic impact of Law & Order.

Socio Economic Developments & Crime

A Review of Socio-Economic Situation in Pakistan, Urbanization, Housing, Unemployment, Poverty, Juvenile Delinquency, Health Hazards. Environment and Externalities.

Global Issues

Global Issues in Historical Perspective, Capital Mobility and Global Order, Opening up of Services Sector and its beneficiaries. Will there be free mobility of factors of production? Capital, labor and entrepreneurs etc. Multinationals: Objectives, Contribution and their Mobility. Emerging World Financial Order. The Group of Seven and Political Management of the Global Economy, Big Businesses and New Trade Agreements, Trade Blocks.

Recommended Books

- Azhar, H. Nadeem (2002), Pakistan: The Political Economy of Lawlessness, Oxford University Press.

- Gupta, S. Dev, The Political Economy of Globalization, Kluwer Academic Publishers. (Latest eds.)
- Hagen Everett E., The Economics of Development, Richard D. Irwin, Inc. (Latest eds.).
- Hussain Ishrat, (2004), Dollars, Debt and Deficits, Reform and Management of Pakistan Economy, Oxford University Press.
- (1999), Pakistan, the Economy of an Elitist State, Oxford University Press.
- Kardar Shahid, The Political Economy of Pakistan, Progressive Publishers, Pakistan.(Latest eds.).
- Kher, R.S. (2004), SAARC: Political & Economic Aspects, Dominant Publishers and Distributors.
- Noman Omar (1988), The Political Economy of Pakistan 1947-1985, KPI, London and New York.
- Stubbs Richard and Underhill Geoffrey R.D., (2000), Political Economy and the Changing Global Order, Oxford University Press.
- Szentes J., The Political Economy of Underdevelopment, Akademiai Kiado, Budapest. (Latest eds.).

ECON 023 Industrial Economics

3 Cr. Hrs.

Objectives

The course analyzes the problems of the real economy that cannot be described within the framework of a classical economic theory that is taught by traditional micro- and macroeconomics. This course will cover all the three main fields of industrial organization theory: the theory of a firm, the theory of imperfect competition, and the theory of economic regulation. The students are presumed to be familiar with the standard courses in micro- and macroeconomics at the graduate level.

Course Contents

Theory of a firm: What is the firm and why is it organized? A firm as an alternative to a market. Transaction costs theory explaining appearance of firms. Production scale, specialization level and advantages of firms as a means of production.

Hierarchical firm structure and its efficiency. Optimal size of a firm (of a number of hierarchical levels). Hierarchical firm structure under oligopoly.

Consumer Surplus and Public Welfare

Estimation of public welfare within the framework of partial equilibrium analysis. Quasilinear utility function and measure of public welfare. Compensated and equivalent variations. Public welfare and Hicksian and Marshallian demand functions. Consumer surplus as an approximate measure of public welfare.

Economic Theory of Bundling

Bundling as a marketing tactics. Price discrimination and bundling. Heterogeneous consumers. Pure components strategy, pure bundling strategy, and mixed bundling strategy. Superiority of mixed bundling relative to pure bundling. Conditions for mixed bundling strategy to be dominant over pure components strategy. Independent distribution of reservation prices. Homogeneous consumers. Commodity bundling and consumer surplus.

Mergers and Acquisitions.

Horizontal Mergers and Acquisitions

Types of mergers and acquisitions: horizontal, vertical, conglomerates. Examples of mergers and acquisitions within the last decade. Mergers of firms with identical production costs. Condition of a merger profitability. Mergers of firms with differing production costs. Reaction of a firm to a change in output by all other firms on the same market. Condition of industry output increase, resulting from a merger. Horizontal mergers and public welfare. Herfindal-Hirshman index as a measure of public welfare. Condition under which horizontal merger results in higher public welfare.

Vertical Mergers

Effect of a vertical merger on output of final and intermediate products. Vertical mergers and market foreclosure. Vertical mergers and profits of integrated and unintegrated firms.

Product Differentiation

Location Models

Linear city, linear transportation costs. Quadratic transportation costs. Stability of equilibrium states. Circular city. Welfare implications.

Differentiated Goods, Increasing Returns to Scale, and Monopolistic Competition

Markets for differentiated goods. The problems solved by consumers and producers. Market equilibrium under free entry conditions. Effects of fixed costs and market size on product diversity and output.

Industrial Agglomeration

Phenomenon of industrial agglomeration. Increasing returns to scale as a driving force of agglomeration. External and internal mechanisms of increasing returns to scale. The role of transportation costs. A simple model of industrial agglomeration: two regions, two production factors (perfectly mobile workers and immobile farmers). Competition and market size – the main factors affecting the process of industrial agglomeration. Effects of transportation costs, fixed costs, a share of immobile factor on industrial agglomeration. Stability of distributed and agglomerated equilibria. Multiple equilibria and hysteresis.

Economics of Innovations

Model of the innovation process. Patent race. Market structure and innovation efforts. Incentives for innovations. Socially optimal and market investments into R&D. Patent life.

Imperfect Competition and Macroeconomics (1 lecture).

Theories of business cycles. Increasing returns to scale and stability of economic equilibrium. Price rigidity as a source of business cycles. Explanations of price rigidities: kinked demand curve, menu costs. Market monopolization and price rigidity. Small menu costs and large business cycles during economic booms and busts.

Externalities, corrective taxes, and market structure. Possibility of a negative effect of Pigou tax on public welfare under monopoly.

Theory of Regulation

Public costs of monopoly. Subadditivity of cost function – a necessary and sufficient condition for a natural monopoly. Economy of scale, concavity of a cost function and subadditivity. Stability of a natural monopoly.

History of regulation after World War II. When should natural monopolies be regulated? Demsetz competition for a market. Contestability of a market. Deadweight losses, sunk costs and regulation. Regulation under complete information. Price discrimination and nonlinear tariffs as a means of increasing efficiency of a regulated monopoly. Peak-load pricing. Regulating monopoly under asymmetric information. Exogenous mechanisms of regulation. Averch-Johnson model. Endogenous mechanisms of regulation. The delegation and revelation approaches.

Analysis of Particular Industries and Enterprises.

Airlines

Effects of deregulating air companies. "Hub and Spokes" system and its efficiency.

Theatres and restaurants

Why in developed market economies there are queues in theatres, restaurants, etc.? Network externalities in services consumption and nonmonotonicity of demand function. Instability of equilibrium, corresponding to profit maximization, and limitedness of prices and supply of services.

Economics of Show Business

Why relatively small number of people in show business, sports, book publishing, etc. earn a lot of money and dominate on markets? Effect of imperfect substitution: lesser talent is a poor substitute of larger talent. Dependence of demand function on quality. Increasing returns to scale in show business production. Demand and supply structure. Market equilibrium. Convexity of revenue function, depending on talent. Continuous distribution of performers on talent, and rent dissipation. Outstanding performer and rent value.

Recommended Books

- Adams W.J., and J.L. Yellen, 1976, "Commodity Bundling and the Burden of Monopoly", *Quarterly Journal of Economics*, vol. XC, 475-498.
- Averch H., and L.L. Johnson, 1962, Behavior of the Firm under Regulatory Constraint, *American Economic Review*, vol. 52, 1052-1069.
- Baron D., 1989, *Design of Regulatory Mechanisms and Institutions*, in R. Schmalensee and R.D. Willig eds.: The Handbook of Industrial Organization, Elsevier North-Holland.
- Baumol W.J., J.C. Panzar, and R.D. Willig, 1982, *Contestable Markets and the Theory of Industry Structure*, New York: Harcourt Brace Jovanovich.
- Becker G., 1991, A Note on Restaurant Pricing and Other Examples of Social Influences on Price, *Journal of Political Economy*, vol. 99, 1109-1116.
- Braeutigam R., 1989, *Optimal Policies for Natural Monopolies*, in R. Schmalensee and R.D. Willig eds.: The Handbook of Industrial Organization, Elsevier North-Holland.
- Buchanan J.M., 1969, External Diseconomies, Corrective Taxes, and Market Structure, *American Economic Review*, vol. 59, 174-177.
- Coase R.H., 1992, The Institutional Structure of Production, *American Economic Review*, vol. 82, 713-719.
- Diversity, *American Economic Review*, vol. 67, 297-308.

- Dixit A.K., and J. Stiglitz, 1977, Monopolistic Competition and Optimum Product
- Farrel J., and C. Shapiro, 1990, Horizontal Mergers: An Equilibrium Analysis, *American Economic Review*, vol. 80, 107-126.
- Krugman P., 1991, *Geography and Trade*, The MIT Press.
- Krugman P., 1991, Increasing Returns and Economic Geography, *Journal of Political Economy*, vol. 99, 483-499.
- Krugman P., 1995, *Development, Geography, and Economic Theory*, The MIT Press.
- Loury G.L., 1979, "Market structure and Innovation", *Quarterly Journal of Economics*, vol. XCIII, No. 3, 395-410.
- Mankiw G., 1985, Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly, *Quarterly Journal of Economics*, vol. 100, 529-537.
- Martin S., 1993, *Advanced Industrial Economics*, Blackwell.
- McAfee R.P., J. McMillan, M.D. Whinston, 1989, "Multiproduct Monopoly, Commodity Bundling, and Correlation of Values, *Quarterly Journal of Economics*, vol. CIV, 371-383.
- Posner R.A., 1975, The Social Costs of Monopoly and Regulation, *Journal of Political Economy*, vol. 83, 807-827.
- Rotemberg J.J., and G. Saloner, 1987, The Relative Rigidity of Monopoly Pricing, *American Economic Review*, vol. 77, 917-926.
- Salant S.W., S. Switzer, and R.J. Reynolds, 1983, Losses from Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium, *Quarterly Journal of Economics*, vol. 98, 185-199.
- Salinger M.A., 1988, Vertical Mergers and Market Foreclosure, *Quarterly Journal of Economics*, vol. 77, 345-356.
- Sharky W., 1982, *The Theory of Natural Monopoly*, Cambridge University Press.
- Shy O., 1995, *Industrial Organization*, The MIT Press.
- Tirole J., 1988, *The Theory of Industrial Organization*, The MIT Press.
- Varian H., 1992, *Microeconomic Analysis*, W.W. Norton & Company.
- Williamson O., 1996, *The Mechanisms of Governance*, Oxford University Press.
- Williamson O.E., 1981, The Modern Corporation: Origins, Evolution, Attributes, *Journal of Economic Literature*, vol. 19, 1537-1568.
- Willig R., 1976, Consumer's Surplus Without Apology, *American Economic Review*, vol. 66, 589-597.

ECON 024 Transport Economics

3 Cr. Hrs.

Course Objectives:

This course will provide students with the basic concepts and tools for economic evaluation of transportation projects and related investments. Students should obtain basic skills in the analysis of travel demand and in the valuation and analysis of transportation system benefits. Students should also be able to understand different components of the costs of transportation, basic pricing principles, and how these factors affect the market for transportation infrastructure and services. Finally, students should be able to apply these concepts to analyze transportation investment decisions.

Contents

Economic analysis of transportation projects and transportation infrastructure investment, including analysis of travel demand, benefits, costs, equilibrium, pricing, and market structure. Intro to microeconomic principles in transportation, Travel demand, Transportation costs, Pricing alternatives, Project evaluation, Congestion, Air quality, Fuel economy and safety, Transportation technology, Public transit, Land use, Transportation and economic development.

Recommended Books

- José A. Gómez-Ibáñez, William B. Tye, and Clifford Winston (editors), *Essays in Transportation Economics and Policy: A Handbook in Honor of John R. Meyer*. Washington, D.C.: Brookings Institution
- Gomez-Ibanez, Tye, and Winston, (1999) nEssays in Transportation Economics and Policy: A Handbook in Honor of John R. Meyer, , The Brookings Institution.
- Richard C. Porter, (1999) *Economics at the Wheel: The Costs of Cars and Drivers*, the
- Academic Press

ECON 025 Health Economics

3 Cr. Hrs.

This course is an introduction for advanced economics students to contemporary **theoretical analysis** of, **empirical evidence** on and **policy debate** about:

what and who produces health, how it is produced, variations in its production, consequences of its production or lack of production

Course Contents

1. Introduction

The particular problems of health and the economics of health: great uncertainty, great irreversibility, major ethical/equity concerns throughout time, the near-impossibility of separating production from distribution. Are there parallels?

2. Studies of the production of health.

What makes individuals and populations healthier or unhealthier? life expectancy mortality, morbidity and X-Adjusted Life. The distinction between the production of health and the production of health care also a distinction between the production of health and the production of utility.

3. The fundamental microeconomics of health care

Is health care really different from other commodities? Is this market failure irreparable, and what does it imply for market versus social or state provision of health care? Have we learnt more since Arrow's basic insights? Health care insurance as a special sub-topic of insurance. The health care market: Supply, demand, industrial organization. Health care as a part of public economics. Why health care is almost everywhere a topic for public economics. The alternate private/public mix which has been developed in different countries. What is happening in Russia? What could happen? How should health care systems be compared? Cost-effectiveness and the role of the economist in the health sector: an introduction. (Students interested in further applications can find them in Cost-Benefit Analysis). Measuring Health : Adjusted Life Years: QALYs, DALYS, life years. How far have we come? Can we really measure cost-effectiveness. Can we produce a single objective function? The debate over WHO rankings. How health and health care has changed in the last century, the last two decades, the last year: an international overview. Demographers' measures, particularly life expectancy. What has happened to Russian mortality in the last century, the last two decades, the last few years? Trying to quantify health care: QALYs, DALYs and WHO rankings. How is it done? What should we do now? What is the research agenda? Problems of Health Care Insurance in theory. Alternate forms of health care provision in the world, and recent changes. Trade-offs in "American" versus "European" systems. Is Health care really different from all other commodities? Are there even partial

cures for problems such as the agency problem? How much is inherent, how much is in-built institutionally?

4. **The pharmaceutical market.**
5. **Health in transition.**
6. **The future of health care reform in the world, and particularly Pakistan.**

Recommended Books

- The Economics of Health is one of the newest fields to have its own North-Holland 2-Volume Handbook, and remains somewhat unstandardized, with major variations in subject matter between countries and departments.
- Bootman JL, Townsend RJ, McGhan WF. (2005). *Principles of Pharmacoeconomics*. Harvey Whitney Books, Cincinnati.
- Drummond MF, O'Brien BJ, Stoddart GL, Torrance GW (1998). *Methods for the Economic Evaluation of Health Care Programmes*. 2nd edition, Oxford University Press, Oxford.
- Duckett SJ (2004). *The Australian Health Care System*. Oxford University Press, Oxford.
- Gold MR, Siegel JE, Russell LB, Weinstein MC (1996). *Cost-Effectiveness in Health and Medicine*. Oxford University Press, Oxford.
- Petitti DB (2000). *Meta-Analysis, Decision Analysis, and Cost-Effectiveness Analysis:*
- *Methods for Quantitative Synthesis in Medicine*, 2nd edition. Oxford University Press, Oxford.
- Rychlik R (2002). *Strategies in Pharmacoeconomics and Outcomes Research*. The Haworth Press, New York.
- Vogenburg, FR (2001). *Introduction to applied pharmacoeconomics*. McGraw Hill, New York.
- Zweifel and Breyer, *Economics of Health*, North Holland

ECON 026 Resource Economics

3 Cr. Hrs.

Objectives

This course aims to provide the students a broad introduction to the economics of natural resources and the environment. It intends to develop a systematic understanding of the economic rationale behind the optimal use of natural resources, Pricing of market and non market

resources, application of environmental policy instruments, economic valuation principles.

Course Contents

Economics and environment. Resource scarcity, prices, demand and supply of natural resources. Market equilibrium, economic efficiency, inter-temporal efficiency, property rights. The economics of pollution, natural resource exploitation. Optimal utilization of renewable and non-renewable natural resources. The economic concept of value and measurement of environmental and natural resource benefits using non-market valuation methods. Economic approaches to conservation of natural resources. Policy instruments to address resource allocation and environmental problems. Benefit cost analysis.

Recommended Books

- Randall, A. 1987. 'Resource Economics' An Economic Approach to Natural Resource and environmental Policy. John Wiley and sons, Inc. New York .
- Compathy, R. S. and R. S. Ganapatty, 1990. Natural Resource Management' Mohan Primplani for Oxford and IBH Publishing Co. New Delhi.
- Jon M.Conard. Resource Economics. Cornell university , New York
- CC - Conrad, Jon M., and Colin W. Clark, Natural Resource Economics: Notes and Problems, Cambridge: Cambridge University Press, 1987.
- HNREE-III - Kneese, Allen V. and James L. Sweeney (eds.), Handbook of Natural Resource and Energy Economics, Volume II, Amsterdam: North-Holland, 1993.

ECON 027 Experimental Economics

3 Cr. Hrs.

Objectives

This is a course in Experimental Economics, which is a growing body of research concerned with testing economic theories with decisions made by people in laboratory experiments. We will study the use of laboratory experiments as behavioral tests of economic theory, and as tools for market design.

Course Contents

- I. **Conduct of Science and Introduction**, Introduction to Experimental Economics Markets and Institutions, Bargaining & Behavioural Labour Economics, Public Goods & Enforcement of Cooperation,

- II. Economics experiments building blocks**
- III. Experimental Design**, Designing an Experiment & Experimental Workshop
- IV. Identification of Behavior from Experimental Data**
- V. Market design**, Behavioural Game Theory, Individual Decision Making & Anomalies, Asset Markets and Price Bubbles
- VI. Experiments in the field**, Private Value Auctions, Common Value and Multi-Unit Auctions
- VII. Non-expected utility and discounting**

Recommended Books

- Friedman, D. and S. Sunder, (1994): *Experimental Methods: A Primer for Economists*, Cambridge University Press, Cambridge,
- Kagel, J. and A. Roth (1995): *The Handbook of Experimental Economics*, Princeton University Press, Princeton.
- Davis, D. and C. Holt (1993): *Experimental Economics*, Princeton University Press, Princeton, NJ;
- Smith, V. (2000): *Bargaining and Market Behavior*, Cambridge University Press, Cambridge;
- Smith, V. (1991): *Papers in Experimental Economics*, Cambridge University Press, Cambridge
- Camerer (2000) *Behavioral Game Theory*, Princeton University Press.

ECON 028 Urban Economics

3 Cr. Hrs.

Course Contents

1. Theory of Residential Land Use The Standard Monocentric City Model: Comparative Statics, Dynamic Stability:
2. Durable Housing - Development Timing
3. Durable Housing - Endogenous Maintenance, A Commodity Hierarchy Model, Maintenance, Comparative Statics with Durable Housing:
4. Name Durable Housing - Investment and Demolition
5. Spatial Interactions and Non-monocentric Cities
6. Name Economics of Agglomeration
7. City Sizes: Factory Towns, A System of Cities,

8. Empirical Studies on the Housing Market: Homogeneous Housing, Intraurban Migration, Supply, Demand, Tenure Choice,
9. Urban Transportation: Congestion Pricing and Investment, Second-Best Pricing and Investment, Land Use for Transportation, Transportation Technology and Demand, Regulation of Urban Transportation Services
10. Local Public Goods
11. Taxation: Property Taxes, Capital Gains Tax
12. Externalities and Zoning: Externality Zoning, Fiscal Zoning
13. The Hedonic Approach
14. Measuring the Benefits and Costs of Urban Externalities
15. The Contract Theory and the Housing Market, Tenure Choice Project Financing in Pakistan.

Recommended Books

- Beckmann, M.J., Location Theory, Random House, (1968). (An old book, but still the best one in location theory.)
- Fujita, M., Urban Economics Theory, Cambridge University Press, (1989), (An up-to-date survey of technical aspects of urban land use theory.)
- Henderson, J.V., Economic Theory and the Cities, (2nd Edition), Academic Press, (1985). (A standard graduate textbook.)
- Kanemoto, Y., Theories of Urban Externalities, North-Holland, (1980).
- Miles, D., Housing, Financial Markets and the Wider Economy, Wiley, (1994). (A book on housing economics with special emphasis on the financial side.)
- Mills, E. S. and B.W. Hamilton, Urban Economics, (4th Edition), Scott, Foresman and Company, (1989). (A standard undergraduate textbook. If you have not read this book yet, you should do so in a hurry.)
- Small, K. A., Urban Transportation Economics, Harwood, (1992). (A good survey of recent research on transportation economics with special emphasis on the empirical side.)
- Wildasin, D. E., Urban Public Finance, Fundamentals of Pure and Applied Economics 10, Harwood Academic Publishers: Chur, Switzerland, (1986).

ECON 029 Regional Economics**3 Cr. Hrs.****Course Contents**

Different types of Regions, Micro Level (Regional), Political Blocks, Homogeneous and Heterogeneous Blocks. Need for Planning for Local Level Development; Techniques / Methods / Tools. Regional Aims of Planning. Theoretical and Practical Problems of Regional Development Planning. Combining Theory, Techniques and Practices of Development. Linkage between Planning and Implementation at grassroots Level. Aggregate and Regional Planning Techniques / Models. Inter-industry Model. Theories of Inter-regional Economic Growth. Regional Policies and Alternatives. Shadow Pricing and Socio-economic Development. Criteria for Development of Backward Areas.

Impact of Distance on Classical Economic Markets and Theory of Firms. International and Regional Location Analysis of Industries. Spatial and Economic Structure of Regions and Regional Development. Agglomeration Economics and Industrialization Measurement of Regional Economic Activities. Social and Economic Returns to Develop Backward Regions.

Growth Poles. Project Economics and Planning. Centralized and Decentralized Planning and Financing for Development. Rationale for Decentralization and Functioning of Markets. Factor Mobility, Lack of Local Resources and Financing Techniques. Sharing to Finance Local Projects and Benefits. Cost / Benefits Analysis of Socially Uplifting Projects. Social Returns to Local Projects.

International Inter-regional Economic Growth: Convergence-divergence debate. Regional Policies for Development and Regional (Provincial) development in Pakistan; Planning, Implementation and Progress. International Income Differential and Issues.

Recommended Books

- Armstrong, Harvey, (2000), Regional Economics and Policy, Black wall Publishing Company.
- Choi, Rok-Byung, (2003), High Technology Development in Regional Economic Growth, Policy Implications of Dynamic Externalities, Amazon.com.
- Davis H., Craig, (1990), Regional Economics, Impact Analysis and Project Evaluation, Amazon.com.
- Hijkamp (Editor), Handbook of Regional and Urban Economics, North Holland.

- Lee Roger (ed). (1997), Geographics of Economics, John Wiley and Sons.
- Marshall Peter, (1998), Competitiveness, Localized learning and Regional Development: Specialization and Prosperity in Small Open Economies, (Routledge Functions of Political Economy), Amazon.com.
- Mcker David L., (1970), Regional Economics: Theory and Practice, The Free Press, New York.
- Philip McCann, (2001), Urban and Regional Economics, Oxford University Press.
- Richardson Harry, W., (1985), Regional Development Theories in Economic Prospects for the Northeast, (Editors), Harry W. Richardson and Joseph H., Turek, Temple University Press, Philadelphia, USA.
- Simon David, (1990), Third World Regional Development: A Reappraisal, Paul Chapman Educational Publishing.
- Shrivastava D.S. (1985), Advanced Economics of Development and Planning, Allied Publications, New Delhi.
- Thisse, Fujita, M.J., (2002), Economics of Agglomeration: Cities, Industrial Location, and Regional Growth, Cambridge University Press.
- Taylor, Jim, and Armstrong, H.W., (2000), Regional Economics and Policy, Amazon.com.
- Treyz, George, (1993), Regional Economic Modeling: A Systematic Approach to Economic Forecasting and Policy Analysis, Kluwer Academic Publishers.
- Winters L. Alam, Regional Integration and Development, Amazon.com, latest edition.
- Zaidi, Akbar, (1999), Issues in Pakistan Economy, Oxford Univ. Press, Karachi.

ECON 030 Topics in Marketing

3 Cr. Hrs.

Course Contents

Introduction to Marketing

Key Marketing Concepts, Scope of Marketing, Evolution of Marketing, Importance of Marketing, Marketing as an Exchange Process, Marketing as a Demand Management Tool. Marketing Cost and Price Relationship.

Supply Chain / Value Chain Management

Primary and Secondary activities in Supply Chain / Value Chain. Identify and Maximizing linkages within the Various Activities

Strategic Marketing Planning Process

The SMP Process. The BCG Matrix, GE Nine Cell Model and Porter's Generic Strategies Models of SMP.

International Marketing: The Target Markets & Marketing Mix

Identify Target Markets. Forecasting Market Demand, The Target Market Strategies, Key Elements of Marketing Mix, Local Vs. International Marketing, International Marketing Strategy and Planning, Organizational Structure of International Markets, Exporting, Contracting, International Corporations and their Marketing Techniques. The Promotional Program, the Key Components of Promotional Mix.

Product Management

The Consumer and Industrial Products. Product Planning and Development, Product Adoption and Diffusion, Product Life Cycle, Product Positioning and Differentiation, Product Mix Strategies.

Marketing Cost, Finance and Cost Management

Analysis of Cost, Marketing Cost for Products, Reasons for Higher Cost and Methods to Minimize. Abuses and Advantages of Marketing Cost Debate over Legitimacy Solution, Need for Marketing Finance. Kinds of Marketing. Financing. Significance of Prices, Methods of Price Determination. Key Pricing Strategies. Price wars.

Distribution Management and Market Intermediaries

Designing Distribution Networks. Channels Conflict and Channel Power. Physical Distribution. The Wholesale Market, Retail Marketing.

Consumer's and Buyer's Behaviors

Consumer Motive to Marketing, Models of Consumer, Buyer Behaviour, Influences on Buyer's Behaviour, Industrial Buyer Behaviour. Decision making behavior.

Managing Marketing in Various Forms of Competition

Industrial Analysis, Industry and Market Concepts of Competition, Strategies of Leaders, Challengers, Followers and Nichers. Global Marketing, Industrial Marketing, Services Marketing, Agricultural Marketing.

Managing Total Marketing Effort

Key Organizations for Marketing, Market Control, Marketing Audit.

Segmentation and Targeting

Significance, Advantages of Market Segmentation, Segmentation Variables, Segmenting Industrial Markets, Effectives of Segmentation, Market Targeting, Strategic Opinion.

Pricing Strategies and Sales

Theories of Pricing and Value. Supply and Demand Model, Mark-up Pricing, Dumping, Economic Choice, Pricing and Market Orientation, Market Share, Cost based Pricing, Customer based Pricing Methods, Competitor based Pricing war.

Short-run and Long-run Pricing, Predicting Future Conditions Forecasting Sales and difference Pricing Policies, Data Analysis and Sales Forecasting, Survey and Price Analysis, Profit and other Motives for Pricing.

Recommended Books

- "Basic Marketing" 8th Edition by Jerome McCarthy, Prentice Hall.
- "Marketing Management: Strategic Approach with a Global Orientation" 3rd Edition by Boyd H.W., latest edition.
- "Marketing" 4th Edition by Evans Burman, McMillan Publishing Co., latest edition.
- "Principles of Marketing" by R.D. Tousley, Eugene Clark, latest edition.
- "The Fundamentals of Marketing" 11th Edition by Etzel, Walker & Stanton, McGraw Hill (or latest edition).
- "The Marketing Management" Millennium Edition by Philip Kotler, Prentice Hall, latest edition.

ECON 031 Poverty Alleviation

3 Cr. Hrs.

Objectives

This course should be focused on developing countries. This course will study causes of poverty and underdevelopment, poverty measurement issues, and policies to improve wellbeing. This will concentrate on topics such as nutrition and health, education, labor markets, intra-household allocation of resources and policies to alleviate poverty. Empirical evidence from developing economies will be use extensively.

Course Contents

1. Measuring Poverty, w much poverty? Is it getting worse?
Measurement difficulties
2. Determinants of Poverty, Proximate Causes, Underlying Causes
Institutions, Geography
3. Fertility
4. Investments in Human Capital
5. Education and Income Generation
6. Resources and Outcomes
7. Provision of Education

8. Nutrition and Labor Markets, labor Markets
9. Investments in Health, Disease and Investments in Education
- 10 Child Labor
- 11 Poverty Alleviation – Transfers and Safety Nets
- 12 Foreign Aid

Recommended Books

- World Bank World Development Report, 2000. Attacking Poverty. Introduction and Chapter 1, pp 1-29.
- UNDP. 2000. Overcoming Poverty: UNDP Poverty Report 2000. <http://www.undp.org/povertyreport/>
- Krishna, Anirudh. 2004. *World Development* 32(1): 121-136. "Escaping poverty and becoming poor: who gains, who loses, and why?" Martinussen, chapter 21, pp 296-308. Poverty and social development.
- Wade, Robert. 2001. Making the World Development Report 2000: Attacking Poverty. *World Development* 29(8): 1435-1441.
- Chambers, Robert. 1997. *Whose Reality Counts? Putting the First Last*. Chapter 8, pp 162-187, Poor people's realities: local, complex, diverse, dynamic, and unpredictable.
- Bebbington, Anthony. 1999. Capitals and capabilities: a framework for analyzing peasant viability, rural livelihoods and poverty. *World Development* 27(12): 2021-2044. (electronic)
- Chambers, Robert. 1993. *Challenging the Professions: Frontiers for Rural Development*. London: Intermediate Technology Publications. Chapter 4, pp 40-59, Health, agriculture and rural poverty: why seasons matter.
- Moser, Caroline. 1993. *Gender Planning and Development: Theory, Practice and Training*. New York: Routledge, Chapter 4, pp.55-82: Third World policy approaches to women in development.
- Sen, Amartya. Development as Freedom. New York: Knopf.
- Morris, Morris. *Measuring the condition of the world's poor: the physical quality of life index*. New York: Pergamon Press.
- World Bank World Development Report, 1990. *Poverty*. Overview, pp 1-6.
- Moon, Bruce, and William Dixon. Basic needs and growth-welfare tradeoffs. Chapter 10, pp 119-140 in Seligson, Mitchell, and John Passe-Smith. 1993. *Development and Underdevelopment: The Political Economy of Inequality*. Boulder and London: Lynne Rienner. Department for International Development (DFID), United Kingdom. www.livelihoods.org

contains a lot of material on the “livelihoods” perspective on development and poverty alleviation.

- Hanlon, Joseph. 2004. It is possible to just give money to the poor. *Development and Change* 35(2): 375-383.
- Juliet Hunt ; Nalini Kasynathan. 2001. Pathways to empowerment? Reflections on microfinance and transformation in gender relations in South Asia. *Gender and Development* 9(1): 42 – 52
- Institute of Development Studies Bulletin. 2002. The New Famines. (several articles on why people still starve and what to do about it.)
- Eviatar, Daphne. 2004. Spend \$150 billion per year to cure world poverty. New York
- Times Magazine, November 7, 2004. (*About Jeffrey Sachs' crusade to raise foreign aid spending*)
- Deere, Carmen Diana, and Magdalena Leon. 2003. The gender asset gap: land in Latin America. *World Development* 31(6): 925-947.

**COMPULSORY COURSES IN ENGLISH FOR BS
(4 YEAR) IN BASIC & SOCIAL SCIENCES**

English I (Functional English)

Objectives: Enhance language skills and develop critical thinking.

Course Contents

Basics of Grammar
Parts of speech and use of articles
Sentence structure, active and passive voice
Practice in unified sentence
Analysis of phrase, clause and sentence structure
Transitive and intransitive verbs
Punctuation and spelling

Comprehension

Answers to questions on a given text

Discussion

General topics and every-day conversation (topics for discussion to be at the discretion of the teacher keeping in view the level of students)

Listening

To be improved by showing documentaries/films carefully selected by subject teachers

Translation skills

Urdu to English

Paragraph writing

Topics to be chosen at the discretion of the teacher

Presentation skills

Introduction

Note: Extensive reading is required for vocabulary building

Recommended books:

1. **Functional English**
 - a) Grammar

1. Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0 194313492
 2. Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0 194313506
- b) Writing
1. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- c) Reading/Comprehension
1. Reading. Upper Intermediate. Brain Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.
- d) Speaking

English II (Communication Skills)

Objectives: Enable the students to meet their real life communication needs.

Course Contents

Paragraph writing

Practice in writing a good, unified and coherent paragraph

Essay writing

Introduction

CV and job application

Translation skills

Urdu to English

Study skills

Skimming and scanning, intensive and extensive, and speed reading, summary and précis writing and comprehension

Academic skills

Letter/memo writing, minutes of meetings, use of library and internet

Presentation skills

Personality development (emphasis on content, style and pronunciation)

Note: documentaries to be shown for discussion and review

Recommended books:

Communication Skills

- a) Grammar
 - 1. Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- b) Writing
 - 1. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 45-53 (note taking).
 - 2. Writing. Upper-Intermediate by Rob Nolasco. Oxford Supplementary Skills. Fourth Impression 1992. ISBN 0 194354065 (particularly good for writing memos, introduction to presentations, descriptive and argumentative writing).
- c) Reading
 - 1. Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 4534030.
 - 2. Reading and Study Skills by John Langan
 - 3. Study Skills by Richard Yorky.

English III (Technical Writing and Presentation Skills)

Objectives: Enhance language skills and develop critical thinking

Course Contents

Presentation skills

Essay writing

Descriptive, narrative, discursive, argumentative

Academic writing

How to write a proposal for research paper/term paper

How to write a research paper/term paper (emphasis on style, content, language, form, clarity, consistency)

Technical Report writing

Progress report writing

Note: Extensive reading is required for vocabulary building

Recommended books:

Technical Writing and Presentation Skills

- a) Essay Writing and Academic Writing
 1. Writing. Advanced by Ron White. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 435407 3 (particularly suitable for discursive, descriptive, argumentative and report writing).
 2. College Writing Skills by John Langan. Mc=Graw-Hill Higher Education. 2004.
 3. Patterns of College Writing (4th edition) by Laurie G. Kirszner and Stephen R. Mandell. St. Martin's Press.
- b) Presentation Skills
- c) Reading

The Mercury Reader. A Custom Publication. Compiled by norther Illinois University. General Editors: Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharon. (A reader which will give students exposure to the best of twentieth century literature, without taxing the taste of engineering students).

Pakistan Studies (Compulsory)

Introduction/Objectives

- Develop vision of historical perspective, government, politics, contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Outline

1. Historical Perspective

- a. Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah.
- b. Factors leading to Muslim separatism
- c. People and Land
 - i. Indus Civilization
 - ii. Muslim advent
 - iii. Location and geo-physical features.

2. Government and Politics in Pakistan

Political and constitutional phases:

- a. 1947-58
- b. 1958-71
- c. 1971-77
- d. 1977-88
- e. 1988-99
- f. 1999 onward

3. Contemporary Pakistan

- a. Economic institutions and issues
- b. Society and social structure
- c. Ethnicity
- d. Foreign policy of Pakistan and challenges

e. Futuristic outlook of Pakistan

Books Recommended

1. Burki, Shahid Javed. *State & Society in Pakistan*, The Macmillan Press Ltd 1980.
2. Akbar, S. Zaidi. *Issue in Pakistan's Economy*. Karachi: Oxford University Press, 2000.
3. S.M. Burke and Lawrence Ziring. *Pakistan's Foreign policy: An Historical analysis*. Karachi: Oxford University Press, 1993.
4. Mehmood, Safdar. *Pakistan Political Roots & Development*. Lahore, 1994.
5. Wilcox, Wayne. *The Emergence of Banglades.*, Washington: American Enterprise, Institute of Public Policy Research, 1972.
6. Mehmood, Safdar. *Pakistan Kayyun Toota*, Lahore: Idara-e-Saqafat-e-Islamia, Club Road, nd.
7. Amin, Tahir. *Ethno - National Movement in Pakistan*, Islamabad: Institute of Policy Studies, Islamabad.
8. Ziring, Lawrence. *Enigma of Political Development*. Kent England: WmDawson & sons Ltd, 1980.
9. Zahid, Ansar. *History & Culture of Sindh*. Karachi: Royal Book Company, 1980.
10. Afzal, M. Rafique. *Political Parties in Pakistan*, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research, 1998.
11. Sayeed, Khalid Bin. *The Political System of Pakistan*. Boston: Houghton Mifflin, 1967.
12. Aziz, K.K. *Party, Politics in Pakistan*, Islamabad: National Commission on Historical and Cultural Research, 1976.
13. Muhammad Waseem, *Pakistan Under Martial Law*, Lahore: Vanguard, 1987.
14. Haq, Noor ul. *Making of Pakistan: The Military Perspective*. Islamabad: National Commission on Historical and Cultural Research, 1993.

ISLAMIC STUDIES (Compulsory)

Objectives:

This course is aimed at:

- 1 To provide Basic information about Islamic Studies
- 2 To enhance understanding of the students regarding Islamic Civilization
- 3 To improve Students skill to perform prayers and other worships
- 4 To enhance the skill of the students for understanding of issues related to faith and religious life.

Detail of Courses

Introduction to Quranic Studies

- 1) Basic Concepts of Quran
- 2) History of Quran
- 3) Uloom-ul -Quran

Study of Selected Text of Holly Quran

- 1) Verses of Surah Al-Baqra Related to Faith (Verse No-284-286)
- 2) Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)
- 3) Verses of Surah Al-Mumanoon Related to Characteristics of faithful (Verse No-1-11)
- 4) Verses of Surah al-Furqan Related to Social Ethics (Verse No.63-77)
- 5) Verses of Surah Al-Inam Related to Ihkam (Verse No-152-154)

Study of Selected Text of Holly Quran

- 1) Verses of Surah Al-Ihzab Related to Adab al-Nabi (Verse No.6,21,40,56,57,58.)
- 2) Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
- 3) Verses of Surah Al-Saf Related to Tafakar, Tadabar (Verse No-1,14)

Seerat of Holy Prophet (S.A.W) I

- 1) Life of Muhammad Bin Abdullah (Before Prophet Hood)
- 2) Life of Holy Prophet (S.A.W) in Makkah

- 3) Important Lessons Derived from the life of Holy Prophet in Makkah

Seerat of Holy Prophet (S.A.W) II

- 1) Life of Holy Prophet (S.A.W) in Madina
- 2) Important Events of Life Holy Prophet in Madina
- 3) Important Lessons Derived from the life of Holy Prophet in Madina

Introduction To Sunnah

- 1) Basic Concepts of Hadith
- 2) History of Hadith
- 3) Kinds of Hadith
- 4) Uloom –ul-Hadith
- 5) Sunnah & Hadith
- 6) Legal Position of Sunnah

Selected Study from Text of Hadith

Introduction To Islamic Law & Jurisprudence

- 1) Basic Concepts of Islamic Law & Jurisprudence
- 2) History & Importance of Islamic Law & Jurisprudence
- 3) Sources of Islamic Law & Jurisprudence
- 4) Nature of Differences in Islamic Law
- 5) Islam and Sectarianism

Islamic Culture & Civilization

- 1) Basic Concepts of Islamic Culture & Civilization
- 2) Historical Development of Islamic Culture & Civilization
- 3) Characteristics of Islamic Culture & Civilization
- 4) Islamic Culture & Civilization and Contemporary Issues

Islam & Science

- 1) Basic Concepts of Islam & Science
- 2) Contributions of Muslims in the Development of Science
- 3) Quranic & Science

Islamic Economic System

- 1) Basic Concepts of Islamic Economic System
- 2) Means of Distribution of wealth in Islamic Economics
- 3) Islamic Concept of Riba
- 4) Islamic Ways of Trade & Commerce

Political System of Islam

- 1) Basic Concepts of Islamic Political System
- 2) Islamic Concept of Sovereignty

- 3) Basic Institutions of Govt. in Islam

Islamic History

- 1) Period of Khlaft-E-Rashida
- 2) Period of Ummayyads
- 3) Period of Abbasids

Social System of Islam

- 1) Basic Concepts Of Social System Of Islam
- 2) Elements Of Family
- 3) Ethical Values Of Islam

Reference Books:

- 1) Hameed ullah Muhammad, "Emergence of Islam", IRI, Islamabad
- 2) Hameed ullah Muhammad, "Muslim Conduct of State"
- 3) Hameed ullah Muhammad, "Introduction to Islam"
- 4) Mulana Muhammad Yousaf Islahi,"
- 5) Hussain Hamid Hassan, "An Introduction to the Study of Islamic Law" leaf Publication Islamabad, Pakistan.
- 6) Ahmad Hasan, "Principles of Islamic Jurisprudence" Islamic ResearchInstitute, International Islamic University, Islamabad (1993)
- 7) Mir Waliullah, "Muslim Jrisprudence and the Quranic Law of Crimes" Islamic Book Service (1982)
- 8) H.S. Bhatia, "Studies in Islamic Law, Religion and Society" Deep & Deep Publications New Delhi (1989)
- 9) Dr. Muhammad Zia-ul-Haq, "Introduction to Al Sharia Al Islamia" Allama Iqbal Open University, Islamabad (2001)

Annexure “D”

Note: One course will be selected from the following six courses of Mathematics.

COMPULSORY MATHEMATICS COURSES FOR BS (4 YEAR)

(FOR STUDENTS NOT MAJORING IN
MATHEMATICS)

1. MATHEMATICS I (ALGEBRA)

Prerequisite(s): Mathematics at secondary level

Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of algebra to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Preliminaries: Real-number system, complex numbers, introduction to sets, set operations, functions, types of functions.
Matrices: Introduction to matrices, types, matrix inverse, determinants, system of linear equations, Cramer's rule.

Quadratic Equations: Solution of quadratic equations, qualitative analysis of roots of a quadratic equations, equations reducible to quadratic equations, cube roots of unity, relation between roots and coefficients of quadratic equations.

Sequences and Series: Arithmetic progression, geometric progression, harmonic progression.

Binomial Theorem: Introduction to mathematical induction, binomial theorem with rational and irrational indices.

Trigonometry: Fundamentals of trigonometry, trigonometric identities.

Recommended Books:

Dolciani MP, Wooton W, Beckenback EF, Sharron S, *Algebra 2 and Trigonometry*, 1978, Houghton & Mifflin,

Boston (suggested text)

Kaufmann JE, College *Algebra and Trigonometry*, 1987, PWS-Kent Company, Boston

Swokowski EW, *Fundamentals of Algebra and Trigonometry* (6th edition), 1986, PWS-Kent Company, Boston

2. MATHEMATICS II (CALCULUS)

Prerequisite(s): Mathematics I (Algebra)

Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of calculus to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Preliminaries: Real-number line, functions and their graphs, solution of equations involving absolute values, inequalities.
Limits and Continuity: Limit of a function, left-hand and right-hand limits, continuity, continuous functions.

Derivatives and their Applications: Differentiable functions, differentiation of polynomial, rational and transcendental functions, derivatives.

Integration and Definite Integrals: Techniques of evaluating indefinite integrals, integration by substitution, integration by parts, change of variables in indefinite integrals.

Recommended Books:

Anton H, Bevens I, Davis S, *Calculus: A New Horizon* (8th edition), 2005, John Wiley, New York

Stewart J, *Calculus* (3rd edition), 1995, Brooks/Cole (suggested text)

Swokowski EW, *Calculus and Analytic Geometry*, 1983, PWS-Kent Company, Boston

Thomas GB, Finney AR, *Calculus* (11th edition), 2005, Addison-Wesley, Reading, Ma, USA

3. MATHEMATICS III (GEOMETRY)

Prerequisite(s): Mathematics II (Calculus)

Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of geometry to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Geometry in Two Dimensions: Cartesian-coördinate mesh, slope of a line, equation of a line, parallel and perpendicular lines, various forms of equation of a line, intersection of two lines, angle between two lines, distance between two points, distance between a point and a line.

Circle: Equation of a circle, circles determined by various conditions, intersection of lines and circles, locus of a point in various conditions.
Conic Sections: Parabola, ellipse, hyperbola, the general-second-degree equation

Recommended Books:

Abraham S, Analytic Geometry, Scott, Freshman and Company, 1969
 Kaufmann JE, College *Algebra and Trigonometry*, 1987, PWS-Kent Company, Boston
 Swokowski EW, *Fundamentals of Algebra and Trigonometry* (6th edition), 1986, PWS-Kent Company, Boston

4. COURSE FOR NON-MATHEMATICS MAJORS IN SOCIAL SCIENCES

<i>Title of subject:</i>	MATHEMATICS
<i>Discipline:</i>	BS (Social Sciences).
<i>Pre-requisites:</i>	SSC (Metric) level Mathematics
<i>Credit Hours:</i>	03 + 00
<i>Minimum Contact Hours:</i>	40
<i>Assessment:</i>	written examination;
<i>Effective:</i>	2008 and onward

Aims : To give the basic knowledge of Mathematics and prepare the students not majoring in mathematics.

Objectives : After completion of this course the student should be able to:

- Understand the use of the essential tools of basic mathematics;
- Apply the concepts and the techniques in their respective disciplines;
- Model the effects non-isothermal problems through different domains;

Contents :

1. *Algebra* : *Preliminaries*: Real and complex numbers, Introduction to sets, set operations, functions, types of functions. *Matrices*: Introduction to matrices, types of matrices, inverse of matrices, determinants, system of linear equations, Cramer's rule. *Quadratic equations*: Solution of quadratic equations, nature of

roots of quadratic equations, equations reducible to quadratic equations. *Sequence and Series*: Arithmetic, geometric and harmonic progressions. *Permutation and combinations*: Introduction to permutation and combinations, *Binomial Theorem*: Introduction to binomial theorem. *Trigonometry*: Fundamentals of trigonometry, trigonometric identities. *Graphs*: Graph of straight line, circle and trigonometric functions.

2. *Statistics* : *Introduction*: Meaning and definition of statistics, relationship of statistics with social science, characteristics of statistics, limitations of statistics and main division of statistics. *Frequency distribution*: Organisation of data, array, ungrouped and grouped data, types of frequency series, individual, discrete and continuous series, tally sheet method, graphic presentation of the frequency distribution, bar frequency diagram histogram, frequency polygon, cumulative frequency curve. *Measures of central tendency*: Mean median and modes, quartiles, deciles and percentiles. *Measures of dispersion*: Range, inter quartile deviation mean deviation, standard deviation, variance, moments, skewness and kurtosis.

Books Recommended:

1. Swokowski. E. W., '*Fundamentals of Algebra and Trigonometry*', Latest Edition.
2. Kaufmann. J. E., '*College Algebra and Trigonometry*', PWS-Kent Company, Boston, Latest Edition.
3. Walpole, R. E., '*Introduction of Statistics*', Prentice Hall, Latest Edition.
4. Wilcox, R. R., '*Statistics for The Social Sciences*',
5. Mathematics For Chemistry

Credit Hours: 3

Prerequisites: Mathematics at Secondary level

Specific Objectives of Course: To prepare the students not majoring in mathematics with the essential tools of Calculus to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Preliminaries: Real Numbers and the Real Line, *Functions and their graphs:* Polynomial Functions, Rational Functions, Trigonometric Functions, and Transcendental Functions. Slope of a Line, Equation of a Line, Solution of equations involving absolute values, Inequalities. *Limits and Continuity:* Limit of a Function, Left Hand and Right Hand Limits, Continuity, Continuous Functions. *Derivatives and its Applications:* Differentiation of Polynomial, Rational and Transcendental Functions, Extreme Values of Functions. *Integration and Indefinite Integrals:* Integration by Substitution, Integration by Parts, Change of Variables in Indefinite Integrals. Least-Squares Line.

Recommended Books:

1. Thomas, Calculus, 11th Edition. Addison Wesley publishing company, 2005.
 2. H. Anton, I. Bevens, S. Davis, Calculus, 8th edition, Jhon Willey & Sons, Inc. 2005.
 3. Hughes-Hallett, Gleason, McCallum, et al, Calculus Single and Multivariable, 3rd Edition. John Wiley & Sons, Inc. 2002.
 4. Frank A.Jr, Elliott Mendelson, Calculus, Schaum's Outline Series, 4th edition, 1999.
 5. E. W. Swokowski, Calculus and Analytic Geometry PWS Publishers, Boston, 1983.
 6. John H. Mathews, Numerical Methods for Mathematics Science and Engineering, Prentice-Hall, Second Edition 1992.
6. MATHEMATICS FOR PHYSICS

Contents

1. Preliminary calculus.
 - Differentiation
Differentiation from first principles; products; the chain rule; quotients; implicit differentiation; logarithmic differentiation; Leibnitz' theorem; special points of a function; theorems of differentiation.
 - Integration
Integration from first principles; the inverse of differentiation; integration by inspection; sinusoidal function; logarithmic integration; integration using partial fractions; substitution method; integration by parts; reduction formulae; infinite and

improper integrals; plane polar coordinates; integral inequalities; applications of integration.

2. Complex numbers and hyperbolic functions

- The need for complex numbers
- Manipulation of complex numbers
Additions and subtraction; modulus and argument; multiplication; complex conjugate; division
- Polar representation of complex numbers
Multiplication and division in polar form
- de Moivre's theorem
Trigonometrical identities; finding the n th roots of unity; solving polynomial equations
- Complex logarithms and complex powers
- Applications to differentiation and integration
- Hyperbolic functions
Definitions; hyperbolic-trigonometric analogies; identities of hyperbolic functions; solving hyperbolic equations; inverses of hyperbolic functions; calculus of hyperbolic functions

3. Series and limits

- Series
- Summation of series
Arithmetic series; geometric series; arithmetico-geometric series; the difference method; series involving natural numbers; transformation of series
- Convergence of infinite series
Absolute and conditional convergence; convergence of a series containing only real positive terms; alternating series test
- Operations with series
- Power series
Convergence of power series; operations with power series
- Taylor series
Taylor's theorem; approximation errors in Taylor series; standard Maclaurin series
- Evaluation of limits

4. Partial differentiation

- Definition of the partial derivative

- The total differential and total derivative
- Exact and inexact differentials
- Useful theorems of partial differentiation
- The chain rule
- Change of variables
- Taylor's theorem for many-variable functions
- Stationary values of many-variable functions
- Stationary values under constraints

5. Multiple integrals

- Double integrals
- Triple integrals
- Applications of multiple integrals
Areas and volumes; masses, centers of mass and centroids; Pappus' theorems; moments of inertia; mean values of functions
- Change of variables in multiple integrals
Change of variables in double integrals;

6. Vector algebra

- Scalars and vectors
- Addition and subtraction of vectors
- Multiplication by a scalar
- Basis vectors and components
- Magnitude of a vectors
- Multiplication of vectors
Scalar product; vector product; scalar triple product; vector triple product
- Equations of lines and planes
Equation of a line; equation of a plane
- Using vectors to find distances
Point to line; point to plane; line to line; line to plane
- Reciprocal vectors

7. Matrices and vector spaces

- Vectors spaces
Basic vectors; the inner product; some useful inequalities
- Matrices
- The complex and Hermitian conjugates of a matrix
- The determinant of a matrix
Properties of determinants
- The inverse of a matrix
- The rank of a matrix
- Simultaneous linear equations

- N simultaneous linear equations in N unknowns
- Special square matrices
Diagonal; symmetric and antisymmetric; orthogonal; Hermitian; unitary normal
- Eigen vectors and eigen values of a normal matrix; of Hermitian and anti-Hermitian matrices; of a unitary matrix; of a general square matrix
- Determination of eigen values and eigen vectors degenerate eigen values

8. Vector calculus

- Differentiation of vectors
Composite vector expressions; differential of a vector
- Integration of vectors
- Space curves
- Vector functions of several arguments
- Surfaces
- Scalar and vector fields
- Vector operators
Gradient of a scalar field; divergence of a vector field; curl of a vector field
- Vector operator formulae
Vector operators acting on sums and products; combinations of grad, div and curl
- Cylindrical and spherical polar coordinates Cylindrical polar coordinates; spherical polar coordinates

INTRODUCTION TO STATISTICS

Credit hrs: 3(3-0)

- Unit 1. What is Statistics?
Definition of Statistics, Population, sample Descriptive and inferential Statistics, Observations, Data, Discrete and continuous variables, Errors of measurement, Significant digits, Rounding of a Number, Collection of primary and secondary data, Sources, Editing of Data. Exercises.
- Unit 2. Presentation of Data
Introduction, basic principles of classification and Tabulation, Constructing of a frequency distribution, Relative and Cumulative frequency distribution, Diagrams, Graphs and their Construction, Bar charts, Pie chart, Histogram, Frequency polygon and Frequency curve, Cumulative Frequency Polygon or Ogive, Histogram, Ogive for Discrete Variable. Types of frequency curves. Exercises.
- Unit 3. Measures of Central Tendency
Introduction, Different types of Averages, Quantiles, The Mode, Empirical Relation between Mean, Median and mode, Relative Merits and Demerits of various Averages. properties of Good Average, Box and Whisker Plot, Stem and Leaf Display, definition of outliers and their detection. Exercises.
- Unit 4. Measures of Dispersion
Introduction, Absolute and relative measures, Range, The semi-Inter-quartile Range, The Mean Deviation, The Variance and standard deviation, Change of origin and scale, Interpretation of the standard Deviation, Coefficient of variation, Properties of variance and standard Deviation, Standardized variables, Moments and Moments ratios. Exercises.
- Unit 5. Probability and Probability Distributions.
Discrete and continuous distributions: Binomial, Poisson and Normal Distribution. Exercises
- Unit 6. Sampling and Sampling Distributions
Introduction, sample design and sampling frame, bias, sampling and non sampling errors, sampling with and without replacement, probability and non-probability sampling, Sampling distributions for single mean and proportion, Difference of means and proportions. Exercises.

- Unit 7. Hypothesis Testing
Introduction, Statistical problem, null and alternative hypothesis, Type-I and Type-II errors, level of significance, Test statistics, acceptance and rejection regions, general procedure for testing of hypothesis. Exercises.
- Unit 8. Testing of Hypothesis- Single Population
Introduction, Testing of hypothesis and confidence interval about the population mean and proportion for small and large samples, Exercises
- Unit 9. Testing of Hypotheses-Two or more Populations
Introduction, Testing of hypothesis and confidence intervals about the difference of population means and proportions for small and large samples, Analysis of Variance and ANOVA Table. Exercises
- Unit 10. Testing of Hypothesis-Independence of Attributes
Introduction, Contingency Tables, Testing of hypothesis about the Independence of attributes. Exercises.
- Unit 11. Regression and Correlation
Introduction, cause and effect relationships, examples, simple linear regression, estimation of parameters and their interpretation. r and R^2 . Correlation. Coefficient of linear correlation, its estimation and interpretation. Multiple regression and interpretation of its parameters. Examples

Recommended Books

- 1 Walpole, R. E. 1982. "Introduction to Statistics", 3rd Ed., Macmillan Publishing Co., Inc. New York.
- 2 Muhammad, F. 2005. "Statistical Methods and Data Analysis", Kitab Markaz, Bhawana Bazar Faisalabad.

Note: General Courses from other Departments

Details of courses may be developed by the concerned universities according to their Selection of Courses as recommended by their Board of Studies.