CURRICULUM
OF
ECONOMICS
BS (4-YEAR)

2008

HIGHER EDUCATION COMMISSION
ISLAMABAD
CURRICULUM DIVISION, HEC

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Prof. Dr. Riaz ul Haq Tariq    Member (Acad)
Miss Ghayyur Fatima    Deputy Director (Curri)
Mr. M. Tahir Ali Shah    Assistant Director
Mr. Shafiullah Khan    Assistant Director
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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

STAGE-I

STAGE-II

STAGE-III

STAGE-IV

CURRICULUM UNDER CONSIDERATION

COLLECTION OF EXP NOMINATION UNI, R&D, INDUSTRY & COUNCILS

APPRAISAL OF 1ST DRAFT BY EXP

PREPARATION OF FINAL CURRICULUM

QUESTIONNAIRE

CONS. OF NCRC

FINALIZATION OF DRAFT BY NCRC

PRINTING OF CURRICULUM

COMMENTS

PREPARATION OF DRAFT BY NCRC

IMPLEMENTATION OF CURRICULUM

ORIENTATION COURSES BY LI, HEC

BACK TO STAGE-I

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, Convener
   Department of Economics,
   Bahauddin Zakariya University, Multan

2. Prof. Dr. Zakir Hussain, Member
   Chairman,
   Department of Economics,
   University of Sargodha, Sargodha,
   Member

3. Prof. Dr. Sofia Anwar, Member
   Assistant Professor,
   Department of Economics,
   University of Sargodha, Sargodha

4. Prof. Dr. Eatzaz Ahmad, Member
   Department of Economics,
   Quaid-i-Azam University, Islamabad.

5. Dr. Pervez Zamurad Janjua, Member
   HEC, Foreign Faculty Expert,
   IIIE, International Islamic University,
   Islamabad

6. Dr. Hafiz M. Yasin, Member
   Chairman, School of Economics, IIIE
   International Islamic University, Islamabad

7. Dr. Rashid Naeem, Member
   Chairman,
   Department of Economics,
   Allama Iqbal Open University, Islamabad

8. Prof. Dr. Marhab Qasmi, Member
   Department of Economics,
   University of Sindh,
   Jamshoro
The preliminary meeting started with the recitation from the Holy Quran by Mr. Shafullah, 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)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
<th>Subject</th>
<th>Cr. hr</th>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>English I</td>
<td>3</td>
<td>1. Sociology</td>
<td>3</td>
<td>1. Principal of Micro Econ.</td>
<td>3</td>
</tr>
<tr>
<td>English II</td>
<td>3</td>
<td>2. Education</td>
<td>3</td>
<td>2. Principal of Macro Econ.</td>
<td>3</td>
</tr>
<tr>
<td>English III</td>
<td>3</td>
<td>3. Psychology</td>
<td>3</td>
<td>3. Intermediate Micro Eco.</td>
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<tr>
<td>Pakistan studies</td>
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<td>5. Geography</td>
<td>3</td>
<td>Macro Economics</td>
<td>3</td>
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<tr>
<td>Islamic Studies/ Ethics</td>
<td>2</td>
<td>6. Philosophy</td>
<td>3</td>
<td>Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics I</td>
<td>3</td>
<td>7. General Science</td>
<td>3</td>
<td>Statistics II</td>
<td>3</td>
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<tr>
<td>Mathematics II/Univ.</td>
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<td></td>
<td>Deve. Economics</td>
<td>3</td>
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<tr>
<td>Introduction to Computer</td>
<td>3</td>
<td></td>
<td></td>
<td>Research Methodology</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses: 9 25 Courses: 8 24 Courses: 9 27

**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**

### General Courses to be chosen from other departments

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<tr>
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<td>Education</td>
<td>3</td>
<td>Intermediate Micro Eco.</td>
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<tr>
<td>Psychology</td>
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<td>World History</td>
<td>3</td>
<td>Intermediate</td>
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<td>Philosophy</td>
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<tr>
<td>Agriculture Economics</td>
<td>3</td>
<td></td>
<td></td>
<td>9. Agriculture Economics</td>
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</table>

Courses: 12 36 Courses: 6 18

### Discipline Specific Foundation Courses

<table>
<thead>
<tr>
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<td>Subject</td>
<td>Cr. hr</td>
<td>Subject</td>
<td>Cr. hr</td>
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<tr>
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<tr>
<td>Macro Economics</td>
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<td>Elective-II</td>
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<td>3</td>
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<tr>
<td>Econometrics I</td>
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<td>Elective-III</td>
<td>3</td>
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<tr>
<td>Econometrics II</td>
<td>3</td>
<td>Elective-IV</td>
<td>3</td>
<td>4. Elective-IV</td>
<td>3</td>
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<tr>
<td>International Trade Theory</td>
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<td>Elective-V</td>
<td>3</td>
<td>5. Elective-V</td>
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<tr>
<td>Public Finance</td>
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<td>Elective-VI</td>
<td>3</td>
<td>6. Elective-VI</td>
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<tr>
<td>Mathematical Economics I</td>
<td>3</td>
<td></td>
<td></td>
<td>(List of Elective/Optional subject is given)</td>
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<tr>
<td>Mathematical Economics II</td>
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<td></td>
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<tr>
<td>Islamic Economics</td>
<td>3</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Applied Economics</td>
<td>3</td>
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<tr>
<td>Research Paper</td>
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<td></td>
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</table>

Courses: 12 36 Courses: 6 18

### Major courses including research project/internship

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<td>2. Elective-II</td>
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<td>6. Public Finance</td>
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<td>(List of Elective/Optional subject is given)</td>
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<td>7. Mathematical Economics I</td>
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<td>10. Islamic Economics</td>
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<td>11. Applied Economics</td>
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<td>12. Research Paper</td>
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Courses: 12 36 Courses: 6 18
# Scheme of Studies for BS (4 Year)

**Economics**

<table>
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<tr>
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<th>Name of Subject</th>
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<td>ECON 103 Islamic Studies</td>
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<td>ECON 104 Mathematics I</td>
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<td>ECON 105 Computer Application</td>
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<td>ECON 106 Optional (Non-Economic)</td>
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<td><strong>Second</strong></td>
<td>ECON 107 English II</td>
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<tr>
<td></td>
<td>ECON 108 Pakistan Studies</td>
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<td></td>
<td>ECON 109 Principal of Macro Economics</td>
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<tr>
<td></td>
<td>ECON 110 Mathematics II</td>
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<tr>
<td></td>
<td>ECON 111 Optional (Non-Economics)</td>
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<td></td>
<td>ECON 112 Optional (Non-Economics)</td>
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<tr>
<td><strong>Third</strong></td>
<td>ECON 201 English III</td>
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<td>ECON 202 Intermediate Micro Economics</td>
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<td>ECON 203 Development Economics</td>
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<td><strong>Fourth</strong></td>
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<td>ECON302</td>
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<td>ECON303</td>
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<td>ECON308</td>
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<td>ECON309</td>
<td>Mathematical Economics II</td>
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<td>ECON310</td>
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<td>ECON311</td>
<td>Optional (Economics)</td>
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<td>ECON401</td>
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<td>ECON 403</td>
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<td>ECON404</td>
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<td>ECON405</td>
<td>Optional (Economics)</td>
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<td>ECON408</td>
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**Sixth**

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</table>

**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**
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
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

Recommended Books


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

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

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

Agriculture and Industry
Agriculture vs. Industry: Development Debate. Lewis’ Model of surplus Labor. Rains’ Fei Model and its critical review. Transforming Agriculture,

**Population, Education and Human Capital**


**International Debt, Aid / Assistance**


**WTO, Liberalization and International Trade**


**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

Economic Growth and Environment

Recommended Books
• Thirlwall, A.P., (2003), Growth and Development, With Special Reference to Developing Economies 7th edition, Palgrave Publisher.
• UNDP, Human Development Reports, Annual Reports.

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

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
- 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.

Role of Agriculture in Economic Development

Theory of Rent and the Concept of ‘Surplus’

Agriculture in Dualistic Development Models

Resource Use Efficiency and Technical Change in Peasant Agriculture.

Supply Response
Population and Food Supplies
Synthesis of Population and Food Supply Theories. Malnutrition in Developing Countries like Pakistan and Remedial Manners.

Recommended Books
• 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.
• 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.

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
• Henderson & Quandt - Microeconomic Theory: A Mathematical Approach-
ECON 302 Econometrics I 3 Cr. Hrs.

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

Recommended Books

- Oxford University Press.

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**

**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**

**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

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

Macroeconomic Policy Debate

**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**
- Prentice Hall
- Scarth, William,M – Macroeconomics: An Introduction to Advanced methods-

**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 ($\beta_1, \beta_2, \ldots, \beta_k$), 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

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
- John Willey and Sons.
- Maddala, G.S. & Kim –Unit Roots, Co-integration and Structural Change -(1998)
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

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

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

Non-Linear Programming

Recommended Books
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

Growth and Trade

Technology and Factor Endowment

Factor Endowment and Heckscher–Ohlin Theory

Markets, Cartels and International Trade

Tariff, Quota, Trade Policies and WTO

Major Contemporary International Economic Issues:
Recommended Books


ECON 402 Research Methodology 3 Cr. Hrs.

Course Contents

Recommended Books

- Kidder Louise H., Research Methods in Social Relations.
- Neuman W. Lawrence, (1997) Social Research Methods, Qualitative and Quantitative Approaches, Allyn and Bacon; Boston.
- Sckaran Business Research Methods
ECON 403 Public Finance 3 Cr. Hrs.

Course Contents
Introduction and Role of Public Sector

The Theory of Public Goods

Public Revenue and Taxes

The Theory of Public Goods

Distributional Equity in Taxation

Tax Structure of Pakistan

Fiscal Policy: Public Expenditure and Budget
Theories of Public Expenditures, Wagner’s Law, Efforts of Public Expenditures. Components of Public Expenditures in Pakistan, Sources

**Fiscal Relations**

**Recommended Books**
- Chellieah R.J. (Latest eds.), Fiscal Policy in Less Developed countries.

**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

Socialism

Keynesian and Post Keynesian School

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.


Recommended Books
• 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.

ECON 406  Applied Economics  3 Cr. Hrs.

Course Contents
Introduction to Windows 2000 and Ms-Word

PowerPoint and MS-Access (XP)
Database Concepts, File Linkages, Data Retrieval, Data Editing / Updating. Data Transferring.

SPSS and E-View

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

Project Appraisal and Computer Application

Econometric Analysis and Computer Applications

Recommended Books
- E-View Manual, (Learning help available with package (software)).
- 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 Economic Thought

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 Slalm, 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

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

- Taqi Usmani, Justice M – (2000) - Introduction to Islamic Finance -
- Idarat-al- Ma’arif 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.
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


Recommended Books

- 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 towards 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
- 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
ECON 003  Labor Economics  3 Cr. Hrs.

Course Contents

Importance of Labor Economics

Labor Markets Analysis: Demand for Labor

Labor Market: Supply of Labor and Wages

Wages, Unemployment and Inflation

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

Labor Market Information System

Theories of Labor Movements
Child Labor

Recommended Books
- Bruce, Kaufman; e. Kaufman, Julie L; Hotchkiss, (2002), Economics of Labour Markets, Thomson Publisher.
- Reynolds, Labor Economics and Labor Relations.

ECON 004 Population Economics 3 Cr. Hrs.

Course Contents

Recommended Books


**ECON 005 Comparative Economic System** 3 Cr. Hrs.

**Course Contents**

**Evaluation of Economic Systems**


**Capitalism**

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

Communism and Socialism

Economic System of Islam

Economic System in Pakistan

Recommended Books
- Capitalism, Socialism and Islam by Syed A. Ala Maududi, Islamic Book Publisher, Lahore.
- Economic System of Islam by M. Omer Chapra.
- Islam or Socialism by Wilicaynaki.
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

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)

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 and Storey D.J., Finance and Small Firms, RoutLedge, London (Latest).

ECON 007 Major Issues in Pakistan Economy 3 Cr. Hrs.

Course Contents
Overview of Pakistan Economy
Poverty, Income Distribution, Debt, Deficit etc. Growth with limited development in Pakistan.

**Development Planning and Resource Mobilization**


**Agriculture and Industrial Development: Emerging Issues**


**Sectoral Development, Employment Pattern and Unemployment**


**International Debt and Dependency**


**Poverty and Income Distribution**


Inflation, Foreign Trade Deficit and Emerging Issues

Recommended Books
- Human Development In South Asia, Annual Report.
- World Development Reports, World Bank.

ECON 008 Environmental Economics 3 Cr. Hrs.

Course Contents
Introduction and Awareness

Analytical Tools: An Environment
Economic Efficiency and Markets. Equity and Social Efficiency. External costs and external benefits.

**The Economics of Environmental Quality**

**Valuing the Environment and Benefit Cost Analysis**

**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**

**The Global Environment**

**Recommended Books**

ECON 009 Operations Research 3 Cr. Hrs.

Course Contents

Introduction

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

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.
Probabilistic Models: A continues 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

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


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

Demand for Money
The Money Supply Process

The Conduct of Monetary Policy: Central Bank

Money & Interest Rates

Money and Inflation

Monetary Policy in International Framework
Recommended Books


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:

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:

Recommended Books
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


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.

Objective

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.**

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 Hecksher-Ohlin Model. The Stolper-Samuelson and the Rybchinskii theorems. The verification of the Hecksher-Ohlin model: the Leontieff's paradox. The influence of international trade on the income distribution and the Hecksher-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**


ECON 016 International Finance 3 Cr. Hrs.

Course Contents
Introduction.
Introduction to international finance, International institutions, Funding Mechanism of International Intuitions, Mechanisms and institutions for financing.

Foreign Exchange Market and Exchange Rate Determination

Purchasing Power Parity, Exchange Rates and Balance of Payments (B.O.P)
Open Economy: Monetary and Fiscal Policy

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

International Institutions and Flow of Capital

ECON 017 Development Policy 3 Cr. Hrs.

Course Contents
International Debt, Aid/Assistance, and New Role of World Bank and IMF
mobilization/Domestic resource mobilization, Debt rescheduling etc. Debt Modeling and Forecasting Future Implication. Solution to debt Problem.

**Resource Mobilization and Industrialization**

**Multinational Corporations (MNC’S), FDI and Development**

**Poverty and Income Distribution**

**Environment and Development**

**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,

**Growth Models**


**Recommended Books**


**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

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.


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


Recommended Books

- Eggertson Thr. Institutions and Economic Behavior.
- Milgrom P., Roberts J. Economics, Organisation and Management.

ECON 019  Financial Institutions and Markets          3 Cr. Hrs.

Course Contents

Theory of the Role and Functioning of Financial System

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 indictors for commercial banks; recent issues in commercial banking.
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

Recommended Books
- History of State Bank of Pakistan (Volume – 3, chapters 2 to7, 13).
- SBP Annual and Quarterly Reports

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
Recommended Books

- Fudenberg, D. and J. Tirole “Game Theory”, MIT Press, 1996, Ch. 4.5

ECON 021 Managerial Economics 3 Cr. Hrs.

Course Contents

Nature, Scope and Overview of Managerial Economics


Demand Analysis: Estimation and Forecasting

The Basis for Demand. The Market Demand function. Demand sensitivity analysis: Elasticity, Price Elasticity of Demand with Managerial

**Production and Cost Analysis**

**Decision Making Under Risk and Uncertainty**

**Pricing Analysis and Decisions**

**Managerial Theories and Models of the Firm**

**Public Sector Production and Pricing of Goods**

**Capital Budgeting and Investment**
Recommended Books


ECON 022 Political Economy 3 Cr. Hrs.

Course Contents

Introduction

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

Regional Dynamics

Political Economy of Economic Development

**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**

**Global Issues**

**Recommended Books**
• Hagen Everett E., The Economics of Development, Richard D. Irwin, Inc. (Latest eds.).
• Hussain Israt, (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.
• 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
**Consumer Surplus and Public Welfare**


**Economic Theory of Bundling**


**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**


**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

Imperfect Competition and Macroeconomics (1 lecture).

Theory of Regulation

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
• Dixit A.K., and J. Stiglitz, 1977, Monopolistic Competition and Optimum Product
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
- 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.
- 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**


**Recommended Books**


**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


**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
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

- Small, K. A., Urban Transportation Economics, Harwood, (1992). (A good survey of recent research on transportation economics with special emphasis on the empirical side.)
ECON 029 Regional Economics  3 Cr. Hrs.

Course Contents


Recommended Books

- Hijkamp (Editor), Handbook of Regional and Urban Economics, North Holland.
• 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.
• Winters L. Alam, Regional Integration and Development, Amazon.com, latest edition.

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

International Marketing: The Target Markets & Marketing Mix

Product Management

Marketing Cost, Finance and Cost Management

Distribution Management and Market Intermediaries

Consumer’s and Buyer’s Behaviors

Managing Marketing in Various Forms of Competition

Managing Total Marketing Effort
Key Organizations for Marketing, Market Control, Marketing Audit.

Segmentation and Targeting
Pricing Strategies and Sales
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

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

**Recommended Books**

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

- Times Magazine, November 7, 2004. (About Jeffrey Sachs’ crusade to raise foreign aid spending)
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 everyday 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
b) Writing

c) Reading/Comprehension

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

b) Writing

c) Reading
   2. Reading and Study Skills by John Langan
   3. Study Skills by Riahard 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

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 Scharton. (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

   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

Annexure “C”

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) Hameedullah Muhammad, “Emergence of Islam”, IRI, Islamabad
2) Hameedullah Muhammad, “Muslim Conduct of State”
3) Hameedullah Muhammad, “Introduction to Islam”
4) Mulana Muhammad Yousaf Islahi, “
6) Ahmad Hasan, “Principles of Islamic Jurisprudence” Islamic Research Institute, International Islamic University, Islamabad (1993)
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:


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

4. COURSE FOR NON-MATHEMATICS MAJORS IN SOCIAL SCIENCES

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

**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**
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 medium and modes, quartiles, deciles and percentiles. **Measures of dispersion:** Range, inter quartile deviation mean deviation, standard deviation, variance, moments, skewness and kurtosis.

**Books Recommended:**

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:


Recommended Books:


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 nth 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

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

Unit 1. What is Statistics?

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, Historigram, 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

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-Independece of Attributes**

Unit 11. **Regression and Correlation**

**Recommended Books**


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**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.