University of Pune

Revised Structure & Syllabi for Three Year Degree Programme of Bachelor of Computer Applications (B.C.A.)

1. The title of the programme will be Bachelor of Computer Application (B.C.A.) under Commerce Faculty.
   The revised program will be introduced for -
   a) F.Y.B.C.A. from the academic year 2008-09
   b) S.Y.B.C.A. from the academic year 2009-10
   c) T.Y.B.C.A. from the academic year 2010-11

2. Objectives: The objectives of the Programme shall be to provide sound academic base from which an advanced career in Computer Application can be developed. Conceptual grounding in computer usage as well as its practical business application will be provided.

3. Eligibility for admission: In order to be eligible for admission to Bachelor of Computer Applications a candidate must have passed
   a. HSC (10+2) from any stream with English as passing Subject with minimum 45% marks in aggregate.
   b. Two years Diploma in Pharmacy Course of Board of Technical Education, conducted by Government of Maharashtra or its equivalent.
   c. Three Year Diploma Course (after S.S.C. i.e. 10th Standard), of Board of Technical Education conducted by Government of Maharashtra or its equivalent.
   d. MCVC
   e. Every eligible candidate has to pass Common Entrance Test to be conducted by the respective Institute/College.

4. Duration: The duration of the B.C.A. Degree Program shall be three years divided into six semesters.

5. The scheme of Examinations:
   The BCA Examination will be of 3600 marks as given Below
   I) a) F.Y.B.C.A. (Sem I + Sem II) : 1200 marks
       b) S.Y.B.C.A. (Sem III + Sem IV) : 1200 marks
       c) T.Y.B.C.A. (Sem V + Sem VI) : 1200 marks
   II) For Theory Paper There Will Be 80:20 Pattern
       80 Marks : University Exam
       20 Marks : Internal Exam
       For Practical And Project Examination
       Sem I to VI : 100 marks
       Sem I, III, V : External Assessment
       Sem II, IV, VI : External Assessment
6. The Standard of Passing and Award of Class
In order to pass in the examination the candidate has to obtain 40 marks out of 100. (Min 32 marks must be obtained in University Examination).

The class will be awarded on the basis of aggregate marks obtained by the candidate for all three years examinations.

The award of class will be as follows:

<table>
<thead>
<tr>
<th>Aggregate Percentage of Marks</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Aggregate 70% and above</td>
<td>First Class with Distinction.</td>
</tr>
<tr>
<td>(ii) Aggregate 60% and above but less than 70%</td>
<td>First Class</td>
</tr>
<tr>
<td>(iii) Aggregate 55% and more but less than 60%</td>
<td>Higher Second Class</td>
</tr>
<tr>
<td>(iv) Aggregate 50% and more but less than 55%.</td>
<td>Second Class.</td>
</tr>
<tr>
<td>(v) Aggregate 40% and more but less than 50%</td>
<td>Pass Class.</td>
</tr>
<tr>
<td>(vi) Below 40%</td>
<td>Fail.</td>
</tr>
</tbody>
</table>

7. RULES OF A.T.K.T.

a) A student shall be allowed to keep term for the Second Year, if he/she has a backlog of not more than three theory & one practical or four theory heads of total number of subjects of the First year examination, which consist of First & Second Semester.
b) A student shall be allowed to keep term for the Third year, if he/she has no backlog of first Year & if he/she has a backlog of not more than three theory & one practical or four theory heads of total number of subject of the Second Year examination which consist of Third & Fourth Semester.

8. The Medium of Instruction and Examination (Written and Viva) shall be English.

9. The Semester wise Structure of the programme shall be as follows:

**Semester – I**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Newly Proposed Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Business Communication</td>
</tr>
<tr>
<td>102</td>
<td>Principles of Management</td>
</tr>
<tr>
<td>103</td>
<td>Programming Principles and Algorithms</td>
</tr>
<tr>
<td>104</td>
<td><strong>Computer Fundamental and Office Automation</strong></td>
</tr>
<tr>
<td>105</td>
<td>Business Accounting</td>
</tr>
<tr>
<td>106</td>
<td>Computer Laboratory and Practical Work (OA+PPA)</td>
</tr>
</tbody>
</table>

**Semester – II**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Newly Proposed Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Organizational Behavior</td>
</tr>
<tr>
<td>202</td>
<td>Elements of Statistics</td>
</tr>
<tr>
<td>203</td>
<td><strong>‘C’ Programming</strong></td>
</tr>
<tr>
<td>204</td>
<td><strong>File Structure and Database Concepts</strong></td>
</tr>
<tr>
<td>205</td>
<td>Cost Accounting</td>
</tr>
<tr>
<td>206</td>
<td>Computer Laboratory and Practical Work (C.P + DBMS)</td>
</tr>
</tbody>
</table>
### Semester – III

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Newly Proposed Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Numerical Methods</td>
</tr>
<tr>
<td>302</td>
<td>Data Structure using C</td>
</tr>
<tr>
<td>303</td>
<td>Software Engineering</td>
</tr>
<tr>
<td>304</td>
<td>Management Accounting</td>
</tr>
<tr>
<td>305</td>
<td>RDBMS</td>
</tr>
<tr>
<td>306</td>
<td>Computer Laboratory and Practical Work (D.S + RDBMS)</td>
</tr>
</tbody>
</table>

### Semester – IV

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Newly Proposed Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>Networking</td>
</tr>
<tr>
<td>402</td>
<td>Visual Basic</td>
</tr>
<tr>
<td>403</td>
<td>Inventory Management (SAD)</td>
</tr>
<tr>
<td>404</td>
<td>Human Resource Management</td>
</tr>
<tr>
<td>405</td>
<td>Object Oriented Programming using C++</td>
</tr>
<tr>
<td>406</td>
<td>Computer Laboratory and Practical Work (VB + C++)</td>
</tr>
</tbody>
</table>

### Semester – V

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Newly Proposed Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>.NET Frameworks</td>
</tr>
<tr>
<td>502</td>
<td>Internet Programming and Cyber Law</td>
</tr>
<tr>
<td>503</td>
<td>Principals of Marketing</td>
</tr>
<tr>
<td>504</td>
<td>Core Java</td>
</tr>
<tr>
<td>505</td>
<td>Project work (VB)</td>
</tr>
<tr>
<td>506</td>
<td>Computer Laboratory and Practical Work (.NET + Core Java)</td>
</tr>
</tbody>
</table>

### Semester – VI

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Newly Proposed Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>601</td>
<td>E-Commerce</td>
</tr>
<tr>
<td>602</td>
<td>Multimedia Systems</td>
</tr>
<tr>
<td>603</td>
<td>Introduction to SysPro And Operating Systems</td>
</tr>
<tr>
<td>604</td>
<td>Advance Java</td>
</tr>
<tr>
<td>605</td>
<td>Project Work (Banking &amp; Finance, Cost Analysis, Financial Analysis, Payroll, EDP, ERP etc.)</td>
</tr>
<tr>
<td>606</td>
<td>Computer Laboratory and Practical Work (Multimedia + Advanced Java)</td>
</tr>
</tbody>
</table>
Syllabus Semester I

Business Communication

Course Code: 101

Objectives:

1) To understand the concept, process and importance of communication.
2) To gain knowledge of media of communication.
3) To develop skills of effective communication - both written and oral.
4) To make students familiar with information technology.

<table>
<thead>
<tr>
<th>Unit 1: Introduction to Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning and Definition - Process - Functions - Objectives - Importance - Essentials of good communication - Communication barriers - Overcoming communication barriers</td>
</tr>
</tbody>
</table>

12

<table>
<thead>
<tr>
<th>Unit 2: Types of Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written - Oral - Face-to-face - Silence - Merits and limitations of each type</td>
</tr>
</tbody>
</table>

12

<table>
<thead>
<tr>
<th>Unit 3: Business Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need and functions of business letters - Planning &amp; layout of business letter - Kinds of business letters - Essentials of effective correspondence</td>
</tr>
</tbody>
</table>

05

<table>
<thead>
<tr>
<th>Unit 4: Drafting of business letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enquiries and replies - Placing and fulfilling orders - Complaints and follow-up - Sales letters - Circular letters - Application for employment and resume</td>
</tr>
</tbody>
</table>

12

<table>
<thead>
<tr>
<th>Unit 5: Oral Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning, nature and scope - Principles of effective oral communication - Techniques of effective speech - Media of oral communication (Face-to-face conversation - Teleconferences - Press Conference - Demonstration - Radio Recording - Dictaphone - Meetings - Rumour - Demonstration and Dramatisation - Public address system - Grapevine - Group Discussion - Oral report - Closed circuit TV). The art of listening - Principles of good listening.</td>
</tr>
</tbody>
</table>

08
Unit 6: Information Technology for Communication

Word Processor - Telex - Facsimile(Fax) - E-mail - Voice mail - Internet – Multimedia - Teleconferencing - Mobile Phone Conversation - Video Conferencing - SMS - Telephone Answering Machine - Advantages and limitations of these types.

Topics Prescribed for workshop/skill lab

i) Group Discussion
ii) Mock Interview
iii) Decision Making in a Group
iv) Written Communication

Recommended Books:

5) Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
7) Communicate to Win - Richard Denny - Kogan Page India Private Limited, New Delhi.
8) Modern Business Correspondence - L. Gartside - The English Language Book Society and Macdonald and Evans Ltd.
10) Creating a Successful CV - Siman Howard - Dorling Kindersley.
Principles of Management

Course Code 102

Objective - To provide a basis of understanding to the students with reference to working of business organization through the process of management.

On completion of the syllabi the student will understand the basic principles of management - will acquaint himself with management process, functions and principles. Student will also get the idea about new developments in management.

1) Nature of Management:
   Meaning, Definition, it's nature purpose, importance & Functions,
   Management as Art, Science & Profession- Management as social System Concepts of management-Administration-Organization

2) Evolution of Management Thought:
   Contribution of F.W.Taylor, Henri Fayol ,Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Various approaches to management (i.e. Schools of management thought) Indian Management Thought

3) Functions of Management: Part-I
   Planning - Meaning - Need & Importance, types levels - advantages & limitations.
   Forecasting - Need & Techniques
   Decision making - Types - Process of rational decision making & techniques of decision making
   Organizing - Elements of organizing & processes:
      Types of organizations, Delegation of authority - Need, difficulties in delegation - Decentralization
   Staffing - Meaning & Importance
   Direction - Nature - Principles
   Communication - Types & Importance
   Motivation - Importance - theories
   Leadership - Meaning - styles, qualities & functions of leaders

4) Functions of Management: Part-II
   Controlling - Need, Nature, importance, Process & Techniques
   Coordination - Need – Importance

5) Strategic Management
   Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India
6) Recent Trends in Management:
   Social Responsibility of Management – environment friendly management
   Management of Change
   Management of Crisis
   Total Quality Management
   Stress Management
   International Management

Books Recommended:-
1. Essential of Management - Horold Koontz and Itienz Weibrich - McGrawhills International
2. Management Theory & Practice - J.N.Chandan
3. Essential of Business Administration - K.Aswathapa
   Himalaya Publishing House
4. Principles & practice of management - Dr. L.M.Parasad, Sultan Chand
   & Sons - New Delhi
5. Business Organization & Management - Dr. Y.K. Bhushan
6. Management: Concept and Strategies By J. S. Chandan, Vikas Publishing
8. Business organization and Management by Talloo by Tata McGraw Hill
   Business Environment and Policy – A book on Strategic Management/Corporate Planning By
   Francis Cherunilam Himalaya Publishing House 2001 Edition
Principles of Programming And Algorithm

Objectives: 1) To Know the Basics Of Programming
2) To Understand how to use programming in day to day Applications.

<table>
<thead>
<tr>
<th>Chapter No.</th>
<th>Name of Content</th>
<th>No. of lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Introduction to ‘C’ Language</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.1 History</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2 Structures of ‘C’ Programming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3 Function as building blocks</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>Language Fundamentals</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2.1 Character set</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2 C Tokens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3 Keywords</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.4 Identifiers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 Variables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.6 Constant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.7 Data Types</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.8 Comments</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>Operators</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3.1 Types of operators</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.2 Precedence and Associativity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3 Expression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.4 Statement and types of statements</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>Built-in Operators and function</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4.1 Console based I/O and related built-in I/O function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.1.1 printf( )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.1.2 scanf( )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.1.3 getch( )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.1.4 getchar( )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.1.5 putchar( )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.2 Concept of header files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.3 Preprocessor directives :</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.3.1 #include</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2 #define

5.0 Control structures

5.1 Decision making structures :
   5.1.1 If
   5.1.2 If-else
   5.1.3 Nested If -else
   5.1.4 Switch.

5.2 Loop Control structures :
   5.2.1 While
   5.2.2 Do-while,
   5.2.3 for, Nested for loop

5.3 Other statements :
   5.3.1 break
   5.3.2 continue
   5.3.3 goto
   5.3.4 exit

6.0 Introduction to problem solving

6.1 Concept : problem solving
6.2 Problem solving techniques (Trial & Error, Brain storming, Divide & Conquer)
6.3 Steps in problem solving (Define Problem, Analyze Problem, Explore Solution)
6.4 Algorithms and Flowcharts (Definitions, Symbols)
6.5 Characteristics of an algorithm
6.6 Conditionals in pseudo-code
6.7 Loops in pseudo code
6.8 Time complexity: Big-Oh notation, efficiency
6.9 Simple Examples: Algorithms and flowcharts (Real Life Examples)

7.0 Simple Arithmetic Problems

7.1 Addition / Multiplication of integers
7.2 Determining if a number is +ve / -ve / even / odd
7.3 Maximum of 2 numbers, 3 numbers
7.4 Sum of first n numbers, given n numbers
7.5 Integer division, Digit reversing, Table generation for n, a^b
7.6 Factorial, sine series, cosine series, nC_r, Pascal Triangle
7.7 Prime number, Factors of a number
7.8 Other problems such as Perfect number, GCD of 2 numbers etc
   1. (Write algorithms and draw flowcharts)
7.9 Swapping

8.0 Functions

8.1 Basic types of function
8.2 Declaration and definition
8.3 Function call
8.4 Types of function
8.5 Parameter passing
   8.5.1 Call by value
   8.5.2 Call by reference

8.6 Scope of variables
8.7 Storage classes
8.8 Recursion.

Total 48

Referential Books:-
1. Let us C-Yashwant Kanetkar.
2. Programming in C- Balguruswamy
3. The C programming Lang., Pearson Ecl – Dennis Ritchie
5. Pointers in C – Yashwant Kanetkar
6. How to solve it by Computer – R. G. Dromy
7. Introduction to algorithms – Cormen, Leiserson, Rivest, Stein
http://www.cs.utexas.edu/users/rpriece
8. Peter Norton’s Introduction to Computers – Tata MGHill
# Computer Fundamental and Office Automation

*Course Code: 104*

Objectives:

1. To know the basics of computers
2. To understand the basics of operating systems
3. To understand how to use software packages in day to day activities

## Sr. No. | Chapter Details | No. of Lect.
--- | --- | ---
1 | **Ch 1: Introduction to Computers** | 12
   1.1 Introduction
   1.2 Characteristics of Computers
   1.3 Block diagram of computer
   1.4 Types of computers and features
      1.4.1 Mini Computers
      1.4.2 Micro Computers
      1.4.3 Mainframe Computers
      1.4.4 Super Computers
   1.5 Types of Programming Languages
      1.5.1 Machine Languages
      1.5.2 Assembly Languages
      1.5.3 High Level Languages
   1.6 Data Organization
      1.6.1 Drives
      1.6.2 Files
      1.6.3 Directories
   1.7 Types of Memory (Primary and Secondary)
      1.7.1 RAM
      1.7.2 ROM
      1.7.3 PROM
      1.7.4 EPROM
      1.7.5 Secondary Storage Devices (FD, CD, HD, Pen drive)
   1.8 I/O Devices
      1.8.1 Scanners
      1.8.2 Digitizers
      1.8.3 Plotters
      1.8.4 LCD
      1.8.5 Plasma Display
   1.9 Number Systems
      1.9.1 Introduction to Binary, Octal, Hexadecimal system
      1.9.2 Conversion
Referential Books:
1. Fundamental of Computers – By V. Rajaraman B.P.B. Publications
2. Fundamental of Computers – By P. K. Sinha
3. Computer Today- By Suresh Basandra
4. Unix Concepts and Application – By Sumitabha Das
5. MS- Office 2000(For Windows) – By Steve Sagman
6. Computer Networks – By Tennenbum Tata MacGrow Hill Publication
# Business Accounting

**Objective:** To impart basic accounting knowledge

<table>
<thead>
<tr>
<th>UNIT NO.</th>
<th>TOPICS</th>
<th>NO. OF LECTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Introduction:</strong> Financial Accounting-definition and Scope, objectives of Financial Accounting, Accounting v/s Book Keeping Terms used in accounting, users of accounting information and limitations of Financial Accounting.</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td><strong>Conceptual Framework:</strong> Accounting Concepts, Principles and Conventions, Accounting Standards-concept, objectives, benefits, brief review of Accounting Standards in India, Accounting Policies, Accounting as a measurement discipline, valuation Principles, accounting estimates</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td><strong>Recording of transactions:</strong> Voucher system; Accounting Process, Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance. Depreciation: Meaning, need &amp; importance of depreciation, methods of charging depreciation. (WDV &amp; SLM)</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td><strong>Preparation of final accounts:</strong> Preparation of Trading and Profit &amp; Loss Account and Balance Sheet of sole proprietary business</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td><strong>Introduction to Company Final Accounts:</strong> Important provisions of Companies Act, 1956 in respect of preparation of Final Accounts. Understanding of final accounts of a Company.</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td><strong>Computerised Accounting:</strong> Computers and Financial application, Accounting Software packages. An overview of computerized accounting system - Salient features and significance, Concept of grouping of accounts, Codification of accounts, Maintaining the hierarchy of ledger, Generating Accounting Reports.</td>
<td>6</td>
</tr>
</tbody>
</table>

**TOTAL** 48
Recommended Books:

1. Fundamentals of Accounting & Financial Analysis: By Anil Chowdhry (Pearson Education)
2. Financial accounting: By Jane Reimers (Pearson Education)
3. Accounting Made Easy: By Rajesh Agarwal & R Srinivasan (Tata McGraw –Hill)
4. Financial Accounting for Management: By Amrish Gupta (Pearson Education)
5. Financial Accounting for Management: By Dr. S. N. Maheshwari (Vikas Publishing House)
Objective:

To enable the students to understand the impact that individual, group & structures have on behavior within the organizations and apply such knowledge towards improving organizational effectiveness.

No. of Lectures

1. Fundamentals of Organizational Behavior (8)
   - Nature, Scope, Definition and Goals of Organizational Behavior
   - Fundamental Concepts of Organizational Behavior
   - Models of Organizational Behavior
   - Emerging aspects of Organizational Behavior: TQM, Managing Cultural Diversity, Managing the Perception Process

2. Attitude Values and Motivation (8)
   - Effects of employee attitudes
   - Personal and Organizational Values
   - Job Satisfaction
   - Nature and Importance of Motivation
   - Achievement Motive
   - Theories of Work Motivation: Maslow's Need Hierarchy Theory, McGregor's Theory ‘X’ and Theory ‘Y’

3. Personality (8)
   - Definition of Personality, Determinants of Personality
   - Theories of Personality – Trait and Type Theories, The Big Five Traits, Myers-Briggs Indicator, Locus of Control, Type A and Type B Assessment of Personality

4. Work Stress (8)
   - Meaning and definition of Stress, Symptoms of Stress
   - Sources of Stress: Individual Level, Group Level, Organizational Level
   - Stressors, Extra Organizational Stressors
   - Effect of Stress – Burnouts
   - Stress Management – Individual Strategies, Organizational Strategies
   - Employee Counseling

5. Group Behavior and Leadership (8)
   - Nature of Group, Types of Groups
   - Nature and Characteristics of team
   - Team Building, Effective Teamwork
Nature of Leadership, Leadership Styles
Traits of Effective Leaders

6. Conflict in Organizations
   - Nature of Conflict, Process of Conflict
   - Levels of Conflict – Intrapersonal, Interpersonal
   - Sources of Conflict
   - Effects of Conflict
   - Conflict Resolution

Books Recommended:


3. Organizational Behavior - By Fred Luthans

4. Organizational Behavior - By Super Robbins

5. Organizational Behavior - Anjali Ghanekar

6. Organizational Behavior Fundamentals, Realities and Challenges
   By Detra Nelson, James Campbell Quick Thomson Publications

7. Organizational Behavior through Indian Philosophy
   By N. M. Mishra, Himalaya Publication House
Elements of Statistics

Course Code: 202

Objectives:
1. To understand the concept of population and sample.
2. To use frequency distribution to make decision.
3. To understand and to calculate various types of averages and variation.
4. To use the concept of probability in business.
5. To understand the concept and importance of statistical quality control.

Marks: 100

No. of Lectures

Unit 1. Population, Sample and Data Condensation:
Definition and scope of statistics, concept of population and sample with illustration, Raw data, attributes and variables, classification, frequency distribution, Cumulative frequency distribution.

Unit 2. Measures of Central Tendency:
Concept of central tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.

Unit 3. Measures of Dispersion:
Concept of dispersion, Absolute and relative measure of dispersion, range, variance, standard deviation, Coefficient of variation.

Unit 4. Permutations and Combinations:
Permutations of ‘n’ dissimilar objects taken ‘r’ at a time (with or without repetitions). \( ^nP_r = \frac{n!}{(n-r)!} \) (without proof). Combinations of ‘r’ objects taken from ‘n’ objects. \( ^nC_r = \frac{n!}{(r!)(n-r)!} \) (without proof). Simple examples, Applications.

Unit 5. Sample space, events and Probability
Experiments and random experiments. Ideas of deterministic and non-deterministic experiments. Definition of - sample space, discrete sample space, events. Types of events, Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event. Simple examples. Classical definition of probability, Addition theorem of probability without
proof ( upto three events are expected ), Definition of Conditional Probability Definition of independence of two events ,simple numerical problems.

Unit 6. Statistical Quality Control :

Introduction, control limits, specification limits, tolerance limits , process and product control. Control charts for X and R. Control charts for number of defective ( np- chart), control charts for number of defects ( c- chart )

Recommended Books :

3) Montgomery D.C. – Statistical Quality Control
   John Wiley and sons.
5) Gupta S.P. – Statistical Methods, Pub – Sultan Chand and sons New Delhi
## ‘C’ Programming

**Course Code**: 203

**Objectives**: 1) To Know the concepts of “C” Programming  
2) To Understand how to use programming in day to day Applications.

### No. of Lectures

<table>
<thead>
<tr>
<th></th>
<th>Arrays</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Arrays</td>
<td>8</td>
</tr>
<tr>
<td>1.1</td>
<td>Definition, declaration and initialization of one dimensional array</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Accessing array elements</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Displaying array elements</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Sorting arrays,</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Arrays and function,</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Two-Dimensional array</td>
<td></td>
</tr>
<tr>
<td>1.6.1</td>
<td>declaration and initialization</td>
<td></td>
</tr>
<tr>
<td>1.6.2</td>
<td>accessing and displaying</td>
<td></td>
</tr>
<tr>
<td>1.6.3</td>
<td>memory representation of array</td>
<td></td>
</tr>
<tr>
<td>1.6.3.1</td>
<td>row major,</td>
<td></td>
</tr>
<tr>
<td>1.6.3.2</td>
<td>Column major.</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>Multidimensional array</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Pointers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>Pointers</td>
<td>7</td>
</tr>
<tr>
<td>2.1</td>
<td>definition and declaration, Initialization</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>indirection operator, address of operator</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>pointer arithmetic</td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>dynamic memory allocation</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>arrays and pointers</td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td>function and pointers</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Strings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>Strings</td>
<td>7</td>
</tr>
<tr>
<td>3.1</td>
<td>Definition, declaration and initialization of strings</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>standard library functions :</td>
<td></td>
</tr>
<tr>
<td>3.2.1</td>
<td>strlen( )</td>
<td></td>
</tr>
<tr>
<td>3.2.2</td>
<td>strcpy( )</td>
<td></td>
</tr>
<tr>
<td>3.2.3</td>
<td>strcat( )</td>
<td></td>
</tr>
<tr>
<td>3.2.4</td>
<td>strcmp( )</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Implementation without using standard library</td>
<td></td>
</tr>
<tr>
<td>Chapter</td>
<td>Topic</td>
<td>References</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| 4.0     | Structures | 1. Let us C-Yashwant Kanetkar.  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
| 4.0     | Functions | 1. Let us C-Yashwant Kanetkar.  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
| 4.1     | Definition and declaration  
| 4.2     | Variables initialization  
| 4.3     | Accessing fields and structure operations  
| 4.4     | Nested structures  
| 4.5     | Union  
|         | 4.5.1. Definition and declaration.  
|         | 4.6. Differentiate between Union and structure |  
| 5.0     | Introduction C Preprocessor |  
| 5.1     | Definition of Preprocessor  
| 5.2     | Macro substitution directives  
| 5.3     | File inclusion directives  
| 5.4     | Conditional compilation. |  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
| 6.1     | Bitwise operators  
| 6.2     | Shift operators  
| 6.3     | Masks  
| 6.4     | Bit field |  
| 7.0     | File handling | 1. Let us C-Yashwant Kanetkar.  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
| 7.1     | Definition of Files, Opening modes of files  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
|         | 7.2.1 fopen( )  
|         | 7.2.2 fclose( )  
|         | 7.2.3 feof( )  
|         | 7.2.4 fseek( )  
|         | 7.2.5 rewind( ) |  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
|         | 7.3.1 fgetc( )  
|         | 7.3.2 putc( )  
|         | 7.3.3 fprintf( )  
| 8.0     | Command line arguments | 1. Let us C-Yashwant Kanetkar.  
|         |          | 2. Programming in C- Balguruswamy  
|         |          | 3. The C programming Lang., Pearson Ecl – Dennis Ritchie  
| Total   | 40 |  |
5. Pointers in C – Yashwant Kanetkar

### File Structure and Database Concepts

**Course Code**: 204

Objectives:
1. To Know the Fundamentals of Databases
2. To Understand how to use Databases in day to day Applications.

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Chapter Details</th>
<th>No. of Lect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>File Structure and Organization</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>1.1 Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2 Logical and Physical Files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2.1 File</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2.2 File Structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2.3 Logical and Physical Files Definitions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3 Basic File Operations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3.1 Opening Files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3.2 Closing Files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3.3 Reading and Writing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3.4 Seeking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.4 File Organization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.4.1 Field and Record structure in file</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.4.2 Record Types</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5 Types of file organization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5.1 Files of Unordered Records (Heap Files)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5.2 File of Ordered Records (Sorted Files)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5.3 Hash Files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.6 Over View of Indexes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.6.1 Dense Index</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.6.2 Sparse Index</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Tree Structured Indexing</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2.1 Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2 Index Sequential Access Method (ISAM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2.1 Structure of index sequential File</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3 B+ Tree : A Dynamic Index Structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3.1 Operations on B+ Tree</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Search</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Insertion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Deletion</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td><strong>Database Management System</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>3.1 Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.2 Definition of DBMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3 file processing system Vs DBMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3.1 Limitation of file processing system</td>
<td></td>
</tr>
</tbody>
</table>
3.3.2 Comparison of File processing system and DBMS

3.4 Advantages and Disadvantages of DBMS

3.5 Users of DBMS
   3.5.1 Database Designers
   3.5.2 Application programmer
   3.5.3 Sophisticated Users
   3.5.4 End Users

3.6 Capabilities of good DBMS

3.7 Overall System structure

4. **Data Models**
   4.1 Introduction
   4.2 Data Models
      4.2.1 Object Based Logical Model
      4.2.2 Record Base Logical Model
         a. Relational Model
         b. Network Model
         c. Hierarchical Model
   4.3 Entity Relationship Model
      4.3.1 Entity Set
      4.3.2 Attribute
      4.3.3 Relationship Set
   4.4 Entity Relationship Diagram (ERD)
   4.5 Extended features of ERD

5. **Relational Databases**
   5.1 Introduction
   5.2 Terms
      a. Relation
      b. Tuple
      c. Attribute
      d. Cardinality
      e. Degree
      f. Domain
   5.2 Keys
      5.2.1 Super Key
      5.2.2 Candidate Key
      5.2.3 Primary Key
      5.2.4 Foreign Key
   5.3 Relational Algebra
      5.3.1 Operations
         a. Select
         b. Project
         c. Union
         d. Difference
         e. Intersection
         f. Cartesian Product
g. Natural Join

6. SQL (Structured Query Language) 10
   6.1 Introduction
   6.2 History Of SQL
   6.3 Basic Structure
   6.4 DDL Commands
   6.5 DML Commands
   6.6 Simple Queries
   6.7 Nested Queries
   6.8 Aggregate Functions
   6.9 Clauses

7. Relational Database Design 5
   7.1 Introduction
   7.2 Anomalies of un normalized database
   7.3 Normalization
   7.4 Normal Form
      7.4.1 1 NF
      7.4.2 2 NF
      7.4.3 3 NF

Total 48

References:
1) Database System Concepts By Henry korth and A. Silberschatz
2) An Introduction to Database System by Bipin Desai
3) File Structure by Michael J. Folk, Greg, Riccardi
4) Teach Yourself SQL in 14 days by Jeff Parkins and Bryan Morgan
5) Introduction to Postgresql Wrox Publication
# Cost Accounting

**Course Code:** 205  
**Course Title:** Cost Accounting

## Objectives

1. To impart the knowledge of basic cost concepts, element of cost & preparation of cost sheet.  
2. To provide basic knowledge of important methods & techniques of costing.

## Level of Knowledge

Basic understanding of the subject.

## Units

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topics</th>
<th>Teaching Hrs</th>
</tr>
</thead>
</table>
| **Unit 1: Introduction.** | 1.1 Concept of cost, costing, cost accounting & cost accountancy  
1.2 Limitations of financial accounting  
1.3 Origin and objectives of cost accounting  
1.4 Advantages and Limitations of Cost Accounting  
1.5 Difference between financial and cost accounting  
1.6 Cost unit & cost centre | 8 |
| **Unit 2: Elements of Cost** | 2.1 Material, Labour and other Expenses  
2.2 Classification of cost & types of costs  
2.3 Preparation of cost sheet | 8 |
| **Unit 3: Methods of Costing (Theory Only)** | 3.1 Job Costing – Meaning, features, advantages and limitation  
3.2 Contract Costing – Basic Concepts  
3.3 Process Costing - Meaning, Features, Normal and Abnormal Loss/Gains  
3.4 Operating Costing – Meaning, Features & Objectives | 14 |

### Techniques of Costing

- **Budget and Budgetary Control** - Definition, meaning and objectives of budgetary control, advantages and disadvantages of budgetary control, types of budget

- **Marginal Costing** - Meaning and various concepts, fixed cost, variable cost, contribution, P/V ratio, break event point, margin

---

**Course Code:** 205  
**Course Title:** Cost Accounting

## Objectives

1. To impart the knowledge of basic cost concepts, element of cost & preparation of cost sheet.  
2. To provide basic knowledge of important methods & techniques of costing.

## Level of Knowledge

Basic understanding of the subject.

## Units

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topics</th>
<th>Teaching Hrs</th>
</tr>
</thead>
</table>
| **Unit 1: Introduction.** | 1.1 Concept of cost, costing, cost accounting & cost accountancy  
1.2 Limitations of financial accounting  
1.3 Origin and objectives of cost accounting  
1.4 Advantages and Limitations of Cost Accounting  
1.5 Difference between financial and cost accounting  
1.6 Cost unit & cost centre | 8 |
| **Unit 2: Elements of Cost** | 2.1 Material, Labour and other Expenses  
2.2 Classification of cost & types of costs  
2.3 Preparation of cost sheet | 8 |
| **Unit 3: Methods of Costing (Theory Only)** | 3.1 Job Costing – Meaning, features, advantages and limitation  
3.2 Contract Costing – Basic Concepts  
3.3 Process Costing - Meaning, Features, Normal and Abnormal Loss/Gains  
3.4 Operating Costing – Meaning, Features & Objectives | 14 |

### Techniques of Costing

- **Budget and Budgetary Control** - Definition, meaning and objectives of budgetary control, advantages and disadvantages of budgetary control, types of budget

- **Marginal Costing** - Meaning and various concepts, fixed cost, variable cost, contribution, P/V ratio, break event point, margin

---
of Safety

Unit 6. **Standard Costing**: Definition and Meaning of Various Concepts
Advantages and Limitations of Standard Costing
Variance Analysis – Material and labour Variances only

| Total Periods | 48 |

**Area of Practical problems:**
Simple Problems on
1) Cost Sheet
2) Techniques of Costing
   I) Marginal Costing
   II) Budget and Budgetary Control – Flexible and Cash Budget
   III) Standard Costing – Material and Labour Variances only

**Allocation of Marks:**
- Theory – 50%
- Practical Problems – 50%

**Compulsory one industrial visit for updating practical knowledge.**

**Books, Journals and Website Recommended: -**

**Books** -
1. Advanced cost Accounting by Saxena and Vasistha.
2. Advanced cost Accounting by S.P.Jain and Narong.
3. Cost Accounting by S.N.Maheshwari
5. Practice in Advanced Costing and Management Accounting by Prof. Subhash Jagtap
   Nirali Prakashan, Pune.
6. Cost and Works Accounting II and III-
   Prof. Subhasg Jagtap,
   Prof.Pagar and Dr.Nare
   K.S.Publication, Pune.
7. Cost Accounting – Bhatta HSM,Himalaya Publication
8. Cost Accounting – Prabhu Dev , Himalaya Publication

**Journals** – **Management Accountant – The ICWA of India, Kolkata**

**CD** on Cost- sheet Prepared by Asian center for Research and Training
Website: