Course Structure of M.Com (Computer Applications) under CBCS

### I Semester

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Paper code</th>
<th>Title</th>
<th>contact Hours</th>
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<th>External</th>
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<tr>
<td>1</td>
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<td>Business Analytics with Spread Sheets</td>
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<td>5</td>
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<td>Organization Theory &amp; Behaviour</td>
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### II Semester

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* Every student admitted in M.Com(Computer Applications) programme under CBCS has to select one course from the Foundation Courses offered by the University in the Second Semester
### Course Structure of M.Com (Computer Applications) under CBCS

#### III Semester

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* Every student admitted in M. Com (Computer Applications) programme under CBCS has to select one course from the Open Elective Courses offered by the University in the Third Semester other than the course offered by the Dept of Commerce & Business Management.

#### IV Semester

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<td>31</td>
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<td>550</td>
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* Every student admitted in M.Com -Computer Applications -under CBCS has to prepare Comprehensive Software Project under the guidance of the Faculty.
MASTER OF COMMERCE (COMPUTER APPLICATIONS): FIRST SEMESTER

101 – BUSINESS ENVIRONMENT

(Common to M.Com, M.Com -Computer Applications,
M Com –Financial Accounting and M Com –Banking & Insurance - under CBCS)

Class Hours : 5 ppw
Credits: 5


Suggested Readings


References


Unit II: Copying text/values/formulas – searching data – sorting – Filtering using filters – Decision making with If condition (logical formulas) – Applying business related formulas – Working with Images –Numerical formatting with Round(), Int(), Ceiling() etc. – Split the view of sheet- Introduction to chart/Graph generation – Pivot Table- Statistical functions – Date & Time functions – Text functions - Financial Functions.


Suggested Readings

References
1. Working with simple statistical functions like SUM, AVERAGE etc
2. Implement a simple cash book with necessary formulas
3. Prepare a marks sheet of six subject marks and write formulae to find the sum, average and grade of each student.
4. Prepare a quotation with different percentages of profits.
5. Prepare a sales report of 10 salespersons of a month
6. Generate a graph of the sales of the 10 salespersons
7. Prepare a sales report of 3 products of 10 salespersons of a month
8. Generate a suitable graph of 3 products of the sales of the 10 salespersons of a month
9. Record the votes polled for a party in 15 constituencies and display in a PIE chart
10. Show the merit order of salespersons in the decreasing order of Sales and Experience
11. Save the sales made by 10 sales persons on 12 different sheets (one sheet per month) in the same order (same cell references).
12. Calculate the sales of each sales person for that year (sum the data of 12 sheets from same cell reference)
13. Indicate the better salespersons with Green color, Average sales persons in Orange color and others in Red color
14. Prepare a balance sheet in the real format (as seen in the book) assume sample data.
15. Store the particulars of some employees and show the list of employees based on the filter criteria.
16. Create an example to demonstrate VLOOKUP functionality
17. Demonstrate the use of Pivot table with a suitable example.
18. Demonstrate the use of any ten Text and Date & Time functions
   Use respective statistical functions and assumed data for the following problems
19. Demonstrate the calculation of Mean-Median, Mode, Harmonic Mean and Geometric Mean
20. Demonstrate Average Deviation, Standard Deviation and Skewness
21. Demonstrate the use of ANOVA with Single factor
22. Demonstrate Correlation and Regression
23. Demonstrate F-Test
24. Demonstrate t-Test and Z-Test
   Use assumed data to implement the following Financial Functions
25. Demonstrate to calculate Asset Depreciation using AMORDEGRC and AMORLINC
26. Demonstrate to calculate Asset Depreciation DB and DDB
27. Demonstrate to calculate Asset Depreciation using SLN, SYD and VDB
28. Demonstrate to calculate Interest Rate functions ACCRINT and ACCRINTM
29. Demonstrate to calculate Interest Rate functions EFFECT and INTRATE
30. Demonstrate to calculate Interest Rate functions NOMINAL and RATE.
Unit-I: Company Accounts – Legal provisions relating to Company Accounts – Profit and Loss Account – Balance Sheet – Valuation of Shares and Goodwill – Methods (simple problems)


Suggested Readings


References


UNIT – II: **Theory of Probability and Probability Distributions:** Probability Meaning and definition of probability – Approaches – Axioms – Additive and Multiplicative theorems – Conditional probability theorem; **Bayes theorem:** Meaning and its application; **Theoretical frequency Distributions:** Classification – Binomial – Poisson – Normal Distributions (Theory and Problems).

UNIT – III: **Sampling and Testing of Hypothesis:** Sampling Meaning – Random and non-random sampling - Merits and demerits; **Hypothesis:** Meaning and steps in testing of hypothesis – Type I and Type II errors – Standard Error – Point and Interval estimates; **Testing of Hypothesis:** Sampling of Attributes – Sampling of Variables – **Parametric Tests** –Large Sample tests: Difference between means and Standard Deviation tests; **Small Samples Tests** – t-distribution and its application

UNIT - IV: **Analysis of Variance:** ANOVA - Meaning – Significance – **Classification of ANOVA:** One-way classification –Two-way classification (Problems).

UNIT – V: **Non-Parametric Tests:** Meaning – Difference between Parametric and Non-parametric tests – **Types of non-parametric tests:** One sample sign test - The Mann Whitney U-test – Kruskal Wallis H-test; **Chi-square test:** Types of Association and Coefficients – Yule’s Coefficient - – Yates Correction – Coefficient of Contingency – Test for Goodness of Fit (Problems)

Suggested Readings


References

### 105- ORGANISATION THEORY AND BEHAVIOUR

(Common to M.Com, M.Com -Computer Applications, M Com –Financial Accounting and M Com –Banking & Insurance - under CBCS)

<table>
<thead>
<tr>
<th>Class Hours</th>
<th>5 ppw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits</td>
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</table>

#### Unit I: Introduction to Organisation and Behaviour:

#### Unit II: Individual Behaviour in Organisations:

#### Unit III: Group Behaviour in Organisations:

#### Unit IV: Behavioural Basis of Organisation Theory:

#### Unit V: Organisational Communication and Leadership

### Suggested Readings

### References

MASTER OF COMMERCE (COMPUTER APPLICATIONS): SECOND SEMESTER

201 – MARKETING MANAGEMENT
(Common to M.Com, M.Com -Computer Applications,
M Com –Financial Accounting and M Com –Banking & Insurance - under CBCS)

Class Hours : 5ppw
Credits: 5


Suggested Readings

References

202 – FINANCIAL MANAGEMENT
(Common to M.Com, M.Com -Computer Applications, M Com –Financial Accounting and M Com –Banking & Insurance - under CBCS)
Class Hours : 5ppw
Credits: 5


UNIT-IV: DIVIDEND DECISION: Dividend Policy and Firm’s Value – Models in which Investment and Dividend Decisions are related- Walter and Gordon’s Models, Traditional Position, Miller and Modigliani Model(Simple Problems) - Financial Signaling; Dividend Decision – Types of Dividend, Stock Dividend, Stock-Splits, Bonus Shares, Share Repurchase and Managerial Considerations in Dividend Policy Formulation.

UNIT-V: WORKING CAPITAL MANAGEMENT: Working Capital Decision – Concept, Characteristics, Components, Operating Cycle, Cash Cycle, Determinants of Working Capital, and Estimation of Working Capital (Simple Problems); Cash and Liquidity Management – Objectives, Cash Budgeting – Cash Collection and Disbursement – Optimum Cash Balance, and Investment of Surplus Funds; Credit Management – Credit terms – Credit Policy Variables, Credit Evaluation and Granting Decision, and Control of
Receivables; **Inventory Management** - Need, Objectives, Order Quantity, Monitoring and Control of Inventories; **Working Capital Financing** – Sources and Financing Strategies.

**Suggested Readings:**

**References:**

***

**203– HUMAN RESOURCE MANAGEMENT**
(Common to M.Com, M.Com -Computer Applications and M Com –Banking & Insurance - under CBCS)

Class Hours: 5ppw
 Credits: 5


Suggested Readings


References


204 - ADVANCED PROGRAMMING WITH C
(for M Com-Computer Application- under CBCS)

Theory – 3 PPW
Lab: 2 PPW
One Period Lab means 2 hours of Lab Session
Credits= 5

Unit I - Introduction to programming Languages – Types of Languages – Steps in program development – Algorithms – Flowcharts – Compilation – Interpretation -History of C language – Structure of C program – Data Types – Variables – Constants – Reserve & Key words - Including Library files.


Unit III - Introduction to Sub programs – Top to bottom approach – Bottom to Top approach - Functions – Global Variables – Local Variables – Passing of Parameters – Calling functions – Call by value & Introduction of the concept of Call by reference – Recursion.

Unit IV- Character Arrays (Strings) - Structures – Unions – Passing structures to functions – Passing Unions to functions – Pointers – Call by Reference using pointers.


Suggested Readings


**References**


***

**LAB-ADVANCED PROGRAMMING WITH C**
(for M Com-Computer Application- under CBCS)

Lab: 2 PPW

One Period Lab means 2 hours of Lab Session

Credits= 2

**Lab** – Students are required to undergo Lab Sessions on the following.

1. Printing output in different formats using the format specifiers.
2. Calculating the denominations for a given amount
3. Accepting the denominations and finding the total amount
4. To calculate the salary of an employee with given percentage of HRA, DA etc.
5. To calculate the telephone/electricity bill by taking the meter readings
6. To calculate the different interest amounts for a given amount.
7. To find the biggest/least/both from a given set of numbers.
8. To print the Fibonacci series
9. To find the sum of digits of a given number
10. To reverse the digits of a given number
11. To find the number of odd and even digits in a given number.
12. To print the marks list of a class of one subject - using arrays.
13. To find the highest/lowest marks of the students in a subject – using arrays.
14. To print the merit list of the students in descending order using different sorting methods.
15. To find and display the marks of a student using different searching methods.
16. To perform Matrix addition, subtraction and multiplication.
17. To declare/use/differentiate the use of global and local variables.
18. To do problems 2 to 7 using functions
19. To do problems 12 to 16 by passing arrays to functions
20. To swap the values of two variables using pointers.
21. To accept a string and count the characters (length of the string)
22. To convert the characters from Lower to Upper, Upper to Lower and Vice versa
23. To count the number of characters, words and sentences from a string.
24. To create structures of students, employees and pass them to functions.
25. To practice the effective use of Structures and Unions to know the advantages.
26. To calculate the size of a structure or a union
27. To create and read a text file
28. To count the characters, words, sentences from a text file.
29. To convert the text file into a cryptic code by changing the ASCII values.
30. To store and generate the list of the students from a file.
31. To create a random access file and implement a simple banking application
   (To deposit/withdraw amount)

**205- COMPUTER APPLICATIONS IN ACCOUNTING**
(Common to M.Com and M.Com-Computer Applications - under CBCS)
Theory – 3 PPW
Lab: 2 PPW
One Period Lab means 2 hours of Lab Session
Credits= 5

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**Unit-I:** Computerized Accounting – Need, Features and merits – Distinction between Manual Accounting and Computerized Accounting – Limitations of Computerized Accounting – Accounting Packages – Tally, Wings and Ex- integration of Accounting Packages with ERP – Features of Tally – Gateway of Tally – Shortcut keys.

**Unit-II:** Creation of Account groups – Creation Ledgers – With inventory and without inventory – Voucher Types – Payment voucher – Receipt Voucher – Contra Voucher – Sales Voucher – Purchase Voucher – VAT voucher – Credit Note Voucher – Debit Note Voucher – Other types of Voucher – Reversing Journal Voucher. **Inventory Management in Tally** – Stock groups, Categories, items – Inventory Masters – Stock Ledgers – Invoicing – Inventory Vouchers _ Inventory Journals – Purchase and Sales Order Processing – Delivery Notes – Treatment and posting of Sales, Tax, VAT, and other related Taxes.


**Suggested Readings**


**References:**

4. Tally Work Book.

**LAB: COMPUTER APPLICATIONS IN ACCOUNTING**

(Common to M.Com and M.Com-Computer Applications - under CBCS)

Lab: 2 PPW

One Period Lab means 2 hours of Lab Session

-----------------------------------------------

Lab – Students are required to undergo Lab Sessions with Tally Software.

1. Gateway of Tally and Shortcut Keys

2. Creation of Company, Account Groups, Ledgers, with Inventory and without Inventory

3. Creation of different types of Vouchers, Reversing Journal Voucher

4. Creation of Stock Groups, Categories, Items – Inventory Master

5. Inventory Vouchers, Receipt Note, Return Out, Return In, Inventory Journals

7. Sales Book, Purchase Book

8. Statement of Accounts, Trial Balance, Treatment of Depreciation

9. Profit and Loss Account and Balance Sheet

10. Generation of Financial Reports other than Financial Statements

11. Payroll Vouchers, Statement of Payroll

12. Creation of Tax Ledger, TDS Vouchers, Printing TDS Challan

13. TCS Reports

***


**Suggested Readings**


**References**

302 – E- BUSINESS
(Common to M.Com and M.Com-Computer Applications - under CBCS)
Class Hours: 5 ppw
Credits: 5


**Suggested Readings**


**References**

303- SOFTWARE PROJECT MANAGEMENT  
(for M.Com-Computer Applications - under CBCS)

Class Hours: 3 ppw  
Credits: 5

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**Unit-I:** **Introduction to Software Project Management:** Introduction to Software Projects versus other types of Projects, Contract Management and Technical Project Management. **Project Management:** Problems with Software Projects, Setting Objectives, Stakeholders, The business case, Requirement specification, Management Control. **Project Planning:** Introduction. Selection, scope and objectives, infrastructure, characteristics, products and activities. **Project Evaluation:** Introduction to different types of evaluation.

**Unit-II:** **Selection of an appropriate Project Approach:** Choosing technologies, Technical plan contents list, process models, Structure vs speed of delivery, The waterfall model, The V-process model, The Spiral Model, Prototyping. Categorizing prototypes, controlling changes, incremental delivery, dynamic systems, and development methods. Extreme programming, managing iterative process, selecting the most appropriate process model. **Software effort estimation:** Need of estimation, over-and under-estimates. The basis for software estimating, estimating techniques, expert judgment, estimating by analogy, Albrecht function point analysis, function points Mark II, object points, a procedural code-oriented approach, COCOMO: a parametric model.

**Unit-III:** **Activity Planning:** Objectives. When to plan, Project schedules, Projects and activities, Sequencing and scheduling activities, Network planning models, Formulating a network model, Adding the time dimension, The forward pass, backward pass, critical path, Activity float, shortening the project duration, critical activities, Activity-on-arrow networks. **Risk Management:** The nature of risk, Types of risk, Managing risk, Hazard identification, Hazard analysis, Risk planning and control, evaluating risks to the schedule. **Resource Allocation:** The nature of resources, Identifying resource requirement, Scheduling resources, Creating critical paths, counting the cost, being specific, publishing the resource schedule, Cost scheduling sequence.

**Unit-IV:** **Monitoring and Control:** Creating the framework, Collecting the data, Visualizing process, Cost monitoring, Earned value, Prioritizing monitoring, Getting the project back to target, Charge control. **Managing contracts:** Types of contracts, Stages in contract placement, typical terms of a contract, Contract management, Acceptance.

**Unit-V:** **Managing People and Organizing Teams:** Understanding behavior, organizational background, Selecting the right person, Instruction in the best methods, motivation, The Oldham-Hack man job characteristics model. Working in groups, Becoming a team, Decision making, Leadership, Organizational structures, Stress, Health and safety. **Software quality:** Importance of software quality, defining software quality, ISO 9126, practical software quality measures, Product vs Process quality management, External standards, Techniques to help enhance software quality, Quality plans.

**Suggested Readings**


**References**

Lab – Students are required to undergo Lab Sessions with Microsoft Project (Preferably the recent version) List of Experiments:

AIM: Defining a project and the activities to be considered therein. For example, building an auditorium, has several tasks to be performed may be in a sequence (one after another), or in parallel. Using MS project the student needs to have an idea to represent them as project activities. While representing them, the student may also estimate the activity duration and the same may be represented as a tool.

LIST OF EXPERIMENTS

i. Organizing a Common Entrance Test by a University. For example ICET/EAMCET/LAWCET

ii. Software Project being undertaken by an organization, for example, software to be developed for conducting online examination, Automation of Kakatiya University Examination Branch activities starting from question paper setting to the declaration of result of all courses of all disciplines.

iii. Online admission process of an University

iv. Two more case-studies of above type

v. Computation of Critical Path Method(CPM) for any project with activities and their durations

vi. Estimation of project completion time using the concept of PERT (with the consideration of optimistic, most-likely and pessimistic activity durations)

304- SOFTWARE TESTING TOOLS
(For M.Com-Computer Applications - under CBCS)

Class Hours: 3 ppw  Credits: 5


Unit-III:  **Software Testing Tools**: Selecting and Installing Software Testing tools, Automation and Testing Tools Over view of win runner: testing an application using win runner, Test script language (TSL), GUI MAP file, Synchronization of test cases, Data-driven testing, Rapid Test Script Wizard, mapping custom object to a Standard class, checking GUI objects, Load Runner, Win Runner and Rational Testing Tools, Silk test.


**Suggested Readings**


**References:**

1. Perform a context sensitive for opening order using flight reservation application.
2. Perform test for processing of sending a fax.
3. Perform a batch test to execute series of test using calculator application.
4. Perform context sensitive test on flight 1A application, insert GUI check points for single property.
5. Perform context sensitive test on flight 1A application, insert GUI check points for multiple objects.
6. Perform context sensitive test on flight 1A application, insert GUI check points for object/window.
7. Perform context sensitive test on flight 1A application insert bitmap checkpoint for object/window.
8. Perform context sensitive test on flight 1A application insert bitmap checkpoint for screen area.
9. Perform a test for default checkpoint on flight reservation.
10. Perform a test for custom checkpoint on flight reservation.
11. Perform a test for Runtime record checkpoint on flight reservation.
12. Perform a Data Driven test for flight reservation application.
13. Perform a Data Driven test for flight reservation application to open multiple order numbers using data driven Wizard.
14. Perform a Data Driven test for flight reservation application to open multiple order numbers using for loop to dynamically display order.
15. Perform a test using flight application for synchronization for object/window bitmap.
16. Perform a test using flight application for synchronization for object/window.
17. Perform GUI regression test using Rapid Test Script Wizard (RTSW) for calculator application.
   Perform Bitmap Regression test using RTSW for calculator application
18. Perform User Interface test using RTSW for calculator application.
19. Perform Test template test using RTSW for calculator application.
20. Perform GUI checkpoint for single property for calculator application.
22. Perform GUI check point for multiple objects for calculator application
23. Perform Bitmap checkpoint for object/window for calculator application.
24. Perform Bitmap checkpoint for screen area for calculator application.

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305- WEB PROGRAMMING
(for M.Com-Computer Applications - under CBCS)

Class Hours: 3 ppw  
Credits:  5


Unit-II:  HTML and XHTML: Forms, Frames in HTML and XHTML, Syntactic differences between HTML and XHTML. CSS: Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The Box model, Background images, The <span> and <div> tags, Conflict resolution.

Unit-III:  Java Script: Overview of JavaScript; Object orientation and JavaScript; General syntactic characteristics; Primitives, Operations, and expressions; Screen output and keyboard input; Control statements; Object creation and Modification; Arrays; Functions; Constructor; Pattern matching using expressions; Errors in scripts; Examples.

Unit-IV:  Java Script and HTML Documents: The JavaScript execution environment; The Document Object Model; Element access in JavaScript; Events and event handling; Handling events from the Body elements, Button elements, Text box and Password elements.

Unit-V:  Dynamic Documents with Java Script: Introduction to dynamic documents; Positioning elements; Moving elements; Element visibility; Changing colors and fonts; Dynamic content; Stacking elements; Locating the mouse cursor; Reacting to a mouse click; Slow movement of elements; Dragging and dropping elements. XML: Introduction; Syntax; Document structure; Document Type definitions; Namespaces; XML schemas; Displaying raw XML documents; Displaying XML documents with CSS.

Suggested Readings

References
1. Create an html page with 7 separate lines in different sizes. State size and colour of each line in its text.

2. Create a background image called myimage.jpg by using any picture creating tool. Type a sample html program in the text editor and view it through the browser. Modify it to include some blinking text.

3. Create an html page with all the different text styles (bold, italic and underlined) and its Combinations on separate lines. State style of each line in its text.

4. Create an html page containing the polynomial expression as follows  \( a_0 + a_1x + a_2x^2 + a_3 x^3 \)

5. Create an html page with red background with a message “warning” in large size blinking. Add scrolling text “read the message” below it.

6. Create an html page with following specifications
   a. Title should be about myself
   b. Colour the background with pink colour
   c. Place your name at the top of the page in large text and centred
   d. Add names of your family members each in a different size, colour, and style
   e. Add scrolling text with a message of your choice
   f. Add your image at the bottom

7. Create an html page with following specifications
   a. Title should be about my college
   b. Put the windows Logo image in the background
   c. Place your College name at the top of the page in large text followed by address in smaller size
   d. Add names of courses offered each in a different colour, style and typeface
   e. Add scrolling text with a message of your choice
   f. Add college image at the bottom

8. Create an html page with following specifications
   a. Title should be about my City
   b. Place your City name at the top of the page in large text and in blue colour
   c. Add names of landmarks in your city each in a different colour, style and Typeface
   d. One of the landmarks, your college name should be blinking
   e. Add scrolling text with a message of your choice
   f. Add some image at the bottom
9. Create a new file called index. HTML Put the normal HTML document structure tags in the file. Give it a title. At the bottom of the page (i.e. the last thing between the body tags) put the following:
   a. A horizontal rule.
   b. A Link to your email Address (With your name between the tag)
   c. A line break.
   d. The date. (I have this same structure at the bottom of this page).
   e. Above this block (which is called the footer), put a title in heading tags.
   f. Add some text describing yourself (you can split this into multiple headings and Paragraphs if you wish).

10. Create an html program using the body given in the example for ordered list. Modify it to change the colour of the item text to and reduce the size of text one smaller than the heading.

11. Create an html program using the body given in the example for unordered list. Modify it to change the shape of the bullet to and also reduce the size bulleted items one smaller than the heading.

12. Type the sample HTML program using tables. Modify it to remove Rs and paisa column and specify price as 500.50

13. Type the sample HTML program using frames. Create the required html files with appropriate messages. Modify it to change to a different frame structure.

14. Create an html page with appropriate frames containing Heading and other information. Add a bulleted list of your favourite subjects. For each subject make a nested list that contains, teacher name, the start and end time. Add your photograph and message in a separate frame Add link to teacher or college web site wherever teacher name appears

15. Create an html page with appropriate frames containing Heading and other information. Add an ordered list of your educational qualifications. For each course make a nested list that contains, university or board name, the year and the percentage scored. Add link to university site where university name appears. Add your college photograph and message in a separate frame.

16. Create a HTML page that displays the XML data using XML document.

17. Create a XML document and its DTD.


Unit-IV: **Collection and Analysis of Data** -Sources of Data-Primary Sources of Data- Secondary Sources of Data - Data Collection Methods- Interviews: Structured Interviews and Unstructured Interviews-Face to face and Telephone Interviews- Observational Surveys- Questionnaire Construction: Organizing Questions-Structured and Unstructured Questionnaires – Guidelines for Construction of Questionnaires. Data Analysis: An overview of Descriptive, Associational and Inferential Statistical Measures.


**Suggested Readings**

**References**
MASTER OF COMMERCE- FOURTH SEMESTER
402 – INTERNATIONAL BUSINESS
(Common to M.Com and M.Com-Computer Applications - under CBCS)
Class Hours: 5 ppw  Credits:  5


Suggested Readings


References

403- MANAGEMENT INFORMATION SYSTEMS
(For M.Com-Computer Applications - under CBCS)

Class Hours: 5 ppw

Credits: 5

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Suggested Readings


References:

MASTER OF COMMERCE - FOURTH SEMESTER
404- RELATIONAL DATABASE MANAGEMENT SYSTEMS
(For M.Com-Computer Applications - under CBCS)

Class Hours: 3 ppw
Credits: 5

Unit-I: **Introduction:** Data Vs Information, Database and Database Users, Characteristics of the Database Approach, Implications of Database Approach, Advantages of using DBMS, Database System Concepts, Data Models, Schemas, and Instances. DBMS Architecture and Data Independence. The Database System Environment, Classification of DBMS.

Unit-II: **Data Modeling Using the Entity-Relationship Model:** Entity types, Entity sets, attributes, and Keys, ER Model Concepts, Notation for ER Diagrams, Proper naming of Schema Constructs, Relationship types, degrees and cardinalities. Business Rules, Enhanced ER Model – Representing Super type Sub types, Representing Generalization and Specialization, Specifying constraints.

Unit-III: **The Relational Model:** Integrity constraints, Relational tables, transforming EER diagrams into relations, Functional Dependencies and Normalization for Relational Database: Functional Dependencies, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms Based on Primary Keys, Boyce-Codd Normal Form, Denormalization Relational Algebra, File Organization techniques.

Unit-IV: **Relational Database Language:** Data definition in SQL, Queries in SQL, Insert, Delete and Update Statements in SQL, Views, joins in SQL, sorting and grouping in SQL, specifying indexes, Query optimization – strategies – Query decomposition.

Unit-V: **Transaction Processing Concepts:** Introduction, Transaction and System Concepts, Desirable properties of transaction, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL, Locking Techniques for Concurrency Control, Concurrency Control based on time stamp ordering, Overview of distributed data bases – Overview of access control mechanism.

**Suggested Readings**


**References**

Lab – Students are required to undergo Lab Sessions with SQL.

1. The STUDENT DETAIL databases have a table with the following attributes.
   STUDENT (regno: int, name: string, dob: date, marks: int)
   i) Create the above table.
   ii) Remove the existing attributes from the table.
   iii) Change the data type of regno from integer to string.
   iv) Add a new attribute phone number to the existing table.
   v) Enter five tuples into the table.
   vi) Display all the tuples of student table.

2. A LIBRARY database has a table with the following attributes.
   LIBRARY (bookid:int, title:string, author:string, publication:string, yearpub:int, price:real)
   i) Create the above table. Enter five tuples into the table
   ii) Display all the tuples in student table.
   iii) Display the different publishers from the list.
   iv) Arrange the tuples in the alphabetical order of the book titles.
   v) List the details of all the books whose price ranges between Rs. 100 and Rs. 300

3. The SALARY database of an organization has a table with the following attributes.
   EMPSALARY (empcode: int, empname: string, dob: date, department: string, salary:real)
   i) Create the above table. Enter five tuples into the table
   ii) Display all the number of employees working in each department.
   iii) Find the sum of the salaries of all employees.
   iv) Find the sum and average of the salaries of employees of a particular department.
   v) Find the least and highest salaries that an employee draws.

4. Consider the insurance database given below.
   PERSON (driver-id-no: string, name: string, address: string)
   CAR (regno: string, model: string, year: int)
   ACCIDENT (report-no: int, date: date, location: String)
   OWNS (driver-id-no: string, regno: string)
   PARTICIPATED (driver-id-no: string, regno: string, report-no: int, damage-amount: int)
   i) Create the above tables by properly specifying the primary keys and the foreign keys. Enter at least five tuples for each relation.
   ii) Demonstrate how you
      a) Update the damage amount for the car with a specific regno in the accident with Report no 12 to 25000.
      b) Add a new accident to the database.
   iii) Find total number of people who owned cars that were involved in accidents in 2012
   iv) Find the number of accidents in which cars belonging to a specific model were involved
5. Consider the following database of students enrollment in courses and books adopted for each course.

- **STUDENT** (regno: string, name: string, major: string, bdate: date)
- **COURSE** (course-no: int, cname: string, dept: string)
- **ENROLL** (reg-no: string, course-no: int, sem: int, marks: int)
- **BOOK ADOPTION** (course-no: int, sem: int, book-isbn: int)

i) Create the above tables by properly specifying the primary keys and the foreign keys. Enter at least five tuples for each relation.

ii) Demonstrate how you add a new text book to the database and make this book be adopted by some department.

iii) Produce a list of text books (include Course-no, book-isbn, book-title) in the alphabetical order for Courses offered by the 'Computer Science' department that use more than two books.

iv) List any department that has all its adopted books published by a specific publisher.

6. The following tables are maintained by a book dealer

- **AUTHOR** (author-id: int, name: string, city: string, country: string)
- **PUBLISHER** (publisher-id: int, name: string, city: string, country: string)
- **CATLOG** (book-id: int, title: string, author-id: int, publisher-id: int, category: int, year: int, price: int)
- **CATEGORY** (category-id: int, description: string)
- **ORDER DETAILS** (order-no: int, book-id: int, quantity: int)

i) Create above tables by properly specifying the primary keys and the foreign keys. Enter at least five tuples for each relation.

ii) Give the details of the authors who have 2 or more books in the catalog and the price of the books is greater than the average price of the books in the catalog and the year of publication is after 2010.

iii) Find the author of the book which has maximum sales.

iv) Demonstrate how to increase price of books published by specific publisher by 10%.

7. Consider the following database for BANK.

- **BRANCH** (branch-name: string, branch-city: string, assets: real)
- **ACCOUNT** (accno: int, branch-name: string, balance: real)
- **DEPOSITOR** (customer-name: string, accno: int)
- **CUSTOMER** (customer-name: string, customer-street: string, customer-city: string)
- **LOAN** (loan-no: int, branch-name: string, amount: real)
- **BORROWER** (customer-name: string, loan-no: int)

i) Create the above tables by properly specifying the primary keys and foreign keys. Enter at least five tuples for each relation.

ii) Find all the customers who have at least two accounts at the main branch.

iii) Find all customers who have an account at all the branches located in a specific city.

iv) Demonstrate how to delete all account tuples at every branch located in specific city.

8. Consider the following database for ORDER PROCESSING.

- **CUSTOMER** (cust-no: int, cname: string, city: string)
- **ORDER** (orderno: int, odate: date, ord-amt: real)
- **ORDER ITEM** (orderno: int, itemno: int, qty: int)
- **ITEM** (itemno: int, unit price: real)
- **SHIPMENT** (orderno: int, warehouseno: int, ship-date: date)
- **WAREHOUSE** (warehouseno: int, city: string)

i) Create the above tables by properly specifying the primary keys and the foreign keys. Enter at least five tuples for each relation.

ii) List the order number and ship date for all orders shipped from particular warehouse.

iii) Produce a listing: customer name, no of orders, average order amount.

iv) List the orders that were not shipped within 30 days of ordering.

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Unit-II: Constructing Variables – Recoding Existing Variables – Computing the Variables - Univariate Analysis: Descriptive Statistics – Frequencies: Listing, summarizing and Sorting Cases – Mean, Media, Mode, Variance and Standard Deviation, Skewness, Maximum, Minimum, Range, Sum and Standard Error - Creating and Editing Graphs and Charts: Bar, 3-D Bar, Line, Area, Pie, Box-plot, Scatter Dot and Histogram.


Suggested Readings


References


405: DATA ANALYSIS WITH SPSS  
(For M.Com-Computer Applications - under CBCS)

Lab: 2 PPW  
One Period Lab means 2 hours of Lab Session  

Lab – Students are required to undergo Lab Sessions with SPSS Software

1. Exercise on Understanding SPSS menus  
2. Exercise on Understanding Structure of Data and Variable View  
3. Exercise on Creating and Editing a Data File  
4. Exercise on Adding and Dropping Variables  
5. Exercise on Recoding Variables  
6. Exercise on Sorting Cases  
7. Exercise on Merging Files is  
8. Exercise on Importing Files  
9. Exercise on Computing Variable  
10. Exercise on Computation of Mean, Median and Mode  
11. Exercise on Computation of Standard Deviation, Variance and Skewness  
12. Exercise on Computation of Range, Sum, Minimum and Maximum  
13. Exercise on Creating Bar and Line Diagrams  
14. Exercise on Creating Histogram, Pie-Chart and Area Chart  
15. Exercise on Cross Tabulations  
16. Exercise on Computing Correlation  
17. Exercise on Computing Linear Regression  
18. Exercise on Comparing Means  
19. Exercise on One-way Analysis of Variance  
20. Exercise on Computation of Independent Sample t-test  
21. Exercise on Computation of Paired t-test  
22. Exercise on Mann-Whitney U-test  
23. Exercise on Wilcoxon Test  
24. Exercise on Sign Test  
25. Exercise on Runs Test  
26. Exercise on Kolmogorov-Smirnov Test  
27. Exercise on One-Sample Chi-Square Test  
28. Exercise on Friedman One-way ANOVA  
29. Exercise on K-Sample Median Test  
30. Exercise on Factor Analysis  
31. Exercise on Interpretation of Output of Factor Analysis  

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