

TELANGANA UNIVERSITY
NIZAMABAD-503322



B.A Computer Applications Syllabus
Under the

CHOICE BASED CREDIT SYSTEM
(With effect from 2016-17)

DEPARTMENT OF COMPUTER SCIENCE
University College, TU, Nizamabad-503322

Semester	Codes	Subject	Workload per week(Theory/Practical)		Credits
			T (100)	P (50)	
3	Core 3	Database management system	4	2	4+1=5
3	SEC1	A: SciLab – 1	2	nil	2
		B: Python-1			

Core 3: Database Management System

Unit 1

Introduction to Databases: Databases and Database Users, Introduction, Example, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using the DBMS Approach, History of Database Applications, When Not to Use a DBMS.

Database System Concepts and Architecture: Data Models, Schemas, and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, the Database System Environment, Centralized and Client/Server Architectures for DBMSs, Classification of Database Management Systems.

Data Models: Data Modelling and Data Models, the Importance of Data Models, Data Model Basic Building Blocks, Business Rules, the Evolution of Data Models, Degrees of Data Abstraction

Unit II

The Relational Database Model: Logical View of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the System Catalog, Relationships within the Relational Database, Data Redundancy Revisited, Indexes.

Entity Relationship (ER) Modelling: The Entity Relationship Model (ERM)-Entities , Attributes , Relationships , Connectivity and Cardinality , Existence Dependence , Relationship Strength , ,Weak Entities , Relationship Participation , Relationship Degree, Recursive Relationships, Associative (Composite) Entities; Developing an ER Diagram, Database Design Challenges: Conflicting Goals.

Unit III

ADVANCED DATA MODELING: The Extended Entity Relationship Model, Entity Clustering, Entity Integrity: Selecting Primary Keys.

Normalization of Database Tables: Database Tables and Normalization, The Need for Normalization, The Normalization Process, Improving the Design, Surrogate Key Considerations, Higher-Level Normal Forms, Normalization and Database Design, Denormalization.

Unit IV

Introduction to Structured Query Language (SQL): Introduction to SQL, Data Definition Commands, Data Manipulation Commands, SELECT Queries, Advanced Data Definition Commands, Advanced SELECT Queries, Virtual Tables: Creating a View, Joining Database Tables.

Advanced SQL: Relational Set Operators, SQL Join Operators, Subqueries and Correlated Queries, SQL Functions, Oracle Sequences, Updatable Views, Procedural SQL, Embedded SQL.

Text Books:

1. Peter Rob and Carlos Coronel, Database Systems: Design, Implementation, and Management, Thomson, Eighth Edition, 2009
2. R. Elmasri,S. Navathe, Fundamentals of Database Systems, Pearson Education, sixth Edition, 2011

Book references:

1. MySQL : Reference Manual
2. Spoken Tutorial on “MySQL”, as E-resource for Learning, <http://spoken-tutorial.org>

Practical: Database Management System

NOTE:

All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

Faculty must take care about UG standard programs it should be minimum 25 – 30.

In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

External Viva-voce is compulsory.

Example programs:

1. Create a database having two tables with the specified fields, to computerize a library system of a Delhi University College.

LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price)

IssuedBooks (Accession number, Borrower)

a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

b) Delete the record of book titled “Database System Concepts”.

c) Change the Department of the book titled “Discrete Maths” to “CS”.

d) List all books that belong to “CS” department.

e) List all books that belong to “CS” department and are written by author “Navathe”.

f) List all computer (Department=”CS”) that have been issued.

g) List all books which have a price less than 500 or purchased between “01/01/1999” and “01/01/2004”.

2. Create a database having three tables to store the details of students of Computer Department in your college.

Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)

Paper Details (Paper code, Name of the Paper)

Student's Academic and Attendance details (College roll number, Paper code, Attendance, Marks in home examination).

- a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
- b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.
- c) List all students who live in "Delhi" and have marks greater than 60 in paper 1.
- d) Find the total attendance and total marks obtained by each student.
- e) List the name of student who has got the highest marks in paper 2.

3. Create the following tables and answer the queries given below:

Customer (CustID, email, Name, Phone, ReferrerID)

Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)

BicycleModel (ModelNo, Manufacturer, Style)

Service (StartDate, BicycleID, EndDate)

- a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
- b) List all the customers who have the bicycles manufactured by manufacturer "Honda".
- c) List the bicycles purchased by the customers who have been referred by customer "C1".
- d) List the manufacturer of red colored bicycles.
- e) List the models of the bicycles given for service.

4. Create the following tables, enter at least 5 records in each table and answer the queries given below.

EMPLOYEE (Person_Name, Street, City)

WORKS (Person_Name, Company_Name, Salary)

COMPANY (Company_Name, City)

MANAGES (Person_Name, Manager_Name)

1. Identify primary and foreign keys.
2. Alter table employee, add a column "email" of type varchar(20).
3. Find the name of all managers who work for both Samba Bank and NCB Bank.

4. Find the names, street address and cities of residence and salary of all employees who work for “Samba Bank” and earn more than \$10,000.
5. Find the names of all employees who live in the same city as the company for which they work.
6. Find the highest salary, lowest salary and average salary paid by each company.
7. Find the sum of salary and number of employees in each company.
8. Find the name of the company that pays highest salary.
5. Create the following tables, enter at least 5 records in each table and answer the queries given below.

Suppliers (SNo, Sname, Status, SCity)

Parts (PNo, Pname, Colour, Weight, City)

Project (JNo, Jname, Jcity)

Shipment (Sno, Pno, Jno, Qunatity)

- a) Identify primary and foreign keys.
- b) Get supplier numbers for suppliers in Paris with status>20.
- c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
- d) Get suppliers names for suppliers who do not supply part P2.
- e) For each shipment get full shipment details, including total shipment weights.
- f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.
- g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.
- h) Get the names of cities that store more than five red parts.
- i) Get full details of parts supplied by a supplier in Delhi.
- j) Get part numbers for part supplied by a supplier in Allahabad to a project in Chennai.
- k) Get the total number of project supplied by a supplier (say, S1).
- l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

Unit – I

Introduction to Scilab – what is scilab, downloading & installing scilab, a quick taste of scilab.

The Scilab Environment – manipulating the command line, working directory, comments, variables in memory, recording sessions, the scilab menu bar, demos.

Scalars & Vectors – introduction, initializing vectors in scilab, mathematical operations on vectors, relational operations on vectors, logical operations on vectors, built-in logical functions.

Unit – II

Scalars & Vectors – elementary mathematical functions, mathematical functions on scalars, complex numbers, trigonometric functions, inverse trigonometric functions, hyperbolic functions.

Matrices – introduction, arithmetic operators for matrices, basic matrix processing.
Polynomials – introduction, creating polynomials, basic polynomial commands, finding roots of polynomial, polynomial arithmetic, miscellaneous polynomial handling.

Text Er. Hema Ramachandran, Dr. Achuthsankar S. Nair, Computer SCILAB–A Free Software to MATLAB

References

1. Digite, Introduction to Scilab
2. Digite, Optimization in Scilab
3. Scilab Enterprises, Scilab for Very Beginners
4. Digite, Introduction to Discrete Probabilities with Scilab
5. Spoken Tutorial on “Scilab” as E-resource for Learning:- <http://spoken-tutorial.org>

SEC–1[B] Python – 1

Unit – I

Introduction to Python: Python, Features of Python, Execution of a Python Program, Viewing the Byte Code, Flavors of Python, Python Virtual Machine, Frozen Binaries, Memory Management in Python, Garbage Collection in Python, Comparisons between C and Python, Comparisons between Java and Python.

Writing Our First Python Program: Installing Python for Windows, Installing numpy, Setting the Path to Python, Writing Our First Python Program, Executing a Python Program, Getting Help in Python, Getting Python Documentation Help, Reopening the Python Program in IDLE.

Data types in Python: Comments in Python, Doc strings, How Python Sees Variables, Data types in Python, Built-in data types, bool Data type, Sequences in Python, Sets, Literals in Python, Determining the Data type of a Variable, What about Characters, User-defined Data types, Constants in Python, Identifiers and Reserved words, Naming Conventions in Python.

Unit – II

Operators in Python: Arithmetic Operators, Assignment Operators, Unary Minus Operator, Relational Operators, Logical Operators, Boolean Operators, Bitwise Operators, Membership Operators, Identity Operators, Operator Precedence and Associativity, Mathematical Functions.

Input and Output: Output statements, Input Statements, Command Line Arguments.

Control Statements: Control Statements, The if Statement, A Word on Indentation, The if ... else Statement, The if ... elif ... else Statement, The while Loop, The for Loop, Infinite Loops, Nested Loops, The else Suite, The break Statement, The continue Statement, The pass Statement, The assert Statement, The return Statement.

Text R. Nageswara Rao, Corer Python Programming, Dreamtech Press

References

1. Mark Lutz, Learning Python
2. Tony Gaddis, Starting Out With Python
3. Kenneth A. Lambert, Fundamentals of Python
4. James Payne, Beginning Python using Python 2.6 and Python 3
5. Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3.

Semester	Codes	Subject	Workload per week(Theory/Practical)		Credits
			T (100)	P (50)	
4	Core 4	Internet Technologies	4	2	4+1=5
4	SEC2	A: SciLab – 2	2	nil	2
		B: Python-2			

Core 4: Internet Technologies

Unit – I

HTML- Basic HTML, The document body, Text, Hyperlinks, Adding More Formatting, Lists, Using Color and Images, Images, Tables, Frames, Forms- Toward Interactivity .

Cascading Stylesheets - Introduction, Inline Styles, Embedded Style Sheets, Linking external sheets, Backgrounds, text flow and box model.

Unit - II

JavaScript- Introduction, simple programming, Obtaining User Input with prompt Dialogs, Operators (arithmetic, Decision making, assignment, logical, increment and decrement). Control Structures - if... else selection statement, while, do... while repetitions statement, for statement, switch statement, break and continue statements.

Functions - program modules in JavaScript, programmer defined functions, function definition, Random-number generator, scope rules, global functions, recursion,

Unit – III

JavaScript: Arrays, Objects - Math Object, String Object, Date Object, Boolean & Number Object, document and window Objects. Event Model - on click, on load, on error, onmouseover, onmouseout, on focus, on blur, on submit, on reset, more DHTML events.

Unit - IV

Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, Math, Other Markup Languages, and Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

Text books:

1. Internet & World Wide Web- H. M. Deitel, P.J. Deitel, A. B. Goldberg-Third Edition

References:

1. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer

2. URL: www.wikipedia.org

3. HTML A Beginner's Guide, Tata McGraw-Hill Education, 2009.

4. J. A. Ramalho, Learn Advanced HTML 4.0 with DHTML, BPB Publications, 2007

Practical: Internet Technologies

NOTE:

All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

Faculty must take care about UG standard programs it should be minimum 25 – 30.

In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

External Viva-voce is compulsory.

Example programs:

Practical exercises based on concepts listed in theory using HTML.

1. Create HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
2. Create HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking
3. Create HTML document with Table:

			Some image here	

4. Create Form with Input Type, Select and Text Area in HTML.
5. Create an HTML containing Roll No., student’s name and Grades in a tabular form.
6. Create an HTML document (having two frames) which will appear as follows:

About department	
Department1	This frame would show the contents according to the link clicked by the user on the left Frame.
Department1	
Department1	

7. Create an HTML document containing horizontal frames as follows:

Department Names (could be along with Logos)
Contents according to the Link clicked

8. Create a website of 6 – 7 pages with different effects as mentioned in above problems.

9. Create HTML documents (having multiple frames) in the following three formats:

FRAME1`
FRAME2

Frame1	
Frame 2	Frame 3

10. Create a form using HTML which has the following types of controls:

I. Text Box

II. Option/radio buttons

III. Check boxes

IV. Reset and Submit buttons

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11. Create a student Bio-Data, using forms.

12. Create a web page using following style sheets

i. Inline style sheets. ii. Embedded style sheets. iii. External style sheets

13. Create a web page using "class" style sheets with different "border-width" property values like thick, medium, thin, groove, inset, and outset, red & blue.

JavaScript:

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.

2. Print the largest of three numbers.

3. Find the factorial of a number n.
4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these numbers.
5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.
6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.
7. Write a JavaScript program to accept two values from form and apply any 5 mathematical functions.
8. Display the current date and time in both GMT and local form.
9. Write a JavaScript program on MouseOver, MouseOut, blur events.
10. Write a XML program using document type definitions
11. Write Student database with XML.
12. Write a XML program using XS

SEC-2 [A]

SciLab – 2

Theory

2 Hours/Week

2 credits

Unit – I

Programming in scilab – introduction, variables & variable names, assignment statements, arithmetic, relational, logical operators, input & output, flow control/branching/conditional statements, break and continue, handling matrices with loops, scripts, the concept of functions, user defined functions, special function commands.

Menus and Dialog Boxes – introduction, a simple menu example, scilab window with greetings menu added, executing submenus from command line, linking menus to scilab code from external files, entering data through dialog boxes, printing a message in a message box, dialog box for entering a matrix.

Unit – II

Graphic Output – introduction, 2d plotting, function versions for graphic commands, 3d plotting, other graphic primitives, other graphic commands. String Handling Functions – symbolic processing in scilab, creation of a linear combination of arguments, string to ASCII conversion, creation of a string of blank characters, conversion of a string to uppercase and lowercase, string matching, string concatenation, reversing a string, replacement of a string by another, length of a string, type checking.

Statistics – introduction, basic statistical functions, applying statistical functions on matrices, distributions, frequency of values of a matrix or vector, centre, weighted centre, central moment, correlation, covariance, variance matrix, percentiles, frequencies, cumulative sum, difference of two independent samples, fisher test.

Text Er. Hema Ramachandran, Dr. Achuthsankar S. Nair, Computer
SCILAB–A Free Software to MATLAB

References

1. Digite, Introduction to Scilab
2. Digite, Optimization in Scilab
3. Scilab Enterprises, Scilab for Very Beginners
4. Digite, Introduction to Discrete Probabilities with Scilab

SEC-2[B]

Python – 2

Theory 2 Hours/Week 2 credits

Unit – I

Arrays in Python: Array, Advantages of Arrays, Creating an Array, Importing the Array Module, Indexing and Slicing on Arrays, Processing the Arrays, Types of Arrays, Working with Arrays using numpy, Creating Arrays using array(), linspace, logspace, arange(), zeros() and ones() Functions, Mathematical Operations on Arrays, Comparing Arrays, Aliasing the Arrays, Viewing and Copying Arrays, Slicing and Indexing in numpy Arrays, Dimensions of Arrays, Attributes of an Array, The reshape() Method, The flatten() Method, Working with Multi-dimensional Arrays, Indexing in Multi-dimensional Arrays, Slicing the Multi-dimensional Arrays, Matrices in numpy, Getting Diagonal Elements of a Matrix, Finding Maximum and Minimum Elements, Finding Sum and Average of Elements, Products of Elements, Sorting the Matrix, Transpose of a Matrix, Matrix Addition and Multiplication, Random Numbers.

Strings and Characters: Creating Strings, Length of a String, Indexing in Strings, Slicing the Strings, Repeating the Strings, Concatenation of Strings, Checking Membership, Comparing Strings, Removing Spaces from a String, Finding Sub Strings, Counting Substrings in a String, Strings are Immutable, Replacing a String with another String, Splitting and Joining Strings, Changing Case of a String, Checking Starting and Ending of a String, String Testing Methods, Formatting the Strings, Working with Characters, Sorting Strings, Searching in the Strings, finding Number of Characters and Words, Inserting Sub String into a String.

Unit – II

Functions: Difference between a Function and a Method, Defining a Function, Calling a Function, Returning Results from a Function, Returning Multiple Values from a Function, Functions are First Class Objects, Pass by Object Reference, Formal and Actual Arguments, Positional Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Local and Global Variables, The Global Keyword, Passing a Group of Elements to a Function, Recursive Functions, Anonymous Functions or Lambdas, Function Decorators, Generators, Structured Programming, Creating our Own Modules in Python, The Special Variable name.

Lists and Tuples: List, Creating Lists using range() Function, Updating the Elements of a List, Concatenation of Two Lists, Repetition of Lists, Membership in Lists, Aliasing and Cloning Lists, Methods to Process Lists, Finding Biggest and Smallest Elements in a List, Sorting the List Elements, Number of Occurrences of an Element in the List, Finding Common Elements in Two Lists, Storing Different Types of Data in a List, Nested Lists, Nested Lists as Matrices, List Comprehensions, Tuples, Creating Tuples, Accessing the Tuple Elements, Basic Operations on Tuples, Functions to Process Tuples, Nested Tuples, Inserting Elements in a Tuple, Modifying Elements of a Tuple, Deleting Elements from a Tuple.

Dictionaries: Operations on Dictionaries, Dictionary Methods, Using for Loop with Dictionaries, Sorting the Elements of a Dictionary using Lambdas, Converting Lists into Dictionary, Converting Strings into Dictionary, Passing Dictionaries to Functions, Ordered Dictionaries.

Text R. Nageswara Rao, Corer Python Programming, Dreamtech Press

References

1. Mark Lutz, Learning Python
2. Tony Gaddis, Starting Out With Python
3. Kenneth A. Lambert, Fundamentals of Python
4. James Payne, Beginning Python using Python 2.6 and Python 3
5. Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3