

Bachelor of Computer Applications

Course Timings : 1 pm TO 5.30 pm

Course Highlights

- To provide quality education to the students through latest technology development in Computer science.
- To provide a learning environment that helps students to enhance problem solving skills, be successful in their professional lives and to prepare students to be life long learners by offering a solid theoretical foundation in computing along with applied computing experiences and educating them about their professional and ethical responsibilities.
- To establish Industry Institute Interaction to make students ready for the industrial environment.
- To provide exposure to students to the latest tools and technologies in the area of computer software.

Job opportunities

Students can get job in IT Industries as

- ✓ Software Services/Developers
- ✓ Business Process Management (BPM/BPO)
- ✓ Web Development
- ✓ Engineering services
- ✓ Computer hardware.
- ✓ Banking and Telecommunications

	Part	Subject	Subject code	Title of the Paper	Credits	CIA	ESE	TOTAL
I Year I Sem	I	Language (Tamil/Hindi/Sanskrit)	16ULTFC1A01,17U LHFC1001,17ULSFC 1001	Tamil - I/Hindi- I/Sanskrit-I	3	25	75	100
	II	English	16UGEF1A01	General English - I	3	25	75	100
	III	Core Major 1	16UACT1A01 UCA/CT/1A01	Programming in C	4	25	75	100
	III	Core Practical 1	16UCACP1A01 UCA/CP/1A01	Programming in C Lab	2	20	30	50
	III	Core Practical 2	13UCACP1002 UCA/CP/1002	Multimedia Lab	2	20	30	50
	III	Allied 1	15UCAAT1AM1 UCA/AT/1AM1	Allied Mathematics-I	5	25	75	100
	IV	Soft skill -I	18USSLC1001	Essentials of Language & Communication Skills	3	50	-	100
I Year II Sem	I	Language (Tamil/Hindi/Sanskrit)	16ULTFC2A02,17U LHFC2002,17ULSFC 2002	Tamil - II/Hindi- II/Sanskrit-II	3	25	75	100
	II	English	16UGEF2A02	General English-II	3	25	75	100
	III	Core Major 2	16UACT2A02 UCA/CT/2A02	Internet Programming	3	25	75	100
	III	Core Practical 3	16UCACP2A03 UCA/CP/2A03	Internet Programming Lab	2	20	30	50
	III	Core Practical 4	13UCACP2004 UCA/CP/2004	Unix Lab	2	20	30	50

	III	Allied 2	15UCAAT2AM2 UCA/AT/2AM2	Allied Mathematics- II	5	25	75	100
	IV	Soft skill -II	18USSSP2002	Essentials of spoken and presentation skills	3	50	-	100
	IV	Value Education	18UESVE2001	Environmental Studies	2	50	-	100
	IV	Value Education	18UYGVE2002	Part I-Yoga	1	50	-	100
II Year III Sem	III	Core Major 3	13UCACT3003 UCA/CT/3003	Objectoriented programming with C++	3	25	75	100
	III	Core Major 4	11UCACT3004 UCA/CT/3004	Data Structures and algorithms	4	25	75	100
	III	Core Major 5	17UCACT3005	Internet of Things	4	25	75	100
	III	Core Practical 5	13UCACP3005 UCA/CP/3005	C++ Lab	2	20	30	50
	III	Core Practical 6	13UCACP3006 UCA/CP/3006	Data structures Lab	2	20	30	50
	III	Allied 3	18UCAAT3FA3	Financial Accounting	5	25	75	100
	IV	Non-Major elective	18UCANE3001	Introduction to Cyber Security	2	50		100

II Year IV Sem	III	Core Major 6	08UCACT4006 UCA/CT/4006	Computer Architecture	4	25	75	100
	III	Core Major 7	08UCACT4007 UCA/CT/4007	Database Management Systems	4	25	75	100
	III	Core Major 8	08UCACT4008 UCA/CT/4008	Visual Programming	4	25	75	100
	III	Core Practical 7	14UCACP4A07 UCA/CP/4A07	VB & SQL Lab	2	20	30	50
	III	Core Practical 8	13UCACP4008 UCA/CP/4008	Tally and SPSS Lab	2	20	30	50
	III	Allied 4	18UCAAT4CM4	Cost and Management Accounting	5	25	75	100
	IV	Non-Major elective	18UCANE4002	Introduction to Cyber Security	2	50		100
III Year V Sem	III	Core Major 9	13UCACT5009 UCA/CT/5009	Programming in Java	3	25	75	100
	III	Core Major 10	13UCACT5010 UCA/CT/5010	Programming in PHP and MYSQL	3	25	75	100
	III	Core Major 11	08UCACT5011 UCA/CT/5011	Operating systems	4	25	75	100
	III	Core Practical 9	13UCACP5009 UCA/CP/5009	Java Programming Lab	2	20	30	50

	III	Core Practical 10	13UCACP5010 UCA/CP/5010	PHP and MYSQL Lab	2	20	30	50
	III	Elective 1	13UCACE5A01 UCA/CE/5A01	Resource Management Techniques	5	25	75	100
	IV	Skill Based Elective	18USSSE5CA3	Any one from the list	3	50	-	100
III Year VI Sem	III	Core Major 12	10UACT6012 UCA/CT/6012	Data Communication and Networking	4	25	75	100
	III	Core Major 13	13UACT6013 UCA/CT/6013	Web Technology	4	25	75	100
	III	Core Practical 11	13UCACP6011 UCA/CP/6011	Web Technology Lab	2	20	30	50
	III	Elective 2	13UCACE6A02 UCA/CE/6A02	Software Engineering and Testing	5	25	75	100
	III	Elective 3	18UCACE6C03 UCA/CE/6C03	Data Mining	5	25	75	100
	III	Major Project 1	13UCAPR6001 UCA/PR/6001	Mini Project	2	20	30	50
	IV	Skill Based Elective	18USSCS6004	Computing Skills SWAYAM – MOOC	3	50	-	100
	IV	Value Education	18UYGVE6003	PART II- Values in Daily life	1	50	-	100

SEMESTER I		
PROGRAMMING IN C		
SUB CODE: 16UACT1A01 ,UCA/CT/1A01		MAX MARKS:75
Course outline	Unit-1:	C fundamental Character set – identifiers and keywords – data types –constants – variables –declaration –expression – statements –arithmetic, unary, relational and logical, assignment and conditional operator –library functions
	Unit-2:	Data input output functions –simple C programs –Flow of Control –if, if-else, while, do-while, for loop, Nested control structures – Switch, break and continue, go to statements – comma operator.
	Unit-3:	Functions – definition - proto-types - passing arguments - recursion. Storage classes - Automatic, External, and Static, Register variables.
	Unit-4:	Arrays – Defining and processing – passing arrays to functions - Multi-Dimension arrays - Arrays and string.Structures – User defined data types- passing structures to functions – self-referential structures – Unions – Bit-wise operations.
	Unit-5:	Pointers –declarations – passing pointers to functions – Operation in pointers –pointer and Arrays – Arrays of pointers – structure and pointers –Files: creating, processing, opening and closing a data file.

Books for Study:	Balagurusamy , Programming in C, TMH.
	Kanetkar Y. Let us C, BPB pub, New Delhi, 1999.
Books for Reference:	H.schildt, C: The complete reference, 4th Edition, THM Edition, 2000.
	Gottfried, B.S, programming with c, second Edition, THM pub. Co. ltd., New Delhi 1996.
	B.w. Kernighan and D.M.Ritchie, The C programming Language, 2 nd Edition, PHI, 1988.

SEMESTER I

C PROGRAMMING LAB

SUB CODE: 16UCACP1A01 ,UCA/CP/1A01

MAX MARKS:30

Exercises	I. Control structures
	1. Generate 'n' prime number.
	II String manipulation :
	3. Counting the no. of vowels, consonants, words, white spaces in a line of text
	4. Reverse a string and check for palindrome.
	III Functions:
	6. Fibonacci sequence.
	7. Maximum and Minimum.
	IV Recursion :
	V Matrix Manipulation :
	10. Transpose of a matrix

VI Pointers

11. Write a function using pointers to add two matrices and to return the resultant matrix to the calling function.
12. Write Insertion sort program using array of pointers.
13. Write a binary search program using array of pointers.

VI Files

14. Write a C program which receives two filenames as arguments and check whether the file contents are same or not. If same delete the second file.

SEMESTER I	
MULTIMEDIA LAB	
SUB CODE: 13UCACP1002,UCA/CP/1002	
MAX MARKS:30	
Exercises	<p>I GIMP</p> <ol style="list-style-type: none"> 1. Implementation of different Selection Tool. 2. Applying different View Options. 3. Implementation of Transforming and sizing. 4. Images-adding, Deleting and Moving. 5. Layers-Implementation of Paint Tool. 6. Implementation of Transform Tool. 7. Implementation of different Filters. 8. Implementation of different Color Tools <hr/> <p>II – :BLENDER</p> <ol style="list-style-type: none"> 11. Getting Started 12. Modeling 13. Animation 14. Lighting and Rendering

Websites	<p>http://docs.gimp.org/2.4/en/</p> <p>http://blender.org/education-help/tutorials</p> <p>http://blenderguru.com</p>
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SEMESTER II		
INTERNET PROGRAMMING		
SUB CODE: 16UACT2A02 ,UCA/CT/2A02		MAX MARKS:75
Course outline	Unit-1:	Internet basics, introduction to HTML, list, creating tables, linking documents, frames, graphics to HTML documents, style sheet basics, adding styles to documents.
	Unit-2:	: Creating style sheet tools, style sheet properties, font, text, list, colour and background colour, box, display properties.
	Unit-3:	Introduction to JavaScript, Advantages of JavaScript, JavaScript Syntax, data types, variables , arrays. Operators and Expressions, Looping constructors, functions, dialog box, JavaScript, document object model.
	Unit-4:	Introduction – objects in HTML, event handling, window object, document object, browser object, object methods, built-in objects, user defined objects, cookies.
	Unit-5:	DHTML, cascading style sheets, class, external style sheets, working with JavaScript style sheet.

Books for Study:	1.	Ivan Bayross – Web Enabled Commercial Application Development, HTML, DHTML, JAVASCRIPT, PERL ,CGI
Books for Reference:	2.	Mastering in Javascript – Jaworski, James – BPB pub.

SEMESTER II

INTERNET PROGRAMMING LAB

SUB CODE: 16UCACP2A03 , UCA/CP/2A03

MAX MARKS:30

Exercises

I HTML

1. Create a Web Page for your Personal Information using text formatting tags.
2. Create a web page to display railway train timings.
3. Create a sample web page to promote a product using frames and links.
4. Working with lists

II – JAVASCRIPT:

1. Create a javascript program to sort the given numbers in ascending and descending order.
2. Factorial of a number
3. Fibonacci series
4. Working with mouse events
5. Manipulation of Strings
6. Create a web page for getting personal details using form controls
7. Write a program to design a calculator

III - Cascading style sheet

1. Box property in CSS
2. Font property in CSS

SEMESTER II

UNIX LAB

SUB CODE: 13UCACP2004,UCA/CP/2004

MAX MARKS:30

Exercises

1. Write a shell script which receives two file names as arguments. Check whether the file contents are same or not. If same delete the second file.
2. Write shell script, which gets executed the moment the user logs in, it, should display the message GOOD MORNING/GOOD AFTERNOON/GOOD EVENING depending on the time and user logs in.
3. Write a function GO which would change the \$ prompt to the current directory name in which you are working. Thus if you are working in \usr\acc the prompt should look like \usr\acc.
4. Write a shell script which displays a) List of all files in the current directory to which you have read, write and execute permissions. b) Receive any number of filenames as arguments and check whether the argument supplied is a file or directory. If it is a directory it should appropriately reported. If it is a filename then name of the file as well as the number of lines present in it should be reported.
5. Write a shell script to search a file from the current directory in any of the sub-directories and report the path.
6. Create a file called TEST which contains sample data as follows. A00001 Shanthi 80,A00007Arun 70 ,S00005 Karthi 50 . Answer the following questions based on the above.
 - Display the contents of the file sorted according to the marks in the descending order.
 - Display the names of the students in the alphabetical order ignoring the cases.
 - Display the list of students who have scored marks between 60 and 80.
 - Display the list of students and their register number.
7. Write a shell script to check if the inputs string is a palindrome.
8. Write a shell script to accept two file names and check whether both exist. If the second file name exists then the contents of the first file name should be appended to it. If the second file name does not exist then create a new file with the contents of the first file name.
9. Write a shell script to accept a number in the command line and display the sum up to that number.
10. Write a shell script to prepare a pay slip.

SEMESTER III		
OBJECT ORIENTED PROGRAMMING WITH C++		
SUB CODE: 13UCACT3003,UCA/CT/3003		MAX MARKS:75
Course outline	Unit-1:	Principles of Object Oriented Programming (OOP)-Software evaluation-OOP Basic Concepts of OOP-benefits of OOP-Application of OOP.
	Unit-2:	Introduction to c++-Tokens-Keywords-Identifiers-Variables-operators-Manipulators-Expressions and Control Structures-Pointers-Functions-Function Prototyping parameters Passing in Functions-Values return by Functions-Inline functions-Friend and Virtual functions.
	Unit-3:	Classes and objects-Constructors-Operator overloading-Type Conversions-Type of Constructors-Function Overloading.
	Unit-4:	Inheritance-Types of Inheritance-Virtual Functions and Polymorphism Constructors in inheritance-Mapping Console I/O operations.
	Unit-5:	Files-File Operations-File pointer-Error Handling during file operations-Command line arguments.

Books for Study:	1.	E.Balaguruswamy-Object Oriented Programming With C++-TMH.
Books for Reference:	1.	Robert Lafore-Object Oriented Programming in Microsoft C++-Galgotia.
	2.	Venugopal – Programming with C

III SEMESTER		
DATA STRUCTURES AND ALGORITHMS		
SUB CODE: 11UCACT3004,UCA/CT/3004		MAX MARKS:75
Course outline	Unit-1:	Definition of Data Structure-Primitive and Composite Data Types, Asymptotic notations, Arrays, Operations on Arrays, Order lists.
	Unit-2:	Stacks-Application of Stack-Infix to Postfix Conversion, Recursion, Maze Problems-Queues-Operations on Queues, Queue Application, Circular Queue,
	Unit-3:	Singly Linked List-Operations, Application-Representation of a Polynomial, Polynomial addition; Doubly Linked List-Operations, Applications-Ordering of Books in Library(Alphabetical Ordering).
	Unit-4:	Trees and Graphs: Binary Trees-Conversion of Forest to Binary Tree, Operations-Tree Traversals; Graph-Definition, Types of Graphs, Hashing Table and Hashing Functions, Traversal-Shortest Path; Dijkstra's Algorithm.
	Unit-5:	Algorithm-Definition - Examples-Complexity-Divide and Conquer-Binary Search-Maximum and Minimum-Merge Sort.

Books for Study:	1.	E.Horowitz and S.Shani Fundamentals of Data Structures in C++, Galgotia Pub.1999.
	2.	P.Sudharsan and J.JohnManoj Kumar ,C++ & Data Structures, RBA Publications, First Edition
Books for Reference:	1.	Horowitz, S.Sahni,andS.Rajasekaran, Computer Algorithms, Galgotia Pub. Pvt. Ltd., 1998.
	2.	R.Kruse C.L. Tondo and B.Leung,Data Structures and Program design in C, PHI, 1997.

III SEMESTER

INTERNET OF THINGS

SUB CODE:17UACT3005

MAX MARKS:75

Course outline	Unit-1:	M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.
	Unit-2:	M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-
	Unit-3:	An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking
	Unit-4:	IoT Technology Fundamentals-Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management.
	Unit-5:	IoT Architecture-State of the Art – Introduction, State of the art,Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference Model

Books for Study:	1.	Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1st Edition, Academic Press, 2014.
Books for Reference:	1.	Vijay Madisetti and Arshdeep Bahga, “Internet of Things (A Hands-on-Approach)”, 1stEdition, VPT, 2014.
	2.	Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013

SEMESTER III

C ++ LAB

SUB CODE: 13UCACP3005 , UCA/CP/3005

MAX MARKS:30

Exercises

Functions

1. Add the specific no. of distance values using inline function

Classes and Objects

1. Construct a class for storage of dimensions of circle, triangle and rectangle and calculate their areas.
2. Perform arithmetic operation on complex data using class and object.

Recursion

1. Perform Binary search
2. Print String backwards
3. Factorial of a number

Polymorphism

1. Overload Unary operator
2. Overload Binary operator
3. Overload operators using friends

Inheritance

1. Illustrate multilevel inheritance
2. Resolve ambiguity in multiple inheritance (virtual base class)

Pointers

1. Illustrate the use of THIS operator

Virtual and Friend Functions

1. Illustrate runtime polymorphism
2. Illustrate working of a friend function

File Handling in C++

1. Copy a text file to another
2. Create a file of objects and display the objects stored in the file

Templates

1. Find largest value contained in an array

SEMESTER III

DATA STRUCTURES LAB

SUB CODE: 13UCACP3006, UCA/CP/3006

MAX MARKS:30

Exercises

1. Implement PUSH,POP operations of stack using Arrays.
2. Implement PUSH,POP operations of stack using Pointers.
3. Implement add,delete operations of a queue using Arrays.
4. Implement add,deleteoperatios of a queue using Pointers.
5. Conversion of infix to postfix using stack operations.
6. Postfix Expresssion Evaluation.
7. Addition of two polynomials using Arrays
8. Addition of two polynomials using Pointers.
9. Creation, Insertion,and Deletion in doubly linked list.
10. Binary tree traversals(in-order,pre-order,and post-order) using linked list.

SEMESTER III		
FINANCIAL ACCOUNTING		
SUB CODE:18UCAAT3FA3		MAX MARKS:75
Course outline	Unit-1:	The Accounting Structure: Basic accounting concepts and Conventions – Meaning of accounting – Groups interested in accounting information.
	Unit-2:	Journal & ledger, Subsidiary books, trial balance preparation (simple problems)
	Unit-3:	Final Accounts (Simple Problems)
	Unit-4:	Depreciation accounting – Meaning of depreciation – Methods of providing depreciation – Fixed percentage on original cost – Fixed percentage on diminishing balance. (Simple Problems)
	Unit-5:	Branch accounts: Debtors system – Departure accounts-basic for allocation of expenses-inter department transfer at cost-treatment of expenses which cannot be allocated.

Books for Study:	1.	T.S. Reddy & A. Murthy – Financial Accounting.
Books for Reference:	1.	S.P. Jain & K.L Narang – Financial Accounting
	2.	Gupta R.L Advanced Accountancy, S.Chand, Delhi

DEPARTMENT OF COMPUTER APPLICATIONS

THREE SEMESTER

NON MAJOR ELECTIVE FOR OTHER DEPARTMENTS (2 hrs/week)

SEMESTER III		
INTRODUCTION TO CYBER SECURITY		
SUB CODE: 18UCANT3001		MAX MARKS:50
Course outline	Unit-1:	Introduction to Cyber Crime - Classification of Cyber Crimes – Reasons for commission of Cyber Crimes.
	Unit-2:	Malware and Its Types - Kinds of Cyber Crimes.
	Unit-3:	Cyber Security Techniques - Firewall and its uses.

Reference Link:	1.	http://uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf
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SEMESTER IV		
COMPUTER ARCHITECTURE		
SUB CODE: 08UACT4006,UCA/CT/4006		MAX MARKS:75
Course outline	Unit-1:	Data representation - Data types - complements, fixed point and floating point representation other binary codes - micro operations: Register transfer language, Register transfer, Bus and Memory transfer, Arithmetic, logic, and shift micro operations, Arithmetic logic shift unit - micro programmed control - control memory - Address sequencing - micro program example - design of control unit.
	Unit-2:	Central processing unit: General register and stack organizations, instruction formats - Addressing modes, Data transfer and manipulation - program control, RISC - Pipelining - Arithmetic and instruction, RISC pipeline - Vector processing and Array processors.
	Unit-3:	Computer Arithmetic - Addition and subtraction, Multiplication and division, floating point and decimal Arithmetic operations
	Unit-4:	Input-output organization - peripheral devices, I/O interface, Asynchronous data transfer, modes of transfer, priority interrupt, direct memory access, I/O processor, serial communications.
	Unit-5:	Memory organization - Memory hierarchy - main memory - Auxiliary memory - associative, cache and virtual memory, memory management hardware - multi processors: Interconnection structures, Inter processor arbitration.

Books for Study:		1.Mano, Computer System architecture. PHI (Third Edition) 1993
		2.P.NaughtonandH.Schildt-Java2(TheCompleteReference)-ThirdEdition TMH1999.
Books for Reference:	1.	V. C. Hamacher, G.Vranesic, S. G.Zaky-Computer Organisation, McGraw Hill.
	2.	J. P.Hayes,. Computer architecture, McGraw Hill, ISE, 1988
		3.H. K, Briggs. F.A - Computer Architecture and Parallel Processing, McGraw Hill ISE, 1988

SEMESTER IV**DATABASE MANAGEMENT SYSTEMS****SUB CODE:08UCACT4007, UCA/CT/4007****MAX MARKS:75****Course
outline**

Unit-1:	Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De normalization – Examples of Normalization.
Unit-2:	Oracle9i: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - SQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.
Unit-3:	Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions – Grouping Data. Multiple Tables: Join – Set operations.
Unit-4:	PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.
Unit-5:	PL/SQL Composite Data Types: Records – Tables – Varrays. Named Blocks: Procedures – Functions – Packages – Triggers – Data Dictionary Views.

Books for Study:	1.	Database Systems Using Oracle – Nilesh Shah, 2nd edition, PHI.
Books for Reference:	1.	Database Management Systems – ArunMajumdar&Pritimoy Bhattacharya, 2007, TMH.
	2.	Database Management Systems – Gerald V. Post, 3rd edition, TMH.

SEMESTER IV		
VISUAL PROGRAMMING		
SUB CODE: 08UACT4008 ,JCA/CT/4008		MAX MARKS:75
Course outline	Unit-1:	Customizing a Form-Writing Simple Programs-Toolbox-Creating Controls-ameProperty-CommandButton-AccessKeys-ImageControls-TextBoxes – Labels - MessageBoxes - Grid- EditingTools-Variables-DataTypes-String Numbers.
	Unit-2:	Displaying information-Determinate LOOPS-Indeterminate LOOPS-Conditionals- Select case-nested If then- goto. Built-in Functions- Functions and Procedures.
	Unit-3:	Lists-Arrays-Filter and Split functions-Sorting and Searching-Records Control Arrays-Combo Boxes- Flex GridControl- Projects with multiple forms-DoEvents and Sub Main-Error Trapping.
	Unit-4:	VB Objects-Dialog Boxes-Common Controls-Menus-MDI Forms- Testing, Debugging and Optimization.
	Unit-5:	Monitoring Mouse activity-File system Controls- FileSystem Objects - COM/OLE - automation-DLL Servers-OLE Drag and Drop-Database development using Visual Basic.

Books for Study:	1.	1. Gary Cornell-Visual Basic 6 from the Ground up-Tata McGraw Hill-1999.
Books for Reference:	1.	Noel Jerke-Visual Basic 6(The Complete Reference)-Tata McGraw Hill-1999.

SEMESTER IV

VB & SQL LAB

SUB CODE: 14UCACP4A07 ,UCA/CP/4A07

MAX MARKS:30

Exercises

PL/SQL block

1. Write a PL/SQL program to insert ten values in a table, check each value is odd or even and insert the output into the table
2. Use a cursor to select the five highest paid employees from the emp table.
3. Create a master and a transaction table. Write a PL/SQL code to update the master using transaction table.
4. Create a package, which consists of two procedures named hire_employee which will insert new employee details into emp table and another procedure named fire_employee which will delete an employee details from the database.
5. Write a PL/SQL block that will select all rows from a employee table. The block displays empno, empname, doj, dept, and experience column. Experience column should be calculated using current date and doj column.
6. Write a PL/SQL block to select only those rows where the ordered is 2000 from the item table and update the price to be three times the quantity and set the actual price column of the table to the value in price.

Procedures

1. Create a procedure to calculate simple interest. Principal, rate of interest and no. of years are given as input.
2. Create a procedure to satisfy the following conditions accepting the route id as user input. Create suitable table(s).
 - a. If the distance is less than 500 then update the fare to be 190.98
 - b. If the distance is between 501-1000 then update fare to be 876.98
 - c. If the distance is greater than 1000 then update fare to be 1200.98

Functions

1. Create a function that returns the empno of employees working in admin dept.
2. Create a function that finds out the result of a given student rollno.

Triggers

1. Write a database trigger before insert/update/delete for each row ant allowing any of the transactions on Mondays, Wednesdays and Fridays. Create suitable table(s)
 - a. The price of a product changes constantly. It is important to maintain the history of the prices of the products. Create a trigger to update the “Product_price_history” table when the price of the product is updated in the “Product” table. Create the “Product” table and “Product_price_history” table with the following fields respectivelyProduct_price_history (product_id number(5), product_name varchar2(32), supplier_name varchar2(32), unit_price number(7,2))
 - b. Product (product_id number(5), product_name varchar2(32), supplier_name varchar2(32), unit_price number(7,2))
2. Create the Price_history_trigger and execute it.
3. Update the price of a product. Once the update query is executed, the trigger fires and shoud updates the 'Product_price_history' table.

VB Applications

1. Write a program to convert Roman numerals to decimal.
2. Write a program to do money conversion. (conversion of rupees to various currencies)
3. Write a program to design a calculator with arithmetic, sqrt and trigonometric functions.
4. Write a program to perform temperature conversion and inches to feet conversion. The program should include facility to change font size, to display with precision (decimal places). The program should use MDI forms.
5. Write a program to select items from one list and move them to another list.
6. Write a program to implement the timer and shape controls.
7. Write a program to drag the controls within the form
8. Write a program to implement the slider control
9. Write a program to create a sketchpad using picture box.
10. Write a program to create a range tool using user controls.

For the following programs use Oracle, create a databaseandperformtheoperationsgivenbelow.

Use a Menu Driven program. Insertion, Deletion, Modification and Generate simple reports using queries. Payroll Electricity bill preparationsystem

SEMESTER IV

TALLY AND SPSS LAB

SUB CODE: 13UCACP4008, UCA/CP/4008

MAX MARKS:30

Computerized Accounting-Tally Accounting Software

SPSS - Statistical Package for Social Science

SEMESTER IV		
COST AND MANAGEMENT ACCOUNTING		
SUB CODE: 18UCAAT4CM4		MAX MARKS:75
Course outline	Unit-1:	Cost Accounting: Definition, meaning & objectives – Distinction between cost and financial accounting – Elements of cost and preparation of cost sheets.(Basic Cost Sheets)
	Unit-2:	Management accounting: Definition and Objectives – Distinction between management accounting and financial accounting
	Unit-3:	Fund flow– Importance of Fund flow– Schedule of changes in working capital – Preparation of Fund flow statement.
	Unit-4:	Preparation of Cash flow statement and its analysis.Difference between Fund flow and Cash flow
	Unit-5:	Marginal costing: The concept of Break-Even analysis , Ratio Analysis- Profitability Ratios – Gross Profit Ratio – Net Profit Ratio – Expense Ratio – Operating Ratio – Operating Profit Ratio – Turn Over Ratio – Inventory Turn Over Ratio – Debtors Turn Over Ratio – Creditors Turn Over Ratio – Fixed Assets Ratio – Working Capital Ratio (Simple Problems)

Books for Study:	1.	T.S. Reddy and A. Murthy - Cost and Management Accounting
Books for Reference:	1.	S.P. Jain & K.L Narang – Cost Accounting
	2.	S.N. Maheswari –Management Accounting

DEPARTMENT OF COMPUTER APPLICATIONS

FOURTH SEMESTER

NON MAJOR ELECTIVE FOR OTHER DEPARTMENTS (2 hrs/week)

SEMESTER IV		
Introduction to cyber Security		
SUB CODE: 18UCANE4002		MAX MARKS:50
Course outline	Unit-1:	Introduction to Cyber Crime - Classification of Cyber Crimes – Reasons for commission of Cyber Crimes.
	Unit-2:	Malware and Its Types - Kinds of Cyber Crimes.
	Unit-3:	Cyber Security Techniques - Firewall and its uses.

Reference	1.	http://uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf
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SEMESTER V		
PROGRAMMING IN JAVA		
SUB CODE: 13UACT5009 ,UCA/CT/5009		MAX MARKS:75
Course outline	Unit-1:	Introduction to Java-Features of Java-Object Oriented Concepts-Lexical Issues- data Types- Variables- Arrays-Operators-control Statements.
	Unit-2:	Classes –Objects-Constructors-Overloading method-Access Control- Static and fixed methods-Inner Classes-String Class-Inheritance- Overriding methods-Using super Abstract class.
	Unit-3:	Packages-Access Protection-Importing Packages-Interfaces-Exception Handling Throw and Throws-Thread-Synchronization-Messaging-Runnable Interface-Inter thread Communication-Deadlock- Suspending, Resuming and stopping threads-Multithreading.
	Unit-4:	I/OStreams-FileStreams-Applets-StringObjects-StringBuffer- CharArray-JavaUtilities-CodeDocumentation.
	Unit-5:	WorkingwithwindowsusingAWT Classes-AWTControls-LayoutManagersand Menus.

Books for Study:	1.	CayS.Horstmann,GaryCornell-coreJava2Volumel-Fundamentals,5 th Edition.PHI,2000.
	2.	P.NaughtonandH.Schildt-Java2(TheCompleteReference)-ThirdEdition TMH1999.
Books for Reference:	1.	Programming with Java, - A Primer – E.Baluguruswamy
	2.	Programming with Java 2 – Xavier, C
	3.	K.ArnoldandJ.Gosling-TheJavaProgrammingLanguage-SecondEdition AddisonWesley,1996.

SEMESTER V

PROGRAMMING IN PHP AND MYSQL

SUB CODE: 13UACT5010,UCA/CT/5010

MAX MARKS:75

Course outline	Unit-1:	Dynamic Content and the Web - PHP and MySQL's Place in Web Development - The components of a PHP Application - Integrating Many Sources of Information - Requesting Data from a Web Page. Developing Locally - working remotely.
	Unit-2:	Exploring PHP-PHP and HTML text - coding building blocks. PHP decision making-Expressions - Operator Concepts - Conditionals-Looping. Functions - calling functions - defining functions- Object-Oriented Programming. Arrays: Array fundamentals. Database basics: Data base design-Structured Query Language.
	Unit-3:	Using MySQL: MySQL Database - Managing the Database - Backing up and Restoring Data - Advanced SQL. Getting PHP to talk to MySQL: The process-querying the database with PHP functions - Using PEAR. Working with Forms: Building a form - Templates.
	Unit-4:	String functions-Date and time functions - File Manipulation – Calling System Calls - Modifying MySQL objects and PH data: Changing database objects from PHP - Manipulating table data- displaying results with Embedded links- presenting a form to add and process in one file - updating data – deleting data – performing a subquery
	Unit-5:	Cookies, Sessions and Access Control: Cookies - PHP and HTTP Authentication – sessions - using Auth_HTTP to Authenticate. Security: Session security. Validation and Error handling: Validating user input with JavaScript- Pattern Matching - Redisplaying a form after PHP validation fails. Building a Blog

Books for Study:	1.	Michele Davis, Jon Phillips-Learning PHP and MySQL-2006 edition, O'Reilly publication
Books for Reference:	1.	Ellie Quigley , Margo Gargenta- PHP and MySQL by examples
	2.	W.Jason Gilmore -Beginning PHP and MySQL from novice to professional- 3rd edition, Apress publisher
	3.	VikramVaswani – PHP programming solutions-2007 edition- Tata McGraw Hill Publication

SEMESTER V

OPERATING SYSTEMS

SUB CODE: 08UCACT5011,UCA/CT/5011

MAX MARKS:75

Course outline	Unit-1:	Introduction - System structures-operating system services-user operating system interface-system calls-system programs-Operating system design and implementation--operating –system structure-Virtual Machines–System Boot- Process Management-Process scheduling-operations on processes-Interprocess communication –Communication in client-server systems-Multithreaded programming-overview-multithreading models-thread libraries-Process scheduling-Basic concepts-scheduling criteria-scheduling algorithms-Multiple-Processor scheduling-Algorithm Evaluation
	Unit-2:	Process Synchronization: Critical-Section Problem-Synchronization Hardware- Semaphores-Classical Problems of Synchronization-Critical Region-Monitors. Deadlocks: Characterization- Methods for Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Recovery.
	Unit-3:	Memory Management: Address Binding-Dynamic Loading and Linking- Overlays-Logical and Physical Address Space-Contiguous Allocation- Internal & External Fragmentation. Non-Contiguous Allocation: Paging And Schemes- Implementation-Hardware-Protection-Sharing—Fragmentation- Segmentation
	Unit-4:	Virtual Memory: Demand Paging-Page Replacement-Page Replacement Algorithms-Thrashing. File System: File Concepts-Access Methods- Directory Structures-Protection Consistency Semantics-File System Structures – Allocation Methods-Free Space Management.
	Unit-5:	I/O System: Overview-I/O Hardware-Application I/O interface-Kernel I/O Subsystem-Transforming I/O Requests to Hardware Operations- Performance. Secondary Storage Structures: Protection-Goals-Domain- Access matrix-The Security Problem-Authentication-Threats-Threat Monitoring-Encryption.

Books for Study:	1.	A.SilberschatzP.B.Galvin,Gange., "Operating System Concepts",7 th Edn., John Wiley & Sons., 2002.
Books for Reference:	1.	A.SilberschatzP.B.Galvin,Gange., "Operating System Concepts",6 th Edn., JohnWiley& Sons., 2002.
	2.	H.M.Deitel,An Introduction to Operating System, Second Edition, Addison esley,1990

SEMESTER V

JAVA PROGRAMMING LAB

SUB CODE: 13UCACP5009,UCA/CP/5009

MAX MARKS:30

Exercises

Applications

1. Substring Removal from a String. Use String Buffer class.
2. Finding area and Perimeter of a circle. Use Buffered Reader class
3. Determining the order of numbers generated randomly using Random class.
4. Implementation of Point Class for Image manipulation.
5. String Manipulation using Char Array.
6. Usage of Vector Classes.
7. Implementing Thread based applications & Exception Handling.
8. Application using synchronization such as Thread based, Class based and synchronized statements.

Applets

1. Working with Frames and various controls.
2. Working with Dialogs and Menus.
3. Working with Panel and Layout.
4. Working with Colors and Fonts.

SEMESTER V

PHP AND MYSQL LAB

SUB CODE:13UCACP5010 , UCA/CP/5010

MAX MARKS:30

Exercises

1. Write a program in PHP to display date, month and year in a neat format.
1. Write a program in PHP to change background color based on day of the week using if else else if statements and using arrays
2. Write a program in PHP to force the text in a string to be all upper or lowercase
3. Write a program in PHP which writes the given number in words
4. Write a simple program in PHP for i) generating Prime number
ii) generate Fibonacci series
5. Write a simple program in PHP to manipulate array values.
6. Write a program in PHP for processing a simple form (use controls like checkbox, radio buttons and options).
7. Write a function in PHP to generate random password
8. Write a program for a simple and fast calendar combining PHP and tables.
9. Write a program in PHP for a simple POST and GET functions.
10. Write a program in PHP for setting and retrieving a cookie
11. Write a program in PHP for exception handling for i) divide by zero ii) checking date format
12. Write a program in PHP for random text link advertising using predefined arrays
13. Write a program in PHP for a simple email processing
14. Write a program for PHP for a login script

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| | <ol style="list-style-type: none">15. Write a program in PHP for counting lines, number of characters with space and without space from a file16. Write a program in PHP to upload file using form control.17. Write a program in PHP for storing, retrieving and deleting session data18. Write a program in PHP for admin interface to add and delete users using MySQL19. Write a program in PHP to add, update and delete using student database. |
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SEMESTER VI		
DATA COMMUNICATION AND NETWORKING.		
SUB CODE: 10UCACT6012,UCA/CT/6012		MAX MARKS:75
Course outline	Unit-1:	Introduction to data communication, network, protocols & standards organizations- line configuration- topology- transmission mode – classification of network – OSI model – layers of OSI model.
	Unit-2:	: Parallel and serial transmission –DTE/DCE/ such as EIA-499, EIA-530, EIA-202 and x21 interface- interface standards- modems – guided media – unguided media – performance – types of errors- error detection – error correction.
	Unit-3:	Multiplexing – types of multiplexing – multiplexing application – telephone system – project 802 – Ethernet – token bus – token ring – FDDI – IEE 802.6 – SMDS- circuit switching – packet switching – message switching – connection oriented and connectionless services.
	Unit-4:	History of analog and digital network – access to ISDN – ISDN layers – broadband ISDN – X.25 layers – packet layer protocol – ATM – ATM Topology – ATM protocol.
	Unit-5:	Repeaters – bridges - routers – gateway – routing algorithms – TCP/IP network, transport and application layers of TCP/IP – world wide web.

Books for Study:	1.	Behrouz and Forouzan – Introduction to Data Communication and Networking – 2 nd edition – TMH- 2001.
Books for Reference:	1.	Jean Warland – Communication Networks (A first course) – second edition – WCB/McGraw Hill – 1998.
	2.	Behrouz and Forouzan – Introduction to Data Communication and Networking – 3 rd edition – TMH- 2001.

SEMESTER VI		
WEB TECHNOLOGY		
SUB CODE: 13UACT6013, UCA/CT/6013		MAX MARKS:75
Course outline	Unit-1:	Introduction to HTML Tags – Introduction to XML – XML structure and syntax : Logical structure – XML syntax – Tags – Elements – Comments – Attributes – Cdata – Processing instructions – Entities – Well formed documents .
	Unit-2:	Validating XML with DTD : Introduction – Defining a DTD – Attribute Declaration – Entity declaration – Combining internal and external DTDs – Other DTD keywords – Client side validation – Server side validation – validating XML with schemas : Components of schemas – Using CSS with XML : XML versus HTML – Cascading style sheet – CSS and XML – Extensible style sheet language : Using XSL style sheet – XSL methods – XSL queries.
	Unit-3:	ASP.NET Language Structure-Page event, properties & compiler Directives HTML server controls-Anchor, Tables, Forms, Files, Basic Web server controls-Label, textbox, Button, Image, links, check & Radio Button, Hyperlink
	Unit-4:	Data List Web server controls-Checkbox list, Radio button list, Drop down list, Listbox, Data grid, Repeater. Other Web Server Controls: Calendar Control, AdRotator Control, Validation controls. Request and response objects, cookies.
	Unit-5:	Working with Data-OLEDB connection class, command class, transaction class, data adaptor class, data set class, Advanced issues-Email, Application issues, working with IIS and page Directives-Error handling. Security-Authentication, IP Address, secure by SSL & client certificates

Books for Study:	1.	Professional ASP XML ,Wrox Press Ltd. SPD Pvt. Ltd. ASP.NET Developers Guide, Greg Buczek
Books for Reference:	1.	T.A.Powell,complete Reference HTML(Third edition)TMH,2002
	2.	XML Complete Reference,ASP.net Complete Reference, Mc Donald, Mathew, TMH

SEMESTER VI

WEB TECHNOLOGY LAB

SUB CODE: 13UCACP6011, UCA/CP/6011

MAX MARKS:30

Exercises

HTML

- Put an existing image on a web page. Create a table, use a heading and at least one use of rowspan/colspan. Colour a page and some text within the page. Link to another site.
- 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 horizontal rule.
- A link to your email addresses (with your name between the tag); remember to put the link to your email address within address tags.
- A line break.
- The date. (I have this same structure at the bottom of this page).
- Above this block (which is called the footer), put a title in heading tags.
- Add some text describing you. (You can split this into multiple headings and paragraphs if you wish).

XML

1. Creation of XML documents.
2. Validation of XML using DTD
3. Validation of XML using schemas
4. Using CSS in XML
5. Creating XSL style sheets.

Exercises

ASP.NET

1. Create a web form for online quiz. The score earned by the user should be displayed back.
2. Create a web form for an online library. This form must be able to accept the membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the books are to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls.
3. Create a web form for an online library. This form must be able to accept the membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the books are to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls. Display an advertisement at the bottom of the web form that you created.
4. Create an array containing the titles of five new movies .use this array as a data source for a drop down list control. The page must be capable of displaying the selected movies title to the user when the user clicks on the submit button.
5. Create a web application to generate employee payroll report. The form accepts the employee Id, employee name, basic pay. On submitting the form the allowances and deductions are calculated and display the respective report. Use proper validation controls.
6. Use a calendar control in the page to determine the current date (when the book is borrowed) and calculate the due date, which must be one week from the current date. Display the due date to the user.
7. Create a virtual directory in IIS. Create a global file and include the "session _Start" and "session _End" and, "Application _Begin Request" and application End request" events. Write a simple ASP.NET page and execute it in the browser.

SEMESTER VI

MINI PROJECT

SUB CODE: 13UCAPR6001 ,UCA/PR/6001

MAX MARKS:30

Group Projects

Project Evaluation:

Power point presentation of the project and individual viva

SEMESTER V		
ELECTIVE - I		
RESOURCE MANAGEMENT TECHNIQUE		
SUB CODE: 13UCACE5A01,UCA/CE/5A01		MAX MARKS:75
Course outline	Unit-1:	Basic of Operations Research (OR): Characteristics of O.R- Necessity of O.R in industry-OR and Decision making-Role of computers in O.R. Linear programming: Formulation and Graphical solution (of 2 variables) canonical and standard terms of Linear programming problem. Algebraic solution and Graphical solution: Simplex method
	Unit-2:	Transportation model: Definition-formulation and solution of transportation models – the row- minima, column-minima, matrix minima and vogel’s approximation methods. Assignment model: Definition of assignment model-comparison with transportation model-formulation and solution of Assignment model-variation of Assignment problem.
	Unit-3:	Sequencing problem: Processing each of n jobs through m machines-processing n jobs through 2 machines-processing n jobs through 3 machines – processing 2 jobs through m machines-processing n jobs through m machines – traveling salesman problem.
	Unit 4:	Game Theory: Characteristic of games – maximin,minimax criteria of optimality – Dominance property – algebraic and graphical method of solution of solving 2*2 games.
	Unit-5:	Pert-CPM: Networks-PERT computation-CPM computation – resource scheduling.

Books for Study:	1.	Operations Research -Resource Management Technique, P.R.Vittal,V.Malini ,Margham Publication.
	2.	Srinath L.S.: PERT and CPM principles and applications, Affiliated East Press Pvt. Ltd., New York, 1973.
Books for Reference:	1.	HamdyA.Taha: Operation Research – An Introduction, 5thed. Prentice Hall of India, Private Limited.,New Delhi,1996.

SEMESTER VI		
ELECTIVE - II		
SOFTWARE ENGINEERING AND TESTING		
SUB CODE:13UCACE6A02, UCA/CE/6A02		MAX MARKS:75
Course outline	Unit-1:	Introduction to Software Engineering: The Software process: A generic view of process-Software Engineering –Layered technology, Process framework, CMMI ,Process patterns , Process assessment , Personal and Team process models ,Process technology, Product and Process.
	Unit-2:	Process models: Waterfall model, Incremental Model, Evolutionary process models, Specialized Process models, Unified process.System engineering – computer based systems, System Engineering hierarchy, business process engineering,Product engineering, system modeling.
	Unit-3:	Requirements Engineering- Bridge to design and construction. Requirements Engineering tasks,Initiating the requirements engineering process,Eliciting Requirements, Developing Use-cases,Building the analysis model,Negotiating Requirements and Validating Requirements.
	Unit-4:	Principles of Testing - White Box Testing- Black Box testing
	Unit-5:	Integration Testing -System and Acceptance Testing

Books for Study:	1.	Roger .S. Pressman ,Software Engineering – A Practitioner’s Approach : McGraw – Hill International Edition , Sixth Edition.
	2.	Software Testing Principles and Practices, Srinivasan Desikan& Ramesh Gopalswamy,Pearson Education

Books for Reference:	1.	Ian Sommerville, Software Engineering-Pearson Education, Asia -3rd Edition
	2.	K.K. Aggarwal & Yogesh Singh, Software Engineering, New Age International publishers.
	3.	Software Engineering-Richard Fairely
	4	Software Testing Technique-Beizer Boris, Dreamtech

ELECTIVE		
CLOUD COMPUTING		
SUB CODE:		MAX MARKS:75
Course outline	Unit-1:	Understanding Cloud Computing: Beyond the Desktop: An Introduction to Cloud Computing – Are you ready for Computing the Cloud – Developing Cloud Services.
	Unit-2:	Cloud Computing for Everyone: Cloud Computing for the Family – Cloud Computing for the Community– Collaborating on Group Projects and Events – Cloud Computing for the Corporation.
	Unit-3:	Using Cloud Services: Collaborating on Calendars, Schedules and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management.
	Unit-4:	Collaborating on Word Processing - Collaborating on Spreadsheets - Collaborating on Databases - Collaborating on Presentations – Storing and Sharing Files and other Online Content – Sharing Digital Photographs – Controlling it all with Web-Based Desktops.
	Unit-5:	Outside the Cloud: Other Ways to Collaborate Online: Collaborating via Web-Based Communication Tools - Collaborating via Social Networks and Groupware - Collaborating via Blogs and Wikis.

Books for Study:	1.	“Cloud Computing” Michael Miller, Pearson publication, 2013
Books for Reference:	1.	“Cloud Computing” , Dr.Kumar Saurabh ,Wiley India ,2011

ELECTIVE		
E-COMMERCE		
SUB CODE:		MAX MARKS:75
Course outline	Unit-1:	Electronic Commerce and Opportunities: Background The Electronic Commerce Environment – Electronic Marketplace Technologies – Modes of Electronic Commerce: Overview: Electronic Data Interchange.
	Unit-2:	Approaches to Safe Electronic Commerce. Overview – Secure Transport Protocols – Secure Transaction – Secure Electronic Payment Protocol (SEPP) – Secure Electronic Transaction (SET)
	Unit-3:	Certificates for Authentication – Security on Web Servers – Payment Schemes: Internet Monetary Payment and Security Requirements- Payment and purchase order process – Online electronic cash.
	Unit-4:	Internet / Intranet Security Issues and Solutions : The Need for Computer Security – Specific Intruder Approaches – Security Strategies-Security Tools – Encryption – Enterprise Networking and Access to the Internet Antivirus Programs.- Security Teams.
	Unit-5:	MasterCard/Visa Secure Electronic Transaction: Introduction –Business Requirements – Concepts – payment Processing.

Books for Study:	1.	Daniel Minoli& Emma Minoli, “Web Commerce Technology Handbook”, Tata McGraw Hill – 1999.
Books for Reference:	1.	“E-Commerce” ,K.Bajaj& D Nag , Tata McGraw Hill – 1999.
	2.	“E-Commerce” , MamtaBhusry

ELECTIVE		
SECURITY IN INFORMATION TECHNOLOGY		
SUB CODE:		MAX MARKS:75
Course outline	Unit-1:	Information Security – Introduction of information security – History, critical characteristic of Information, NSTISSC Security model, Components of an information system, securing components. The need for security – Introduction, Business needs, Treats, Attacks, Malicious code, Hoaxes, Back doors, Password crack, Brute force, Dictionary, DoS, Spoofing, Man-in-the-middle, Spam, Mail Bombing, Sniffers, Social Engineering, Buffer Overflow, Timing Attack.
	Unit-2:	Risk Management – Introduction, overview of risk management, risk identification, risk assessment, risk control strategies, selecting a risk control strategy. Security Policies – Introduction, information security policy, standards and practices, information security blueprint, continuity strategies, introduction to ISO27000 series.
	Unit-3:	Firewall and VPNs - Introduction, Physical design, Firewalls, protecting remote connections. Intrusion Detection, Access control and other tools – Introduction, IDSs, Honey nets and Padded cell systems, Scanning and Analysis tools, Access control devices.
	Unit-4:	Cryptography – Introduction, Principles of Cryptography, Cryptography tools, Public key infrastructure, Digital certificates, Hybrid cryptography systems, Steganography, protocols for secure communication.
	Unit-5:	Information Security Maintenance – Introduction, security management models, maintenance model.
Books for Study	1.	Michael E. Whitman and Herbert J. Mattord , Principles of Information Security, 4 th Edition, Thomson Course Technology, Boston.
Books for Reference	1.	Daswani Neil, Christopher Kern and Anita Kesavan , (2007), Foundations of Security – What every programmer needs to know, Apress, Berkeley CA.

ELECTIVE

COMPUTER GRAPHICS

SUB CODE:

MAX MARKS:75

Course outline	Unit-1:	Introduction to computer graphics: Brief Survey of Computer Graphics – Graphics Systems: Video Display Devices – Types – Raster-Scan Systems and Random-Scan Systems – Input Devices – Hard-Copy Devices – Graphics Software.
	Unit-2:	Output primitives and their attributes Line-Drawing (DDA and Bresenham's) Algorithms – Circle-Generating (Midpoint) Algorithm – Ellipse-Generating (Midpoint) Algorithms- Area-Filling (Boundary-Fill and Flood-Fill) Algorithms - Line Attributes - Color and Grayscale Levels – Character Attributes.
	Unit-3:	Two-dimensional transformations and viewing : Basic Transformations - Matrix Representations and Homogeneous Coordinates – Composite Transformations - Other Transformations – Window-to- Viewport Coordinate Transformation.
	Unit-4:	Three-dimensional concepts: Three-Dimensional Display Methods: Parallel and Perspective Projections – Depth Cueing - Visible Line and Surface Identification – Three-Dimensional Transformations: Translation- Rotation-Scaling - Other Transformations.
	Unit-5:	Three-dimensional viewing: Viewing Pipeline and Coordinates – Transformation from World to Viewing Coordinates – Projections – Parallel Projection- Perspective Projection.

Books for Study:	1.	D. Hearn and M.P. Baker,2005,Computer Graphics, 2ndEdition, Pearson Education, Prentice Hall, 19th Reprint.
Books for Reference:	1.	S. Harrington,1987, Computer Graphics , 2nd Edition , Tata McGraw-Hill Book Co.
	2.	W.M. Newman and R.F. Sproull ,1997, Principles of Interactive Computer Graphics, 2nd Edition, Tata McGraw-Hill Publishing Co. Ltd.
	3.	D.P. Mukherjee, 1999,Fundamentals of Computer Graphics and Multimedia , 1 st Edition, Prentice-Hall of India Pvt. Ltd.

SEMESTER VI		
ELECTIVE-III		
DATA MINING		
SUB CODE: 18UCACE6C03 ,UCA/CE/6C03		MAX MARKS:75
Course outline	Unit-1:	Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases - Mining Issues – Metrics – Social implications of Data mining. Data Mining Techniques – Introduction – A statistical perspective on Data Mining – similarity measures – Decision Trees – Neural Networks – Genetic Algorithms
	Unit-2:	Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization .
	Unit-3:	Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining
	Unit-4:	Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy
	Unit-5:	Clustering Techniques: cluster Analysis – Clustering Methods – Similarity and Distance Measures – Hierarchical Methods - Partitional Methods – Outlier Analysis

Books for Study:	1.	Han and M. Kamber , 2001, “ <i>Data Mining: Concepts and Techniques</i> ”, Morgan Kaufmann, .New Delhi.
Books for Reference:	1.	M. H.Dunham, 2003, “ <i>Data Mining : Introductory and Advanced Topics</i> ” , Pearson Education, Delhi.
	2	PaulrajPonnaiah, 2001,“ <i>Data Warehousing Fundamentals</i> “, Wiley Publishers.S.N. Sivananda and S. Sumathi, 2006, Data Mining, Thomsan Learning, Chennai
e-References	1	http://nptel.iitm.ac.in/video.php?subjectId=106106093 http://cecs.louisville.edu/datamining/PDF/0471228524.pdf