

VIVEKANANDHA

COLLEGE OF ARTS AND SCIENCES FOR WOMEN

ELAYAMPALAYAM, TIRUCHENGODE (Tk.), NAMAKKAL (Dt.).

(An ISO 9001 : 2008 Institutions Affiliated to Periyar University,

Approved by AICTE & Re-accredited with 'A' Grade by NAAC)

Recognized under section 2(f) & 12(b) of UGC Act, 1956



DEPARTMENT OF COMPUTER APPLICATIONS

BCA

SYLLABUS & REGULATIONS

**FOR CANDIDATES ADMITTED FROM 2014 - 15
ONWARDS UNDER AUTONOMOUS & CBCS PATTERN**

**VIVEKANANDHA EDUCATIONAL INSTITUTIONS
Angammal Educational Trust
Elayampalayam, Tiruchengode (Tk.), Namakkal (Dt.)**

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BCA

I. SCOPE OF THE PROGRAMME

The IT boom and the rapid growth in science and technology have opened up new vistas of job opportunities. The college offers Bachelor of Computer Applications which seeks to equip the learners to meet the spiraling demand of the IT industry. It provides special training in computer application of software's. The syllabus has been designed at a level equal to that of professional courses. Focus is also on developing soft skills of the students.

II. SALIENT FEATURES

- Qualified and Experienced team of faculty members with varied experience in areas of System Software, Computer Architecture, Artificial Intelligence, Mobile and Computer Networks, Graphics and Image Processing and Database Management System
- Motivating of students enhanced with immense expertise, massive technical exposure & structured creative initiatives.
- Industrial visits to various renowned companies are arranged to give an exposure to the students.
- Students are taught by using Audio Visual aids like OHP's & LCD Projectors and modern E-learning
- Course is specially designed for a higher level Career Placement.
- Project work is included in the syllabus to enhance conceptual, analytical & deductive skills.

III. OBJECTIVES OF THE PROGRAMME

- To produce a highly qualified professionals impart of both theoretical and practical knowledge in computer systems and its application.
- To produce fully skilled and trained manpower capable of solving the software & hardware problems, and discovering software solutions related to business organizations.
- To provide an in-depth knowledge of specific sub-disciplines chosen by the students as areas of special interest in the form of elective courses.

- The BCA Program is aimed at providing a platform to the students to enhance their skills in various fields of Computer Science & Information Technology like Hardware, Software development, Networking, Database Management & IT enabled services and to facilitate students to interact with IT professionals, Industry Partners & Academicians from IT and related areas.
- The courses is designed to develop computer professionals versatile is use of computers in almost all field of computer application .The main emphasis of the course is an applied computer use in various fields.

IV. ELIGIBILITY FOR ADMISSION

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic stream or Vocational stream) as one of the subject under Higher Secondary Board of Examination, Tamilnadu as per norms set by the Government of Tamilnadu or an Examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the Bachelor of Computer Application degree examination after a course of study of three academic years.

V. DURATION OF THE PROGRAMME

- The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to March.
- The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University, Salem.
- Each subject will have four to six hours of lecture per week apart from practical training at the end of each semester.

VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously and the Internal Assessment

Marks **for theory papers** will be as under:

1. Average of Two Tests	- 10 Marks
2. Seminar	- 5 Marks
3. Assignment	- 5 Marks
4. Attendance	- 5 Marks

Total	- 40 Marks
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Assessment Marks **for practical papers** will be as under:

1. Model Exam	- 20 Marks
2. Observation Note	- 10 Marks
3. Attendance	- 10 Marks

Total	- 40 Marks
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PASSING MINIMUM (Theory)

EXTERNAL:

In the University Examinations, the passing minimum shall be 40 % out of 75 Marks. (30 Marks)

PASSING MINIMUM (Practical / Mini project)

EXTERNAL:

In the University Examinations, the passing minimum shall be 40 % out of 60 Marks.

(24 Marks)

VII. ELIGIBILITY FOR EXAMINATION

A candidate will be permitted to appear for the University Examination only on learning 75 % of attendance and only when her conduct has been satisfactory. It shall be open to grant exemption to a candidate for valid reasons subject to conditions prescribed.

Distribution of marks for Attendance:

Percentage	Marks	
	Theory	Practical
75-80	1	2
81-85	2	4
86-90	3	6
91-95	4	8
96-100	5	10

VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (main and allied subjects) & securing marks.

- a) 75 % and above shall be declared to have passed the examination in first class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.
- b) 60% and above but below 75 % shall be declared to have passed the examinations in first class without Distinction.
- c) 50% & above but below 60% shall be declared to have passed the examinations in second class.
- d) All the remaining successful candidates shall be declared to have passed the examinations in third class.
- e) Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of three consecutive academic years from the year of admission only will be eligible for University rank.

IX. ELIGIBILITY FOR AWARD OF THE DEGREE

A candidate shall be eligible for the award of the degree only if she has undergone the above degree for a period of not less than three academic years comprising of six semesters and passed the examinations prescribed and fulfilled such conditions has have been prescribed therefore.

X. PROCEDURE IN THE EVENT OF FAILURE

If a candidate fails in a particular subject, she may reappear for the university examination in the concerned subject in subsequent semesters and shall pass the examination.

XI. COMMENCEMENT OF THESE REGULATIONS

These regulations shall take effect from the academic year 2011-12 (i.e.,) for the students who are to be admitted to the first year of the course during the academic year 2011-12 and thereafter.

EVALUATION OF EXTERNAL EXAMINATIONS (EE)

QUESTION PAPER PATTERN – Theory

Time duration: 3 Hours

Max. Marks: 75

PART- A: 10 x 2= 20

Answer all the questions

Two Questions from each unit

PART- B: 5 x 5 = 25

Answer all the questions

One Question from each unit (either or type)

PART- B: 3 x 10 = 30

Answer all the questions

One Question from each unit (3 Out of 5)

The Passing minimum shall be 40% out of 75 Marks (30 Marks)

EVALUATION OF EXTERNAL EXAMINATIONS (EE)
QUESTION PAPER PATTERN – Practical

Time Duration: 3 Hours

Max. Marks: 60

1. One compulsory question from the given list of objectives : 30
Marks
2. One either/or type question from the given list of objectives : 30
Marks

The Passing minimum shall be 50% out of 60 Marks (30 Marks)

BCA Curriculum for Academic year 2014 – 15

SEM	PART	COURSE CODE	TITLE	HOURS	CREDIT	MARKS		
						CIA	EE	TOTAL
I	I	14U1LT01	Tamil - I	6	3	25	75	100
	II	14U1LE01	English - I	6	3	25	75	100
	IV	15U1CAC01	Core - I Digital Computer Architecture and C Programming	6	4	25	75	100
	IV	14U1CACP01	Practical - I Programming in C Lab	5	4	40	60	100
	III	14U1MAA03	Allied – I – Paper - I Numerical Methods	5	3	25	75	100
		14U2VE01	Value Education	2	1	25	75	100
	Total				30	18	165	435
II	I	14U2LT02	Tamil - II	5	3	25	75	100
	II	14U2LE02	English - II	6	3	25	75	100
	IV	14U2CAC02	Core - II Object Oriented Programming with C++	6	4	25	75	100
	IV	14U2CACP02	Practical - II Programming in C++ Lab	4	4	40	60	100
	III	14U2MAA07	Allied -I Paper - II Discrete Mathematics	5	3	25	75	100
	VII	14U2CAS01	SBEC - I Microsoft Office & Tally	2	2	25	75	100
		14U1ES01	Environmental studies	2	1	25	75	100
Total				30	20	190	510	700
III	IV	14U3CAC03	Core - III Data Structures and Algorithms	6	5	25	75	100
	IV	14U3CAC04	Core – IV Visual Programming	6	4	25	75	100
	IV	14U3CAC05	Core - V Operating Systems	6	4	25	75	100
	IV	14U3CACP03	Practical - III Visual Programming Lab	5	4	40	60	100
	III	14U3CMA03	Allied-II-Paper -I Financial Accounting	5	3	25	75	100
	VI	14U3MAN01	NMEC – I	2	2	25	75	100
Total				30	22	165	435	600
IV	IV	14U4CAC06	Core-VI Software Engineering	5	5	25	75	100
	IV	14U4CAC07	Core - VII Relational Data Base Management System	5	5	25	75	100
	IV	14U4CAC08	Core –VIII Client Server Computing	5	4	25	75	100
	IV	14U4CACP04	Practical -IV RDBMS Lab	5	3	40	60	100
	III	14U4CMA04	Allied - II - Paper -II Cost and Management Accounting	5	3	25	75	100
	VII	14U4CAS02	SBEC -II DTP Package	3	2	25	75	100
	VI	14U4MAN02	NMEC – II	2	2	25	75	100
Total				30	24	190	510	700
V	IV	14U5CAC09	Core - IX Programming in ASP . NET	5	5	25	75	100
	IV	14U5CAC10	Core - X Programming in JAVA	5	5	25	75	100
	V	14U5CAE__	Elective – I	5	5	25	75	100
	IV	14U5CACP05	Practical –V ASP. Net Programming Lab	5	5	40	60	100
	IV	14U5CACP06	Practical -VI Java Programming Lab	4	4	40	60	100
	VII	14U5CAS03	SBEC -III Open Source Technologies	3	2	25	75	100
	VII	14U5CAS04	SBEC -IV Soft Skills	3	2	25	75	100
Total				30	28	205	495	700
VI	IV	14U6CAC11	Core – XI Computer Graphics	5	5	25	75	100
	V	14U6CAE__	Elective –II	5	5	25	75	100
	V	14U6CAE__	Elective – III	5	5	25	75	100
	V	14U6CAP07	Practical – VII: Computer Graphics Lab.	5	5	40	60	100
	IV	14U6CACPR01	Practical -VIII Project Work (House Project)	4	3	40	60	100
	VII	14U6CAS05	SBEC -V JAVA Script	3	2	25	75	100
	VII	14U6CAS06	SBEC -VI CoreIDRAW	3	2	25	75	100
		14U1EX01	Extension Activities	-	1	-	-	-
Total				30	28	190	510	700
Core Total				180	140	1105	2895	4000

Elective I

Semester	Course Code	Title
V	14U5CAE01	Mobile Computing
	14U5CAE02	Software Testing
	14U5CAE03	Computer Networks

Elective II

Semester	Course Code	Title
VI	14U6CAE04	Ecommerce
	14U6CAE05	Cloud Computing
	14U6CAE06	PC Hardware And Trouble Shooting

Elective III

Semester	Course Code	Title
VI	14U6CAE07	Object Oriented Analysis And Design
	14U6CAE08	Data mining & Data Warehousing
	14U6CAE09	Compiler Design.

SEMESTER I

Semester	I	Core Course- Digital Computer Architecture and C Programming	Credit	4
Code	15U1CAC01		Hours	5

Objectives:

Part – I of this course provides fundamentals of digital electronics which includes concepts of number system, Boolean algebra, logic gates, and logical design of sequential and combinational circuits.

Part – II of this course provides the syntax and structure of C programming Language and the students will learn the programming skills using C language

UNIT – I**Hours: 10**

Introduction: Organization and Architecture – Structure and Function. Computer Evolution and Performance: Brief history of Computer.

Number System : Decimal – Binary – Octal –Hexadecimal Number system – Conversion – Binary Addition – Binary Subtraction – Complements – BCD – ASCII Code – EBCDIC Code. Boolean Algebra & Gate network: AND – OR Gates – Inverters – NAND – NOR Gates – Basic laws of Boolean algebra – Demorgan’s Theorem.

UNIT – II**Hours: 10**

Overview of C: Introduction – Basic structure of C programs – Character set – C Tokens – Keywords & Identifiers – Constant – Variables – Data types – Assigning values to variables – Defining symbolic constant – Operators & expressions – Type conversions.

UNIT – III**Hours: 08**

Managing Input & Output Operations. Decision Making & Branching Statements: IF – IF-else – Nesting of IF-else – Switch – GOTO Statement. Looping Statement: While – Do..While statement – For statement.

UNIT – IV**Hours: 10**

Arrays: Definition & Declaration – Types of arrays – Declaring & Initializing string variables – String handling functions. User defined function: Introduction – Definition of function – Function calls – Function declarations & Return types – Recursion. Structures & Unions: Defining a structure – Declaring structure variables – Accessing structure members – structure Initialization. Unions.

UNIT – V**Hours: 12**

Pointers: Introduction – Understanding pointers – Accessing the address of a variable – Initializing of pointer variables. File Management: Introduction - Defining & Opening a file – Closing a file – Input / Output Operation on files.

Text Books:

1. William Stalling, “Computer Organization & Architecture Designing for performance” 7th Ed, Pearson Education, New Delhi, 2010 (Unit – I)
2. Thomas C Bartee, “Digital Computer Fundamentals” 6th Edition. T.M.H Publisher, New Delhi, 1991 (Unit I: Chapters 2 & 3)
3. “Programming in ANSI C , E. Balagurusamy TMG Hill, New Delhi, 4th Ed. (Unit II to V: Chapters 1, 2, 3 & 4, 5, 6, 7, 8, 9, 10, 11 & 12)

Semester	I	Programming In C Lab	Credit	4
Code	14U1CACP01		Hours	5

1. Program to find the Factorial of N Numbers.
2. Program to find the Fibonacci series of N numbers.
3. Program to find the solution for the Quadratic Equation (All Cases)
4. Program to Sort and find the largest and smallest of the given array of numbers.
5. Program to implement Matrix Manipulation.
6. Program to check whether the given string is Palindrome or not.
7. Program to implement string handling functions.
8. Program to find the number of characters, words and lines in a given string.
9. Sorting the given names in ascending and descending order.
10. Program to Swap two numbers using functions.
11. Program to prepare Student Mark list using structure.
12. Program to prepare Pay Bill using files.

Semester	I	Numerical Methods	Credit	3
Code	14U1MAA03		Hours	5

Total Hours: 50

(For B.C.A Students admitted from the year 2014-15 onwards)

Unit I **9 Hrs**

Solution of algebraic and transcendental Equations –Bisection method-Iteration method – Method of false position –Newton Raphson method – Problems.

Unit II **11 Hrs**

Interpolation with equal intervals –Newton’s forward and Backward Interpolation formula – Central Difference Interpolation formula –Gauss’s forward and Backward Interpolation formula.

Unit III **10 Hrs**

Numerical Differentiation – Derivatives using Newton’s Forward - Newton’s Backward – Striling’s Formula.

Unit IV **11 Hrs**

Numerical Integration – Trapezoidal rule – Simpson’s one – third rule – Simpson’s three – eighth rule – Boole’s rule – weddle’s rule – Problems.

Unit V **9 Hrs**

Solution of linear simultaneous equations – Direct method – Matrix inversion method – Gauss elimination method – Gauss - Jordan method – Jacobi’s iteration method – Gauss – Seidal iteration - Problems.

Text book

Numerical methods by P. Kandasamy, K.Thilagavathy, K.Gunavathi (Third Edition)
Publication – S.Chand & company Ltd, New Delhi.

Reference book:

1. Numerical Methods by A. Singaravelu , Publication -Meenakshi company Chennai.
2. Introductory Methods of Numerical Analysis – 4th Edition. S.S. Sastry – Prentice – Hall of India Pvt Ltd , New Delhi

SEMESTER II

Semester	II	Core Course- VIII Object Oriented Programming with C++	Credit	4
Code	14U2CAC02		Hours	5

Total Hours: 50

Objectives:

To learn the basic concepts of object oriented programming & the syntax of C++ language. To impart the programming skills C++ and the concepts of OO Software Development Life Cycle and about Unified Modeling Language.

UNIT I

12Hrs

Basic Concepts of OOP – Benefits of OOP – Applications of OOP -Structure of C++ - Applications of C++ -Tokens- Keywords- Identifiers and Constant-Data types - Variables – Operators-Manipulators-Expressions- Control Structures. Functions – Prototype- Call by Reference- Return by reference- Inline Functions- Default Arguments- const Arguments- Function Overloading- Friend and Virtual Function.

UNIT - II

12 Hrs

Classes and Objects – Class – Member Functions-Array with in a class- Memory Allocation for Objects- Static data members – Static member function- Array of Objects- Objects as Function Arguments – Friendly Functions-Returning Objects-const Member Functions- Pointers to Members, Constructors and Destructors. Operator Overloading and type conversions.

UNIT III

12 Hrs

Inheritance: Extending classes- Derived Classes- single inheritance- Multilevel Inheritance- Multiple Inheritance- Hierarchical Inheritance- Hybrid Inheritance- Virtual Base Classes- Abstract Classes, Pointers, virtual Functions and Polymorphism: Pointers – Pointers to Objects – these Pointers Virtual Functions – Pure Virtual Functions. Managing I/O Operations: Streams in C++ - C++ Stream Classes – Formatted and Unformatted I/O Operations Managing Output with Manipulators.

UNIT IV

12 Hrs

Working with Files: Classes for file Stream Operations- Opening and closing a File – Detecting end-of-file- File Pointers and their Manipulators – sequential I/O Operations- Updating a file- Error Handling during File Operations- Command Line Arguments- Templates: Class templates- Class templates with Multiple Parameters- Function templates- Function Templates with Multiple Parameters- overloading of Templates Functions- Member Function Templates- Non- type template arguments, Exception Handling: Basics- Exception Handling Mechanism- throwing Mechanism- Catching Mechanism- Rethrowing an Exception – Specifying Exceptions.

UNIT V

12 Hrs

Object - Oriented System Development Life Cycle. : Introduction – The software development process – Building High – Quality software – Object – Oriented System Development – Reusability. Unified Modeling Language: Introduction – Static and Dynamic models – UML Diagrams – UML class Diagram – Use – case Diagram – UML dynamic modeling – UML Extensibility – UML Meta Model.

Text Book:

1. E.Balagurusamy, "*Object-Oriented Programming with C++*", Tata McGraw Hill Publishing Company Limited, New Delhi ,Second Edition, 2001. UNIT-I(CHAPTER 1, 2, 3, 4) UNIT-II (CHAPTER - 5, 6, 7) UNIT-III (CHAPTER - 8, 9, 10) UNIT – IV (CHAPTER - 11, 12, 13).
2. Bahrami "*Object Oriented Systems*", McGraw Hill International Edition, 1999. UNIT-V (CHAPTER 3, 5)

Books for Reference:

1. Robert Lafore, "*Object Oriented Programming in Turbo C++*", Galgotia ,2001.
2. Herbert Schildt, "*Teach Yourself C++*", Third Edition. Tata McGraw Hill, 5th Reprint, 2000
3. K.R Venu Gopal , Rajkumar, T.Ravishankar, "*Mastering C++*",Tata McGraw Hill Publishing Company Ltd, New Delhi

Semester	II	Practical - II C++ Lab	Credit	3
Code	14U2CACP02		Hours	4

Total Hours: 50

Objectives:

To have practical understanding in programming in C++

Practical List:

1. Programs using Classes and Objects.
2. Constructors & Destructors.
3. Array of objects, Passing objects as Function arguments.
4. Inline Functions
5. Function overloading
6. Operator overloading
7. Inheritance (All Types)
8. Dynamic Polymorphism – Virtual Functions.
9. Formatted I/O and File Operation.
10. Templates
11. Exception Handling
12. Friend Function

Semester	II	Discrete Mathematics	Credit	3
Code	14U2MAA07		Hours	5

Total Hours: 50

(For B.Sc (CS) & B.C.A Students admitted from the year 2014-15 onwards)

UNIT I : **10 Hrs**

Mathematical Logic – Statements and Notations – Connectives – Negation – conjunction – Disjunction – Statement Formulas and Truth Table – Conditional and Biconditional – Well formed Formulas – Tautologies.

UNIT II : **8 Hrs**

Normal Forms – Disjunctive Normal Forms – Conjunctive Normal Forms – Principal Disjunctive Normal Forms – Principal Conjunctive Normal Forms– The Theory of Inference for the Statement Calculus – Validity using Truth tables – Rules of Inference – Consistency of premises and indirect method of proof.

UNIT III : **11 Hrs**

Relations & ordering – Relations – Properties of binary relation in a set – Functions – Definition & Introduction – Composition of Functions – Inverse function – Binary and n – array operations – Hashing Functions – Natural numbers – Peano Axioms & Mathematical Induction – Cardinality.

UNIT IV : **11 Hrs**

Lattices as partially ordered Sets- Defintion and Examples – some properties of Lattices – Lattices as Algebraic systems – sub Lattices – Direct product and homomorphism.

UNIT V : **10 Hrs**

Boolean Algebra- Defintion and Examples – subalgebra, Direct product and homomorphism – Boolean Functions – Boolean Forms and Free Boolean Algebras – Values of Boolean Expression and Boolean Functions.

Text book:

1. Discrete Mathematical structures with application to computer science by J.P. Trembly, R.Manohar. Publishing Company Tata Mc Graw Hill, NewDelhi 2001.

Reference Books:

1. Discrete Mathematics by Prof.V. Sundaresan, K.S. Ganapathy Subramaniyan, K. Ganesan Publishing Company Tata Mc Graw Hill, NewDelhi 2001.
2. Discrete Mathematics by Lovarz,J. Pelikan, K. Vexztergombi Publishing company Springer International Edition 2002.

Semester	II	SBEC – I Microsoft Office and Tally	Credit	2
Code	14U2CAS01		Hours	2

Objectives:

To provide a hands on experience in the office automation packages.

UNIT- I**Hours: 05**

Introduction to Computer-Introduction to Windows. MS-WORD: Introduction to Word processing – Commands used in Word document- Copying and Moving Text - Working with Text - Find and Replace - Formatting Text - Mail Merge –Table - Spell Check and Grammar.

UNIT-II**Hours: 05**

MS-EXCEL: Introduction – Advantages – Features – Opening Excel – Components – Entering and Editing Data – Hide and Unhide-Insertion and Deletion- Naming Formulas – Functions – Functions Practice – Shortcut Keys.

UNIT-III**Hours: 05**

MS-POWER POINT: Introduction – Terminologies – Views – Templates – Creating and Editing Slides – Formatting text – Change the way Text looks – Insert a Symbol or special Character – cancel or Undo an action – Move or Copy text by dragging – Collect and Paste multiple items – Clear all items in the clipboard – Change a colour – scheme a Colour – Auto-Shapes – Text art – Clipart gallery - Colour schemes – Chart.

UNIT-IV**Hours: 05**

MS-ACCESS: Introduction – Starting Microsoft Access – Creating New Database – Opening Existing Database – Access database Wizards – Tables – Creating Query - Creating Queries from search.

UNIT-V**Hours: 05**

Introduction to Tally – Company Creation – Alter – display – Accounts Info – ledger Creation – Voucher Creation – Bank Reconciliation Statement – Bill wise Details – Cost centre and Cost category – Multi Currency – Interest calculation – Budgets and credit limits – Day Book.

TEXT BOOKS:

1. Sanjay Saxena, “MS-OFFICE 2000 for Everyone”, Vikas Pub. House, New Delhi. (Part: I, II, III, IV, V, VI).
2. Tally 9.0 – A Complete Reference – Tally Solutions (P) Limited (Unit V)

SEMESTER III

Subject Title	Data Structures and Algorithms	Semester	III
Subject Code	14U3CAC03	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 5
Objectives			
The Students should have understood the various Data structure Algorithms for stack, Queues, Linked List, Trees, Graphs, Sorting and Searching.			
Unit	Syllabus Contents	Number of Sessions	
I	Design and Analysis of Algorithms: From Problems to Programs - Abstract Data Types - Data Types, Data Structures and Abstract data types.	12	
II	Basic Data Types: The data type “list”-Implementation of list – Stacks – Queues – Trees: Basic Terminology: Order of Nodes – Labeled Trees & Expression Trees - The ADT TREE - Implementations of Trees - Binary Trees: Represent Trees – Huffman codes.	12	
III	Basic Operations on sets : Introduction to Sets - An ADT with Union , Intersection and Difference – A Bit – Vector Implementation of Sets - A Linked List implementation of Sets. Advanced Set Representation Methods: Binary Search trees - Time analysis of binary search trees operation - Balanced Tree implementations of sets.	12	
IV	Directed Graphs: Basic Definitions - Representation for Directed Graphs - The Single source shortest paths problems. Undirected Graphs: Definitions – Minimum Cost Spanning Trees - Traversals.	12	
V	Sorting: The internal sorting model - Some Simple sorting Schemes – Quick Sort – Heap Sort. Algorithm Design Techniques: Divide and Conquer Algorithms - Greedy Algorithm-Backtracking.	12	

Learning Resources	
Text Books	1.“Data Structures And Algorithms” –Alfred V. Aho,John E.Hopcroft,Jeffrey D.Ullman, Pearson Education,Inc And Dorling Kindersley Publishing Inc.(Chapter 1, 2, 3, 4, 5, 6, 7, 8, 10)
Reference Books	1.Ellis Horowitz , Sartaj Sahni and Susan Anderson, “Fundamentals of Data Structures using C” Computer Science Press, 1993. 2. Jean Paul Tremblay and Paul G. Sorenson, “An Introduction to data structures with applications” 2 nd edition, Tata McGraw-Hill, 2001.
Web Sites / Links	1) https://www.cs.auckland.ac.nz/~jmor159/PLDS210/ds_ToC.html 2) https://people.mpi-inf.mpg.de/~mehlhorn/Toolbox.html

Subject Title	Visual Programming	Semester	III
Subject Code	14U3CAC04	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 4

Objectives

Understood the doing project, creating controls, variables, data types, functions, procedures, arrays.

Unit	Syllabus Contents	Number of Sessions
I	Welcome to visual Basic –What is visual basic- Features of visual Basic – developing an Applications. Creating an Application: Objectives-What does visual basic 6 have to create applications-OLE- Form Layout window. Forms and controls: Objectives- The From-Working with a Control- Opening the code Window.	12
II	Variables in visual basic: Objectives-what is a variable-Declaring variable-data types-the null value-Error value-empty value-scope of a variable – module level variables- Declaring variable- constant-creating your own constant-scope of a constant. Writing code in visual basic-objectives- the code window –The Anatomy of procedure-Editing features. Working with files- objectives –visual basic file system controls.	12
III	Menus: objectives- Building the user interface. Multiple document interface applications –Why MDI forms- features of an MDI form-loading MDI forms and child forms	12
IV	Working with the data control: The data control-The bound controls-caution-coding. Data access objects: The JET database engine-functions of the JET database engine-SQL-The DAO objects model-Why ADO-Establishing a reference.	12
V	Crystal and data reports: Crystal reports-Data report-.Distributing your application.ActiveX: objectives-What is ActiveX –Why ActiveX. ActiveX and Web pages: objectives-ActiveX and internet.ActiveX documents.	12

Learning Resources

Text Books	Mohammed. Azam, “Programming with Visual Basic 6.0” - VIKAS publishing House Pvt. Ltd, (2010). (Chapter-1,2,3,4,5,6,7,8,12,13,15,16,18,19)
Reference Books	1. Mastering Visual Basic 6” Evangelus Petroustos BPB Puhlnata. 2. Gray Cornell, “VISUAL BASIC 6 from the GROUND UP”, Tata McGraw Hill Edition, 1999.
Web Sites / Links	1) http://www.vbtutor.net/vbtutor.html 2) http://www.vbtutes.com/p/visual-basic-60-tutorial.html

Subject Title	Operating Systems	Semester	III
Subject Code	14U3CAC05	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 4
Objectives			
1 The Students know of the versatility of the microcomputer with page-design software, enabling students to produce materials of near photo-typed quality.			
Unit	Syllabus Contents	Number of Sessions	
I	What Is Operating System – Application Bases – Operating System Environment – Operating System Components and Goals – Operating System Architecture - Process Concepts: Introduction – Process Management – Inter Process Communication.	12	
II	Thread Concepts: Definition Of Thread – Life Cycle Of Thread – Thread Operations – Threading Models - Thread Implementations – Asynchronous Concurrent Execution: Mutual Exclusion – Software Solutions to the Mutual Exclusion Problem –Semaphores.	12	
III	Deadlock: Introduction – Examples of Deadlock – Resource Concept – Deadlock Prevention – Deadlock Avoidance with Dijkstra’s Banker’s Algorithm – Deadlock Detection – Deadlock Recovery. Process Scheduling: Scheduling Levels - Preemptive Vs Non-Preemptive Scheduling – Scheduling Algorithm – Real-Time Scheduling.	12	
IV	Memory Management – Single-user Contiguous Memory Allocation – Fixed Partition Multiprogramming –Variable Partition Multiprogramming – Multiprogramming With Memory Swapping. Virtual Memory Management: Introduction - Demand Paging - Page Replacement - Page Replacement Strategies.	12	
V	File and Database Systems: File Systems – File Allocation – File Space Management-File Access Control.	12	

Learning Resources	
Text Books	H.M.Deitel, P.J.Deitel, D.R.Choffnes, “Operating Systems” 3 rd Edition, Pearson Publication.(Chapter-1,3,4,5,7,8,9,11,13).
Reference Books	William Stallings “Operating Systems – Internals & Design Principles” PHI (P) Ltd, New Delhi – 110001. 5th Edition.
Web Sites / Links	1) http://www.tutorialspoint.com/operating_system/ 2) http://viralpatel.net/taj/operating-system-tutorial.php/

Subject Title	Visual Basic Programming Lab	Semester	III
Subject Code	14U3CACP03	Specialization	NA
Type	Practical	L:T:P:C	0 : 0 : 5 : 3

Objectives

To have practical understanding in VB programming.

LIST OF EXPERIMENTS

1. Create a form to change the background color of a form.
2. Write a VB program accept two strings in two text boxes and concatenate them and display in a single label box.
3. Design a form to print the prime numbers.
4. Create a form to change the font size using timer control.
5. Create a VB program to add and remove the items in the list box using add item and remove item methods.
6. Write a VB program to add and read the data in a sequential file.
7. Construction of an Arithmetic Calculator (Simple).
8. Preparation of Students Mark Sheet. (using database)
9. Personal Information System (Using database and create data report)
10. Write a VB program to display the employee details in the form using Active X Data Control.

Subject Title	Financial Accounting	Semester	III
Subject Code	14U3CMA03	Specialization	NA
Type	Allied	L:T:P:C	5 : 0 : 0 : 3

Objectives

In a practical sense, the main objective of financial accounting is to accurately prepare the final accounts, otherwise known as the financial statements. The three primary financial accounts are the income statement, the balance sheet and the statement of cash flows.

Unit	Syllabus Contents	Number of Sessions
I	Introduction of Accounting- Objectives- Advantages-Limitations of Accounting- People interested in Accounting- Branches of Accounting- Accounting Concepts and Conventions.	10
II	Preparation of Journal – Ledger- Subsidiary Books – Trial Balance	10
III	Final Accounts of a Trading Concern – Trading Account – Profit & Loss Account – Balance Sheet with simple Adjustments.	10
IV	Average Due Date – Account Current.	12
V	Depreciation Accounting – Definition- Objectives- Causes of Depreciation – Reason for providing Depreciation – Depreciation Methods:- Fixed- Written down Value- Annuity Method.	10

Learning Resources

Text Books	<ol style="list-style-type: none"> 1. R.L.Gupta & V.K. Gupta, “Financial Accounting” Sultan Chand & sons, New Delhi, 2008 2. S.P.Jain & K.L.Narang. “Financial Accounting” Kalyani Publishers, New Delhi , 2006
Reference Books	<ol style="list-style-type: none"> 1. S.P.Jain & K.L.Narang “Advanced Accountancy” Kalyani Publishers, New Delhi, 2006. 2. M.C.Shukla & T.S.Grewal. “Advanced Accountancy” S.Chand Publications, New Delhi, 2004.
Web Sites	1) http://study.com/academy/course/financial-accounting.html

SEMESTER IV

Subject Title	Software Engineering	Semester	IV
Subject Code	14U4CAC06	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 5
Objectives			
To provide a hands on experience in the DTP package.			
Unit	Syllabus Contents	Number of Sessions	
I	Software and Software Engineering: The nature of software – Software Engineering-software process-software engineering practice-software myths- Process Models: Generic process models-prescriptive process models-specialized process models-unified process.	12	
II	Agile Development: Agile process-Extreme programming-Agile process models- Principles that guide practice: core principles-Framework activity- Understanding requirements: Requirements Engineering-Eliciting requirements.	12	
III	Requirement modeling: Requirement Analysis-Scenario based modeling-Data modeling concepts-Class based modeling –Flow oriented modeling-patterns for requirements modeling-requirements modeling for WebApps.	12	
IV	Design concepts: Design concepts-Design model- Architectural Design: Software Architecture-Architectural styles-Architectural design- component level Design: Designing class based components-Designing Traditional components-component based development.	12	
V	Quality Management: Software quality-Achieving software quality- software Testing strategies: system testing-The Arts of Debugging- Testing conventional Applications: White box testing-Basis path testing-control structure testing –black box testing-Model based testing- Risk Management: Software Risks-Risk identification-Risk Refinement.- Software process improvement: The SPI process-CMMI-People CMM	12	

Learning Resources	
Text Books	Roger S.Pressman, “Software Engineering” A Practitioner’s Approach”-Mc Graw Hill International, 7 th Ed 2010 (Chapter 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 17, 18, 28, 30)
Reference Books	1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach” - 6 th Edition, Tata McGraw Hill International Edition. 2. Richard Fairley, “Software engineering concepts” McGraw Hill Publication.
Web Sites	1) http://www.tutorialspoint.com/software_engineering/ 2) https://www.wiziq.com/tutorials/software-engineering

Subject Title	Relational Database Management System	Semester	IV
Subject Code	14U4CAC07	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 5
Objectives			
To enable the students to learn the database system Relational algebra and calculus, normal forms, parallel and distributed system.			
Unit	Syllabus Contents	Number of Sessions	
I	Introduction to DBMS: Information – Data and Data Management – File based data management – Organization of a database – Characteristics of a data in a database – DBMS: Benefits of DBMS – Functions of DBMS – Components of DBMS – data dictionary - data base users. Data Base Architecture and Design: Introduction – Data base architecture – data abstraction – ANSI/SPARC Architecture. - Database Language – Data base Design – Design Constraints.	12	
II	Data Models : Introduction – Conceptual, Physical and logical database model – database relationship – hierarchical model - network model – relational model – ER model – object oriented model – object relational model – Comparison between the various model Entity Relationship Model: Introduction – ER Model – Components of ER model – ER diagram conversions – Relationships – composite entities – entity list – ER diagrams – ER modeling symbols	12	
III	RDBMS: Introduction – RDBMS terminology – relational data structure – codd's rules Relational data integrity and database constraints: Introduction – integrity constraint – Data Normalization: Introduction – pitfalls in relational database design – decomposition – functional dependencies – Normalization: Keys – relationships – Types of Normal forms – De-normalization. Relational Algebra: Introduction – relational algebraic operations – Aggregate functions – update operations. Relational calculus: Introduction – tuple relational calculus – domain relational calculus.	12	
IV	SQL: Introduction – history of SQL – characteristics of SQL – Advantages of SQL – SQL data types and literals – types of SQL commands – SQL operators – Tables, views and Indexes: Introduction – Views – Indexes. Aggregate functions – INSERT, UPDATE and DELETE operations– join and union	12	
V	PL/SQL: Programming language: History – Fundamentals – Block structure – comments – Data types – other data types – Declaration – Assignment operation – Bind variables – Substitution variables – printing.PI/SQL cursor and exceptions – PL/SQL Composite data types: Records – Tables. PL/SQL Named block: Procedure – Function – Package – Triggers.	12	

Learning Resources	
Text Books	<ol style="list-style-type: none">1. Alexix Leon and Mathew Leon, “Fundamentals of Data base management System” TMH Publications Reprint 2010 (Chapter 1, 2, 3, 4, 6, 7, 9, 10, 11, 12, 15, 17, 18, 19, 20, 22, 27).2. Nilesh shah, “Database system using ORACLE” 2nd Ed., PHI publication Reprint 2010 (Chapter 10, 11, 12, 13, 14).
Reference Books	Silberschatz, Korth, “Database System Concepts” MCH International Sixth Edition.
Web Sites	<ol style="list-style-type: none">2) http://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm3) http://rdbms.ca/database/introduction.html

Subject Title	Client Server Computing	Semester	IV
Subject Code	14U4CAC08	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 4
Objectives			
To provide a hands on experience in the DTP package.			
Unit	Syllabus Contents	Number of Sessions	
I	Client/Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.	12	
II	Components of Client/Server Applications – The Client: Role of a Client – Client Services – Request for Service- The Server: The Role of a Server – The Network Operating System – What are the Available Platforms – The Server Operating system.	12	
III	Components of Client/Server Applications – Connectivity: Open System Interconnect – Communications Interface Technology – Interprocess communication – WAN Technologies.	12	
IV	Components of Client/Server Applications–Software: Factors Driving demand for application software development – Client/Server System Development Methodology -Components of Client/Server Applications–Hardware: PC-Level Processing Units – Machintosh, notebooks, Pen – UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.	12	
V	Components of Client/Server applications–Service and Support: System Administration. The Future of Client/Server Computing: Enabling Technologies – Transformational Systems.	12	

Learning Resources	
Text Books	1. Patrick Smith, Steve Guenferich, “CLIENT/SERVER COMPUTING”, 2 nd Edition, PHI Private Limited, New Delhi, 2010. (Chapters 1, 2, 3, 4, 5, 6, 7, 8 & 10)
Reference Books	1. Dawna Travis Dewire, “Client/Server computing”, Tata McGraw Hill. 2. Jafferey D. Schank, “Novell’s guide to Client/Server Application and Architecture”, BPB Publications.
Web Sites	1) www.tutorialspoint.com/data_communication_computer_network/client_server_model.htm 2) http://www.roseindia.net/tutorialsearch/?t=client/server+computing

Subject Title	Relational Database Management Systems Lab	Semester	III
Subject Code	14U4CACP04	Specialization	NA
Type	Practical	L:T:P:C	0 : 0 : 5 : 3

Objectives

To enable the students to learn the database system Relational algebra and calculus, normal forms, parallel and distributed system.

List of Experiments

1. Table Creation

i) Create the table with the following attribute

Table Name: Employee

Attributes: Eno (PK), Ename, Dept, Design, Salary, Phone_Number

ii) Alter the table employee, add the column age, community.

2. Data Manipulation

i) Insert the values to the above table

ii) Display the employee names who is working as "Lecturer"

iii) Display the table in ascending order

iv) Update the table employee; add 20% Bonus to each employee

QUERIES

v) Select ename from employee table such that salary greater than 8000.

vi) Select Eno, Ename from employee whose salary between 6000 and 15000.

vii) Create a view tick from employee with Ename, Phone, and Department.

3. Simple queries using built in functions

4. Simple queries using set operations

PL/SQL

6. a) Creation of student information records containing Reg.No,Name,Subject Code, Marks, Course and Grade.

b) Find the Total and average for each student table.

c) Record Manipulations such as deletion, Modification, Addition and Counting the record.

7. Writing a PL/SQL Program to find the total amount based on rules similar to the following

i) If UNIT <= 100 then Price is 85 paise per UNIT.

ii) If UNIT >101 and <= 150 then Price is 1.50 paise per UNIT.

iii) If UNIT > 151 then Price is 2.00 paise per UNIT.

8. Write a PL/SQL block to count the number of students in each department. If the count value is greater than 60 in each department, then transfer the excess records into another table department wise. Use exception handler to handle this routine.

9. Write a database trigger to implement the concept of master detail relationship.

10. PL/SQL procedure to design Pay Bill.

Subject Title	Cost and Management Accounting	Semester	IV
Subject Code	14U4CMA04	Specialization	NA
Type	Allied	L:T:P:C	5 : 0 : 0 : 3
Objectives			
To provide a hands on experience in the DTP package.			
Unit	Syllabus Contents	Number of Sessions	
I	Cost accounting – Meaning, Scope, objectives- Advantages & Limitations- Difference between Cost accounting and Financial Accounting – Elements of Cost – Preparation of Cost Sheet.	10	
II	Material Management – Purchase Procedure – Various stock levels- Economic Order Quantity – Bin Card and stores ledger-Pricing of issues – FIFO, LIFO – Simple Average and weighted average Methods – Stock Control.	10	
III	Management Accounting: Nature and Scope- Meaning and definition- Objectives- Management Accounting and Financial Accounting- Management Accounting and Cost Accounting.	10	
IV	Budget and Budgetary Control: Meaning, Importance, Preparation of Sales Budget, Production Budget- Raw materials Budget – Cash Budget – Flexible Budget	10	
V	Marginal Costing – Break Even Analysis for profit planning and Control – P/V ratio- BEP and Margin of Safety.	10	
Note: Distribution of Marks – Problems 70% and Theory 30%.			

Learning Resources	
Text Books	1. Jain & Narang, “Cost Accounting” Kalyani Publishers, New Delhi , 2006 2. S.N. Maheswari, “Management Accounting” Sultan Chand & Sons, New Delhi, 2005.
Reference Books	1. Reddy & Hari Prasad Reddy, “Cost Accounting” Margham Publishers, Chennai, 2009. 2. Dr. S. Ganesan and Kalavathi, “Management Accounting” Thriumalai Publications, Nagarkoil, 2008
Web Sites	1) http://www.tutorialspoint.com/accounting_basics/management_accounting_introduction.htm 2) http://jutaacademic.co.za/products/cost-and-management-accounting-1-tutorial-workbook

Subject Title	DTP Package	Semester	IV
Subject Code	14U4CAS02	Specialization	NA
Type	SBEC	L:T:P:C	2 : 0 : 0 : 3

Objectives

To provide a hands on experience in the DTP package.

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Choosing the printing house, Fonts – Hardware Requirement for DTP – General Design Consideration – Text Organization – Design Common Media Publication.	5
II	Pagemaker: Getting Started with PageMaker – Working in PageMaker – The PageMaker window – Working with text – Multiple Text Block. Editing text: Making changing in the Publication – Searching by Format – Replacing the Text.	5
III	Formatting Text: Changing the Font Size – Making the text bold – Removing Boldface from the text – Underlining the text – Aligning the text.	5
IV	Photoshop CS2: Introduction and Launching Photoshop CS2 – Exploring the New Interface – Photoshop Tools – Working with Images: Editing Images –Color Modes.	6
V	Making Selections: Making selection-Moving a Portion of an Image – Editing Selections - Filling a selection –Transforming selection-Painting.	6

Learning Resources

Text Books	2. Vikas Gupta, “Comdex DTP Course Kit” Dreamtech Publishers-New Delhi, 2008 (Chapter 1, Pagemaker Chapter 1,2,3,4,6,Photoshop Chapter 1,2,3,4)
Reference Books	Shirish Chavan, “Rapidex Dtp Course Book”, Desktop Publishing.
Web Sites	3) http://photopagetutorial-biplab.blogspot.in/p/pagemaker-tutorial.html 4) http://www.cyber-tech.in/pagemaker-tutorial.html 5) http://www.photoshoptutorials.ws/ 6) http://www.photoshop.com/tutorials

SEMESTER – V

Subject Title	Programming in ASP.NET	Semester	V
Subject Code	14U5CAC09	Specialization	NA
Type	Core-IX	L:T:P:C	5:0:0:5

Objectives:

This subject deals with ASP.NET Programming concepts. Enable to create wide range of Applications and ADO connectivity using ASP.NET. To inculcate knowledge on Java Programming concepts.

Unit	Syllabus Contents	Number of Sessions
I	Getting Started with ASP.NET: Overview of ASP.NET-Understanding Microsoft .NET- ASP.NET Architecture-Using ASP.NET Development Tools Notepad “.NET”-Visual Studio .NET.	12Hrs
II	ASP.NET Development Overview: ASP.NET Project Types- ASP.NET File Types-Visual Studio .NET Features: IDE Enhancements-New Features-Windows-Toolbars-Menus-Options-Understanding Programming Basics-Expressions, Variables, Flow Control, and Constants-Procedures-Flow Control-Error Handling.	12Hrs
III	Creating an ASP.NET Web Application: Creating an ASP.NET Web Application with Visual Studio .NET-Creating a Web Application with the .NET SDK-Configuring ASP.NET Application: Understanding ASP.NET Configuration.	12Hrs
IV	Introducing Microsoft Visual C# and Visual Studio.net: Welcome to C#-Beginning Programming with the visual Studio.NET Environment-Writing Your First Program-Using Namespace-Creating Documentation Using XML and Comments-Creating a Windows Forms Application.	12Hrs
V	Managing Data: Using a Database-Using ADO.NET Database-Database-Working with Data Binding and DataSets: Windows Forms Controls and Data Binding –Disconnected DataSets-Handling XML: Why XML?-The Employee Timesheet System.	12Hrs

Content Beyond Syllabus

1. Database Connectivity: Advantages Of ADO.NET – Managed Data Providers – Developing a Simple ADO.NET Based Application.
2. Creation of Data Table – Retrieving Data From Tables – Table Updating.
3. Disconnected Data Access Through Dataset Objects.

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. Andrew Duthie , “ Microsoft ASP.NET Step by Step “ Prientice Hall of India Pvt. Ltd., Noember 2001. 2. Mc Donald, Mathew, “ASP.net Complete Reference”, TMH 3. John Sharp, Jon Jagger, “Microsoft Visual C# .NET Step By Step “, Prentice Hall of India Private LTd., New Delhi-110 001, 2002
Reference Books	<ol style="list-style-type: none"> 1. Michele Davis, Jon Phillips, ”Learning PHP and MySQL”, 2006 edition, O’Reilly publication 2. Greg Buczek, “ASP.NET Developers Guide”, Syngress Publications.
Web Links:	<ol style="list-style-type: none"> 1. http://hesab.net/book/asp.net/ASP.NET%20Bible.pdf 2. http://xaviers.edu/science/it_sem5.pdf

Subject Title	Programming in JAVA	Semester	V
Subject Code	14U5CAC010	Specialization	NA
Type	Core-X	L:T:P:C	5:0:0:5

Objectives

This subject deals with Java Programming concepts. Enable to create wide range of Applications and Applets using Java. To inculcate knowledge on Java Programming concepts.

Unit	Syllabus Contents	Number of Sessions
I	Overview of Java Language: Introduction – simple java program-Java program structure-Java Tokens-Implementing a Java program Constants, variables, Data Types and Operators: Constants-variables-Data Types-Declaration of variables-Operators and Expression.	12Hrs
II	Classes, objects and Methods: Defining a classes-Field and method declaration-creating objects-constructors-methods overloading-static members-Abstract class. Array: Introduction – One Dimensional Array-Creating Array-Two dimensional Array	12Hrs
III	Inheritance: Extending a class –Overriding methods. Interfaces: Defining Interface-Extending Interface. Packages: Java API package-creating package-Accessing Package	12Hrs
IV	Applet Programming: Building Applet Code-Applet Life Cycle-Designing a web page-Applet Tag-Running the Applet. Graphics Programming: The Graphics Class – Lines and Rectangle-Drawing Arcs-Drawing polygons-Line graphics-Drawing bar Chart	12Hrs
V	.AWT Event Handling: Introduction to AWT package-Introduction to swings. Input/Output Files: Introduction to Files and Streams	12Hrs

Content beyond syllabus

1. Servlet concepts
2. JDBC Connectivity
3. JSP concepts

Learning Resources	
Text Books	Balagurusamy, “Programming in Java”, 4 th Edition 2010, TMH, New Delhi. Unit–I (Chapter – 3.1,3.2,3.5,3.6,3.9,4.1 – 4.5, 5) Unit –II(Chapter – 8.2 - 8.5,8.7 -8.9,8.16,9.1-9.4) Unit – III (Chapter – 8.11, 8.12,10.2,10.3,11.2,11.5,11.6) Unit – IV (Chapter –14.4,14.5,14.7,14.8,14.10) Unit –V (Chapter – 15.2,15.3,15.5-15.7,15.9-15.11,16.1-16.12)
Reference Books	1. Herbert Scheldt, ”Java2 The complete Reference” -McGraw Hill Publication 2. John R. Hubbard, “Programming With Java”, 2 nd Edition, TMH.
Website / Links	1. www.learnjavaonline.org 2. www.javaworld.com 3. www.onjava.com 4. www.java.sun.com

Subject Title	Mobile Computing	Semester	V
Subject Code	14U5CAE01	Specialization	NA
Type	Elective I	L:T:P:C	5:0:0:5

Objectives: Objectives

This subject deals with Mobile Computing concepts. To explore the knowledge of Telecommunication among the students

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Applications – A Simplified Reference Model. Wireless Transmission: Cellur System. Medium Access Control : Motivation for a Specialized MAC : Hidden and exposed terminals – Near and far terminals – SDMA – FDMA – TDMA : Fixed TDM – Classical Aloha – Slotted Aloha – Carrier Sense Multiple Access – Demand Sense Multiple Access – PRMA Packet Reservation Multiple Access – Reservation TDMA – Multiple Access With Collision Avoidance – Polling – Inhibit Sense Multiple Access. CDMA: Spread Aloha multiple access.	12Hrs
II	Telecommunication Systems: GSM: Mobile Services – System Architecture – Radio Interface – Protocols - Localization And Calling – Handover – Security – New Data Services. DECT: System Architecture – Protocol Architecture TETRA.	12Hrs
III	UMTS and IMT 2000: UMTS Releases And Standardization – UMTS Architecture - UMTS Radio Interface – UTRAN – Core Network – Handover. Broad Cast Systems: Overview – Cyclical Repetition Of Data – Digital Audio Broadcasting – Digital Video Broadcasting – Convergence of Broadcasting and Mobile Communication.	12Hrs
IV	Wireless LAN: Infra Red Vs Radio Transmission – Infrastructure And Ad-Hoc Network – IEEE 802.11: System Architecture – Protocol Architecture – Physical Layer – Medium Access Control Layer – MAC Management – HIPERLAN: HIPERLAN1 -WATM – BRAN – HiperLAN2.	12Hrs
V	Mobile Network Layer: Mobile IP – Dynamic Host Configuration Protocol – Mobile Ad-Hoc Networks. Mobile Transport Layer: Traditional TCP-Classical TCP Improvement-TCP Over 2.5/3G.	12Hrs

Learning Resources

Text Books	“Mobile Communications”, Jochen Schiller , Pearson Education. Second Edition.
Reference Books	Principles of Mobile Communication, Second Edition is an authoritative treatment of the fundamentals of mobile communications
Website / Links	http://wsl.stanford.edu/~andrea/Wireless/SampleChapters.pdf http://ee.sharif.edu/~pr.wireless.comm/references/Schwartz.pdf

Subject Title	Software Testing	Semester	V
Subject Code	14U5CAE02	Specialization	NA
Type	Elective II	L:T:P:C	5:0:0:5

Objectives

- 1.To understand testing process.
2. To enable the students to write test case
3. become familiar in software testing.

Unit	Syllabus Contents	Number of Sessions
I	Building a Software Testing Strategy – Software Testing Design Techniques – Software Testing Tools and Selection of Test Automation Products – Software Testing Lifecycle and Software Testing Process	12Hrs
II	Testing Effort Estimation and Test Planning – Software Test Effort Estimation Technique – Pre-Development Testing Requirements and Design Phase – Best Practices in Program Phase Unit, System and Integration Testing.	12Hrs
III	A Case Study on Acceptance Testing – Implementation an Effective Test Management Process – Building an Effective Test Organization – Performance Issues and Optimization Techniques.	12Hrs
IV	Choosing a Load Testing Strategy – Dodging the Bullets – Validating Mission-Critical Server Software for Reliability – Probing the Blind Spot – Testing in Today’s Business and Usability.	12Hrs
V	Testing of Web-based Applications – Testing of Embedded Software System used in Aerospace Applications – Testing Application for Security – Testing Metrics, Best Practices and Benchmarks.	12Hrs

Learning Resources

Text Books	1.“Software Testing Effective Methods, Tools and Techniques” by Renu Rajani and Pradeep Oak, Tata McGraw-Hill, 9 th Reprint 2009.
Reference Books	1.“Software Testing Principles and Practices” by Srinivasan Desikan & Gopalswamy Ramesh, Pearson Education, Sixth Impression, 2008.
Website / Links	http://www.tutorialspoint.com/software_testing/software_testing_pdf_version.htm http://www.computing.dcu.ie/~ray/teaching/CA358/dorothy_graham.pdf

Subject Title	Computer Networks	Semester	V
Subject Code	14U5CAE03	Specialization	NA
Type	Elective III	L:T:P:C	5:0:0:5

Objectives

- To understand the basics of Computer Networks.
- To understand the layers of computer Networks.
- Become familiar with the basics of computer network architectures and protocols

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Business Applications - Home Applications – LAN – WAN- MAN- Protocol Hierarchies – Protocols and Standards-Connection Oriented and Connection less Services – OSI Reference Model.	12Hrs
II	Physical Layer Transmission Media: Guided Transmission media - Wireless Transmission - Communication Satellites - Public Switched Telephone Network.	12Hrs
III	Data Link Layer: Data Link Layer Design Issues - Error Detection and Correction – Elementary data link protocols - Sliding Window Protocols - Protocols Verification.	12Hrs
IV	Network Layer: Network Layer Design Issues. Routing Algorithms: Shortest Path- Link State – Distance Vector. Congestion Control Algorithms: Principles – Load Shedding. Internetworking: Tunneling – Fragmentation – IP Addresses – Protocols – OSPF.	12Hrs
V	Transport Layer: Transport Services – Elements of Transport protocols – Application layer: DNS– Electronic mail-World Wide Web. Network Security: Cryptography-Symmetric and Public-key algorithms-Digital signatures.	12Hrs

Learning Resources

Text Books	1. “Computer Networks” Andrew S. Tanenbaum, Fifth edition, PHI private Ltd, New Delhi , 2009.
Reference Books	1. Behrouz A. Forouzan, “ Data Communication and Networking”, Tata MC- Hill, 2009.
Website / Links	https://en.wikipedia.org www.tutorialspoint.com https://www.coursera.org

Content beyond the Syllabus

1. Basics of TCP/IP
2. Security Issues on Network
3. Overview of wireless networks

Subject Title	Practical-V Programming in ASP.NET Lab	Semester	V
Subject Code	14U5CACP05	Specialization	NA
Type	Core-Practical-V	L:T:P:C	5:0:0:5

Unit	LIST OF PROGRAMS	Number of Sessions
I	<p>Practical Programs</p> <ol style="list-style-type: none"> 1. Write a simple program to display text in ASP.NET. 2. Create an application using ASP.NET to determine whether a number is odd or even. 3. Create an application using ASP.NET to determine whether a number is prime or not 4. Create an application using ASP.NET to change the type of border style given in a dropdown list box 5. Create a web form for online quiz. The Marks earned by the user should be displayed back. 6. 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 is to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls. 7. Create a package to prepare employee pay slip using ADO.NET. 8. Develop a simple application to display students mark list. 9. Create, build and run an application that uses web forms 10. Create and open a connection of a database and use the data form wizard to create a simple data access application 	50

Subject Title	Practical-V Programming in JAVA Lab	Semester	V
Subject Code	14U5CACP06	Specialization	NA
Type	Core-Practical-VI	L:T:P:C	5:0:0:5

Unit	Syllabus Contents	Number of Sessions
	<ol style="list-style-type: none"> 1. Write a Java Applications to extract a portion of a character string and print the extracted string. 2. Write a Java Program to implement the concept of multiple inheritance using Interfaces. 3. Write a Java Program to create an Exception called payout-of-bounds and throw the exception. 4. Write a Java Program to draw several shapes in the created windows. 5. Write a Java Program to create a frame with four text fields name, street, city and pin ode with suitable tables. Also add a button called“my details”, When the button is clicked its corresponding values are to be appeared in the text fields. 6. Write a Java Program to demonstrate the Multiple Selection List-box. 7. Write a Java Program to create a frame with three text fields for name, age and qualification and a text field for multiple line for address 8. Write a Java Program to create Menu Bars and pull down menus. 9. Write a Java Program to draw circle, square, ellipse and rectangle at the mouse click positions. 10. Write a Java Program which open an existing file and append text to that file. 	50

Subject Title	Open Source Technologies	Semester	V
Subject Code	14U5CAS03	Specialization	NA
Type	SBEC	L:T:P:C	2:0:0:2

Objectives

- Learn PHP to create web page presentation and produce reports in the website
- How to Write Coding in PHP
- Learn MySQL server as a backend.
- To Use the Connectivity of PHP with MySQL.

Unit	Syllabus Contents	Number of Sessions
I	Introduction to PHP: History - General Language Features – PHP Basics: Embedding PHP Code in your Web Pages - Commanding Your Code - Output Data to the Browser .	5Hrs
II	Using PHP With MySQL- Modifying The Template - Connecting To MySQL - Executing Simple Queries - Retrieving Query Results -Ensuring Secure SQL- Counting Returned Records- Updating Records With PHP.	5Hrs
III	PHP's Supported Data Types Identifiers – Variables – Constants – Expressions – String – Interpolation. Control Structures: Conditional Statements - Looping Statements - File Inclusion Statements - Functions: Invoking a Function - Creating a Function - Function Libraries.	5Hrs
IV	Arrays: Creating an Array - Adding and Removing Array Elements - Locating Array Elements - Traversing Array - Merging – Slicing - Splicing and Dissecting Array. Object Oriented PHP: Benefits of OOP - Key OOPs Concepts.	5Hrs
V	Strings and Regular Expression: Other String Specific Function - Alternatives for Regular Expression Functions. Forms: PHP and Web Forms.	5Hrs

Content Beyond Syllabus

1. Advanced OOPs Features PHP
2. Accessing MySQL
3. PHP& MySQL Connectivity

Learning Resources

Text Books	<ol style="list-style-type: none"> 1. “Beginning PHP and Oracle From Novoice to professional” W.Jason Gilmore and Bob Brylr edition – 2008 2. “PHP 6 and my SQL 5 ” Larry Ullman -2008(chapter 4 & 8)
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Reference Books	<ol style="list-style-type: none">1. “Spring into PHP the Small Professional choice” Steven Holzner, Pearson education, Edition: First Impression 2006.2. “PHP and my SQL for dynamic websites” – Larry Ullam-fourth edition 20153. “PHP 6 and my SQL ”: bible – Steve Suehring, Tim converse, Joy Park - 2009
Website / Links	<ol style="list-style-type: none">1. http://www.w3schools.com/php/php_mysql_intro.asp2. http://www.tutorialspoint.com/mysql/mysql-php-syntax.htm3. http://downloads.mysql.com/docs/apis-php-en.pdf4. http://php.net/manual/en/book.mysql.php

Subject Title	Soft Skills	Semester	V
Subject Code	14U5CAS04	Specialization	NA
Type	SBEC-IV	L:T:P:C	2:0:0:2

Objectives

To enable students to build a repositories of functional vocabulary and to move from the lexical level to the syntactic level. To train students to summon words, phrases relevant to the immediate communication tasks. To enable students to comprehend the concept of communication. To teach students the four basic communication skills, Listening, Speaking, Reading and Writing

Unit	Syllabus Contents	Number of Sessions
I	Nature of technical communication: Communication as sharing – Stages of communication – Channels of communication – Nature of technical communication – Importance and need for technical communication – Technical communication skills.	5Hrs
II	The Listening process: Types of listening – Listening with a purpose – Barriers to listening –The speech process – Conversation and oral skills – Strategies for good conversation – Improving fluency and self-expression – Body language.	5Hrs
III	Job interviews: Interview process – Characteristics of job interview– Pre-interview preparation techniques – Interview questions – Answering strategies – Frequently asked interview questions – Projecting a positive image – Alternative interview formats.	5Hrs
IV	Group Discussion: Nature of group discussion – Characteristics of successful group discussions – Selection group discussion – Group discussion strategies – Techniques for individual contribution – Group interaction strategies.	5Hrs
V	Presentation Skills: Nature and importance of oral presentation – Planning the presentation – Preparing the presentation – Organizing your presentation – Rehearsing the presentation – Improving delivery.	5Hrs

Learning Resources

Text Books	Effective Technical Communication , M. Ashraf Rizvi, Tata McGraw – Hill Publishing Company Limited , New Delhi. Unit -I (Chapter-1), Unit-II(Chapter-4,6), Unit-III(Chapter-9), Unit-IV(Chapter-10), Unit-V(Chapter-11).
Reference Books	<ol style="list-style-type: none">1. Monippally, Matthukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw-Hill. New Delhi2. Sasikumar.V and P.V. Dhamija. “Spoken English: A Self-Learning Guide to Conversation Practice. “, 1993 34th Reprint. Tata McGraw-Hill. New Delhi.

SEMESTER – VI

Subject Title	Computer Graphics	Semester	VI
Subject Code	14U6CAC11	Specialization	NA
Type	Core-XI	L:T:P:C	5: 0 : 0: 5

Objectives:

This course gives an insight into advanced features of Java.

Unit	Syllabus Contents	Number of Sessions
I	Introduction to Computer Graphics-GUI-Video Display Devices-CRT-Raster and Random scan displays-Input Devices-Hard Copy Devices-Line Drawing Algorithm-DDA Algorithm-Line Function –Circle Generating Algorithm.	12Hrs
II	Line Attributes-Curve Attributes-Color and Gray Scale Levels-Area Fill Attributes-Character Attributes-Bundled Attributes-Basic Transformations-Matrix Representations-Composite Transformation-Translation-Rotation-Scaling-Reflection and Shear.	12Hrs
III	2D Transformations- 3D Transformations-Viewing Pipeline- Viewing Functions-Point Clipping and Line Clipping-Cohen Sutherland Line Clipping-Polygon Clipping – Sutherland –Hodgeman Clipping-Curve and Text Clipping-Exterior Clipping.	12 Hrs
IV	Basic Modeling Concepts-Input of Graphical Data-Input Functions-Picture Construction Techniques.	12Hrs
V	3D Display Methods-3D Concepts-Depth Buffer Method- A Buffer Method - Scan Line Method-Color Models- Xyz, RGB-YIQ CMY Color Models.	12 Hrs

Learning Resources	
Text Books	1. COMPUTER GRAPHICS”-Donald Hearn And M. Puelin Baker- SECOND EDITION UNIT I Chapter 1, 2, 3,UNIT II Chapter 4, 5,UNIT III Chapter 6,UNIT IV Chapter 7, 8,UNIT V Chapter 9, 13, 15
Reference Books	COMPUTER GRAPHICS: PRINCIPLES AND PRACTICE (HARDCOVER) BY JAMES D. FOLEY (SHELVED 4 TIMES AS <i>COMPUTER-GRAPHICS</i>)
Web Sites / Links	<ol style="list-style-type: none"> 1. http://www.w3schools.com/php/php_mysql_intro.asp 2. http://www.tutorialspoint.com/mysql/mysql-php-syntax.htm 3. http://downloads.mysql.com/docs/apis-php-en.pdf 4. http://php.net/manual/en/book.mysql.php

Content Beyond the Syllabus:

- Graphics Systems and Models
- Graphics Programming
- Input and Interaction
- Geometric Objects and Transformations
- Viewing

Subject Title	Practical – VII Computer Graphics Lab	Semester	VI
Subject Code	14U6CACP07	Specialization	NA
Type	Core-Practical-VII	L:T:P:C	0 : 0 : 5 : 2

Objectives:

To learn the practical knowledge of applications of Computer Graphics Applications.

LIST OF PROGRAMS	Number of Sessions
<ol style="list-style-type: none"> 1. DDA Line Drawing Algorithm. 2. Circle Generating Algorithm. 3. 2D Transformations. 4. 2D Other Transformations. 5. 3D Transformation. 6. 3D Other Transformations. 7. 3D Viewing Concepts. 8. Clipping Operations (Line, Curve, Text). 	50

Subject Title	Practical -VIII Project Work (In House Project)	Semester	VI
Subject Code	14U6CACPR01	Specialization	NA
Type	Practical -VIII	L:T:P:C	4 : 0 : 0 : 3

Objectives:

To learn the knowledge of applications oriented Projects.

LIST OF PROJECTS	Number of Sessions
PROJECT WORK PATTERN	
<p>FIRST REVIEW: (20 Marks)</p> <ol style="list-style-type: none"> 1. Project Title 2. Project Platform (Language / Package Selected) 3. Confirmation Letter (from Company / Industry) 4. Details of Internal Guide with Designation & Qualification (in the company / Industry/Organization). 5. Presentation <p>SECOND REVIEW: (20 Marks)</p> <ol style="list-style-type: none"> 1. Work Observation 2. Modules in Project (Design Screens Sample) 3. DFD / ERD / System Flow Diagram (Whichever Applicable) 4. Estimated Time of Completion 5. Completed Work in the form of Percentage Analysis 6. PowerPoint Presentation. <p>FINAL REVIEW: (60 Marks)</p> <ol style="list-style-type: none"> 1. Documentation 2. Screens Shots 3. DFD / ERD / System Flow Diagram (Whichever Applicable) 4. Final Project Report (with executable format including complete source code) <p>The Passing minimum shall be 40% out of 60 marks (24 Marks)</p>	50

Subject Title	SBEC-V JAVA Script	Semester	VI
Subject Code	14U6CAS05	Specialization	NA
Type	SBEC-V	L:T:P:C	4 : 0 : 0 : 4

Objectives:

To learn about graphics and multimedia by practicing with drawing algorithms, animation and compression techniques.

Unit	Syllabus Contents	Number of Sessions
I	Understanding JavaScript: Learning Web Scripting Basics – How Java Script fits into a Web page - Browsers and JavaScript. Creating Simple Scripts : Tools for Scripting – Beginning the Script – Adding JavaScript Statements – Creating Output.	5 Hrs
II	Using Variables, String and Arrays: Using Variables – Expressions and Operators - Data Types in JavaScript – String Objects – Using Numeric and String Arrays. Functions and Objects: Using Functions – Introducing Objects – Using Objects to simplify Scripting – Extending Built-in Objects.	5 Hrs
III	Controlling Flow with Conditions and Loops : The if Statement – Using Shorthand Conditional Expressions – Testing Multiple Conditions with If and Else – Using Multiple Conditions with switch – Using for Loops – Using While Loops – Using Do . . . While Loops. Using Built-in Functions and Libraries: Using the Math Object – Working with Math Functions.	5 Hrs
IV	JS Forms- Forms Validation Forms API-JS Objects-Object Definitions-Object Properties Object Methods Object Prototypes-	5 Hrs
V	JS Functions- Function Definitions Function Parameters Function Invocation Function Closures	5 Hrs

Learning Resources

Text Books	1. Teach Yourself Java Script in 24 Hours by Michael Moncur, Fourth Edition, published by Pearson Education.
Reference Books	2. Java Script Design Patterns. Addy Osmani, Beginner
Web Sites / Links	1. http://www.w3schools.com/php/php_mysql_intro.asp 2. http://www.tutorialspoint.com/mysql/mysql-php-syntax.htm 3. http://downloads.mysql.com/docs/apis-php-en.pdf 4. http://php.net/manual/en/book.mysql.php

Content Beyond the Syllabus:

1. Client side and server side scripting .(Javascript,Servlets,jsp,php,Apache Http Server)
2. HTML5-CSS3- HTML 5 (canvas, inline, internal and external style sheet,css box model,Text flow,css3-user style sheets)
3. Web site creation using tools.(Adobe Flash ,Adobe flex)
4. Web site creation using tools.(Microsoft Silverlight ,Adobe dreamweaver)

Subject Title	SBEC -VI CorelDRAW	Semester	VI
Subject Code	14U6CAS06	Specialization	NA
Type	SBEC-VI	L:T:P:C	3 : 0 :0: 2
Objectives:			
To learn about design techniques of corelDRAW and working with the Applications.			
Unit	Syllabus Contents	Number of Sessions	
I	Understanding corelDRAW -graphics suite x4- corelDRAW-graphics suite applications-new and enhanced feature in corelDRAW- getting started with corelDRAW- exploring the workspace of corelDRAW- menu bar-standard-toolbar-property bar-tool box-drawing page-docker-color palette-drawing basic geometric figures- working with page layout	5Hrs	
II	Working with lines -Drawing a curve-drawing calligraphic lines-about outline tool-defining lines and outlines setting-creating a calligraphic outline-adding an arrowhead	5 Hrs	
III	Working with objects -Selecting and deselecting objects-Deleting objects-sizing objects- combing objects-grouping in corelDRAW-grouping objects-ungrouping objects- applying convert to curve command on objects-selecting color on objects-filling objects-using fills-using pattern fills	5Hrs	
IV	Working with text -Types of text-preparing layout for using the text-creating artistic text-creating paragraph text- converting text from one type to another changing the appearance- font-font size- alignment-applying effects- drop cap- bulleted list-wrapping paragraph-converting text to an object-curve command-breaking part text	5 Hrs	
V	Working with bitmaps -Changing vector images to bitmap images – converting vector images to bitmap images- converting vector images to bitmap images when exporting –importing a bitmap into drawing-cropping-resembling and resizing-special effects to bitmaps-color transform-sharpen-tracing	5 Hrs	

Learning Resources

Text Books	1. Comdex 9 in 1 DTP Course Kit, VIKAS GUPTA, Dream Tech Press
Reference Books	2. CorelDRAW X7 Users Guide, 2014 Coral Corporation. 3. CorelDRAW: The basics Overview, SOLAR LASER SYSTEMS LTD.
Web Sites / Links	1. product.corel.com/help/CorelDRAW/540229932/Main/EN/.../CorelDRAW-X7.pdf 2. learn.corel.com › Graphics Tutorials › CorelDRAW Tutorials 3. www.coreldraw.com/us/pages/800382.html

Content Beyond the Syllabus:

1. Creating a logo
2. Create Transparent 3D Box
3. Creating a Party Invitation Card

Subject Title	E-Commerce	Semester	VI
Subject Code	14U5CAE04	Specialization	NA
Type	Elective - II	L:T:P:C	5 : 0 :0: 5
Objectives:			
<ol style="list-style-type: none"> 1. To understand the purpose and the value of Ecommerce. 2. To apply the principles of business oriented teams in computer applications. 3. To understand the security issues of Ecommerce. 			
Unit	Syllabus Contents		Number of Sessions
I	Electronic commerce: Electronic Commerce - Electronic Data Interchange - Value Added Networks - Electronic Commerce over the internet - Internet Commerce Examples –Commerce Net. PCs and Networking: Networking - Communication Media. Electronic Mail: Computer communication system ISO's Open System Interconnection model – Electronic Mail - The X.400 message handling system - internet mail - Email security - X.500 directory services - Mail user agent		12 Hrs
II	The Internet: A Brief Introduction- Internet Communication Protocols- Internet Services and Resources - Internet Mail - Internet Search - Concerns About - The Internet –Browsers - Hypertext Markup Language - Java - The Java Electronic Commerce Framework - Internet 2. Intranets: Intranet Services - Intranet Implementation - The Webmaster. Electronic Data Interchange: Electronic Data Interchange Costs and Benefits – Components of EDI Systems EDI Implementation Issues - Legal Aspects.		12 Hrs
III	The UN/EDIFACT Standard: Introduction - An EDIFACT Message - Interchange structure –UN/EDIFACT Message Directories. The Internet and Extranets for Electronic Commerce: E-Commerce - Commerce over The Internet - Commerce Over Extranets. Identification and Tracking Tools for Electronic Commerce: The EAN System - EANCOM - Article Numbering - Bar Coding. The serial shipping container code and the EAN label - EAN Location Numbers .		12 Hrs
IV	Legal Issues: Paper Documents Versus Electronic Document – Technology for Authenticating an Electronic Document - Laws for E-Commerce - EDI Interchange Agreement - Legal Issues for Internet Commerce. E-Commerce in India: EDI India. The Internet in India - Laws for E-Commerce in India.- Setting Up a Website - webServers - Business - To-Business EC - Payment for Goods and Services Bottlenecks. Business Process Reengineering: Introduction –Approach to BPR Strategic Alignment Model BPR Methodology. Management of Change: Change Management in Public Administration The Implement Plan..		12 Hrs
V	Security Issues: Security Concerns - Security solutions - Electronic Cash over the Internet –Security and UN/EDIFACT Message - Internet Security – Guidelines for Cryptography Policy.		12 Hrs

Learning Resources	
Text Books	1. E-Commerce, The Cutting Edge of Business - Kamlesh K.Bajaj ,Debjani Nag Second Edition Tata Mc-Graw- Hill (Chapter 2,3,4,5,6,7,8,9,10,13,14).
Reference Books	1. E-Commerce Strategy, Technologies and Applications David Whiteley Tata Mc-Graw- Hill.
WebSites / Links	1. https://www.pearsonhighered.com/samplechapter/0131735160.pdf 2. https://florida.theorange grove.org/og/file/29589c3c-8bcd-72c1-b2f2-37789232eb3c/1/Electronic_Commerce.pdf 3. https://www.shopify.in/ecommerce-pdf.pdf

Content Beyond the Syllabus:

1. Legal issues(Risks: Paper Document vs. Electronic document, Authentication of Electronic document)
2. Business to Consumer E-Commerce(Consumer trade transaction, Internet)
3. Business to Consumer E-Commerce(Page on the Web, Elements of E-Commerce with VB, ASP, SQL)

Subject Title	Cloud Computing	Semester	VI
Subject Code	14U5CAE05	Specialization	NA
Type	Elective - II	L:T:P:C	5:0:0:5
Objectives: To impart the best concepts of Cloud, Platforms, security and its applications in various environments.			
Unit	Syllabus Contents	Number of Sessions	
I	Cloud computing: Introduction to Cloud Computing – history of cloud computing – client/server computing – peer-to-peer computing – distributed computing – collaboration computing – cloud computing – how cloud computing works: cloud storage – cloud architecture – cloud services – companies in the cloud – the pros and cons of cloud computing: advantages and disadvantages.	12 Hrs	
II	Evolution of cloud computing -Web service delivered from the cloud - Developing cloud services-Building cloud networks - Virtualization.	12Hrs	
III	Cloud Hardware and Infrastructure – Client – Security – Network – Services – Platforms. Cloud Solutions: introduction – Cloud Application Planning – Cloud Ecosystem – Cloud Business Process Management – Cloud Service Management: Key Cloud Solution Characteristics – on-premise Cloud Orchestration and Provisioning Engine – Computing On Demand (COD) – Cloud Sourcing.	12Hrs	
IV	Migrating to the Cloud: Cloud Services for individuals – Cloud Services Aimed at the Mid-Market – Enterprise-Class Cloud Offerings – Migration – Mobile Internet devices and the cloud - Best practices and the Future of Cloud Computing: Analyze your Service – Best Practices – How Cloud Computing Might Evolve.	12 Hrs	
V	Security in cloud: Overview-Cloud Security Challenges- Software as a Service – Common standards in cloud computing - Symmetric ciphers: Classical encryption techniques – Data Encryption Standard – Advanced Encryption Standard – Multiple Encryption and Triple DES. Asymmetric ciphers: Public-key cryptography and RSA – Cryptographic hash function – Message authentication code.	12 Hrs	

Learning Resources

Text Books	<ol style="list-style-type: none"> 1. "Cloud Computing web – based applications at change the way you work & collaborate online", Michael miller,pearson. 2. "Cloud Computing" 2nd edition, Dr.Kumarsaurabh,wiley India. 3. "Cloud Computing a practical approach", McGraw Hills. 4. Cloud Computing Implementation , Management, & Security "John W. Rittinghouse, James F . Ransome " Special Indian Edition.
Reference Books	<ol style="list-style-type: none"> 5. "Cryptography and Network Security" principles and practices – William Stallings. 5th Edition.
Web Sites / Links	<ol style="list-style-type: none"> 1. webojects.cdw.com 2. www.forbes.com 3. cloudcomputinglegal.weebly.com

Content Beyond the Syllabus:

1. Cloud computing services
2. Cloud computing models

Subject Title	PC Hardware And Trouble Shooting	Semester	VI
Subject Code	14U5CAE06	Specialization	NA
Type	Elective - II	L:T:P:C	5:0:0:5
Objectives:			
To understand history of computers, Identifying and Installing Zip Drives, Installing CD Media Drives, Installing and Configuring LAN.			
Unit	Syllabus Contents	Number of Sessions	
I	Your PC Revealed: History of Computers – Safeguarding PC – Components of PC. CPUs: Functions – Identifying Right CPU – Installing and Upgrading CPUs. RAM: Types of RAM – RAM Packages – Adding and Upgrading RAM. Motherboards and BIOS: Features – Types – Installing Motherboard. System BIOS.	12 Hrs	
II	Expansion Bus: Expansion Busses – Internal Buses – Installing a plug and Play Expansion Card – External Expansion Buses. Power Supplies and Cases: Case Form and Function – Power Supply – Cooling. Removable Media: Floppy Drives – Identifying and Installing Zip Drives – Modern Tape Drive Technologies – Tape Backup Strategies.	12 Hrs	
III	Hard Drives: How to store data – Installing hard drive – Configuring hard drive – Hard drive Maintenance and Troubleshooting. CD Media: CD Media Technologies – Installing CD Media Drives – Using CD Media – CD Media Troubleshooting.	12 Hrs	
IV	SCSI: SCSI Components – Different flavors of SCSI – Installing SCSI Devices – SCSI Troubleshooting. Video: Selecting Right Monitor – Selecting Right Video Card – Installing and Configuring Video Software – Maintenance and Troubleshooting. Input Devices: Installing Keyboard – Installing and Configuring Mouse – Identifying Less Common Input Devices.	12 Hrs	
V	Sound: How Sound works in a PC – Purchasing Right Sound Card – Installing Sound Card - Troubleshooting Sound. Printers: Identifying Printer Technologies – Installing Printer – Performing Basic Printer Maintenance – Recognizing and Fixing Basic Printing Problems. Networks: Installing and Configuring Dial-Up Network – Installing and Configuring LAN – Troubleshooting Basic Network Problems.	12 Hrs	

Learning Resources

Text Books	1. Mike Meyers, “Introduction to PC Hardware and Trouble shooting”, Tata McGraw-Hill, New Delhi, 2003.(Unit-I : Chapter 1,2,3&4, Unit-II: Chapter5,6&7, Unit –III : Chapter 8&9, Unit-IV : Chapter 10,11 & 12, Unit-V: Chapter 13,14&15).
Reference Books	1. Craig Zacker & John Rourke, “The complete reference:PC hardware”, Tata McGraw- Hill, NewDelhi, Second Edition 2007. B.Govindarajulu, “IBM PC and Clones hardware trouble shooting and maintenance”, Tata McGraw-Hill, New Delhi, Second Edition 2007. 2. Stephen J.Bigelow, “Trouble Shooting, maintaining and Repairing PCs”, Tata McGraw-Hill,NewDelhi, Second Edition 2003.
Website / Links	1. http://www.w3schools.com/php/php_mysql_intro.asp 2. http://www.tutorialspoint.com/mysql/mysql-php-syntax.htm 3. http://downloads.mysql.com/docs/apis-php-en.pdf 4. http://php.net/manual/en/book.mysql.php

Subject Title	DATA MINING AND WAREHOUSING	Semester	VI
Subject Code	14U4CAE08	Specialization	NA
Type	Elective -III	L:T:P:C	6 : 0 : 0 : 3

Objectives

To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with. To introduce the concept of data warehousing with special emphasis on architecture and design.

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Data Mining – Data Mining Functionalities – Kinds of Patterns can be Mined – Classification – Data Mining Task Primitives - Major Issues. Data pre-processing: Descriptive Data Summarization - Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and concept Hierarchy Generation.	12Hrs
II	Data warehouse and OLAP Technology: Data Warehouse – A Multidimensional Data Model – Data Warehouse Architecture – Data Warehouse Implementation – From data warehouse to data mining.	12Hrs
III	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts – Efficient and Scalable Frequent Itemset Mining Methods - Mining various kinds of Association Rules– From Association Mining to Correlation Analysis –. Constraint Based Association Mining. Classification and prediction: Issues regarding classification and prediction – Decision Tree Induction – Bayesian classification – Rule Based Classification - Classification by Back propagation – Prediction.	12Hrs
IV	Cluster Analysis: Types of Data in Cluster Analysis - A categorization of Major Clustering Methods - Partitioning Methods - Hierarchical Methods – Density Based Methods - Grid Based Methods - Model Based Clustering Methods – Outlier Analysis - Mining Time-Series Data – Mining Sequence Patterns in Biological Data.	12Hrs
V	Spatial Data Mining - Multimedia Data Mining – Text Mining -Mining the World Wide Web. Applications and Trends in Data Mining: Applications – Data Mining System Products and Research Prototypes – Additional Themes on Data Mining – Social Impacts of Data Mining – Trends in Data mining.	12Hrs

Learning Resources

Text Books	1. Jiwei Han, Michélie Kamber, “Data Mining Concepts and Techniques”, Morgan Kaufmann Publishers an Imprint of Elsevier, 2008. (Unit I: Chapter 1,2, Unit II: Chapter 3, Unit III: Chapter 5, 6, Unit IV: Chapter 7,8 Unit V: Chapter 10,11)
Reference Books	1. Soman K. P, Shyam Diwaker, V. Ajay, Data Mining, Printice Hall 2014. 2. Arun K. Pujari, “Data Mining Techniques”, Universities Press (India) Limited, 2014. 3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2014.
WebSite / Links	1. freevideolectures.com › Computer Science › IIT Madras 2. videolectures.net/is2011_grobelnik_warehouses/ 3. www.learnerstv.com/video/Free-video-Lecture-1636-Computer-Science 4. mydatamine.com/2011/04/top-10-data-mining-video-sites 5. www.slideshare.net/vivekjh/data-warehouse-modeling-presentation

Subject Title	Compiler Design	Semester	VI
Subject Code	14U5CAE09	Specialization	NA
Type	Elective -III	L:T:P:C	6 : 0 : 0 : 3

Objectives

To introduce the concept of compiler with in detail coverage of basic tasks, metrics, issues, and implication. To introduce the concept of Syntactic specification of programming languages.

Unit	Syllabus Contents	Number of Sessions
I	Introduction to Compilers: Compilers and Translator – Need of Translator – The structure of a Compiler – Lexical analysis – Syntax analysis – Intermediate code generation – Optimization – Code generation – Compiler writing tools. Finite automata and lexical Analysis: The role of the lexical analysis – A simple approach to the design of lexical analyzers- Regular expressions to finite automata – Minimizing the number of states of a DFA.	12Hrs
II	The Syntactic specification of programming languages: Context free grammars – Derivations and parse trees - Capabilities of context free grammars. Basic parsing techniques: Parsers – Shift reduce parsing – Operator precedence parsing – Top down parsing – Predictive parsers.	12Hrs
III	Syntax directed translation: Intermediate code – Postfix notation – Parse trees and syntax trees – 3 address code – Quadruples and triples – Boolean expressions – Statements that alter the flow of control. Symbol tables: The contents of a symbol table – Data structures for symbol table – Representing scope	12Hrs
IV	Run time storage administration: Implementation of a simple stack allocation scheme – Implementation of block-structured languages. Error deduction and recovery: Errors – Lexical phase errors – Syntactic phase errors – Semantic errors.	12Hrs
V	Introduction of code optimization: The principle sources of optimization – Loop optimization – The DAG representation of basic blocks – Global data flow analysis. Code generation: Object programs – Problems in code generation – A simple code generator – Register allocation and assignment – Code generation from DAG's – Peephole optimization.	12Hrs

Learning Resources	
Text Books	1. Principles of Compiler Design by Alfred V.Aho, Jeffrey D.Ullman , Narosa Publications House.
Reference Books	1.Modern Compiler Design by David Galles, Fifth Edition 2012.
Website / Links	1. http://www.w3schools.com/php/php_mysql_intro.asp . 2. http://www.tutorialspoint.com/mysql/mysql-php-syntax.htm 3. http://downloads.mysql.com/docs/apis-php-en.pdf 4. http://php.net/manual/en/book.mysql.php