SARVODAYA KELAVANI SAMAJ MANAGED,

SHREE MANIBHAI VIRANI & SMT. NAVALBEN VIRANI SCIENCE COLLEGE

AN AUTONOMOUS COLLEGE - AFFILIATED TO SAURASHTRA UNIVERSITY, RAJKOT

Re-accredited at the 'A' Level (CGPA 3.28) by NAAC
'STAR' College Scheme & Status by MST-DBT
A College with Potential for Excellence - CPE (Phase-II) by UGC
Accredited at the G-AAA Highest Grade 'A-1′ Level by KCG, Govt. of Gujarat
UGC-DDU KAUSHAL Kendra
GPCB-Government of Gujarat approved Environment Audit Centre

Board of Studies (BoS)

Department of Computer Science & Information Technology

COMPOSITION / AGENDA / NOTES / ATTENDANCE / MoM

Academic Year	Meeting Number	Date
2016-17	2	10/09/2016

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous), Rajkot
Affiliated to Saurashtra University, Rajkot

BOARD OF STUDIES – COMPUTER SCIENCE & INFORMATION TECHNOLOGY

Date: 10/09/2016   **Time: 11:00 am**   **Venue: Library Reading Room**

MINUTES OF THE MEETING

AGENDA:

1. Syllabi for **3rd & 4th semester** courses for following programmes for students admitted from **A.Y. 2016-17 & onwards**

    1.1 Bachelor of Computer Application (B.C.A)

    1.2 B.Sc. Information Technology

2. **Ratification** of Syllabi for **1st & 2nd semester** courses for M.Sc. Information Technology & Computer Application for students admitted from **A.Y. 2016-17 & onwards**

3. Syllabi for **5th & 6th semester** courses for B.Voc. Applied Computer Technology for students admitted from **A.Y. 2016-17 & onwards**

4. Syllabi for Generic Elective courses (Part-II) – Sem. V & VI for UG programmes for students admitted from **A.Y. 2016-17 & onwards**

5. Syllabi & evaluation norms for Part-III SEC-II - Co-curricular courses:

    5.1. Network Administration

    5.2 E-Marketing

6. Syllabi for Part-III SEC-III - Value-added courses:

    6.1 E-learning tools

    6.2 Desktop Data Publishing

7. Introduction of M.Phil. programme in Computer Science

8. Any other matter with permission of the chair.

BoS Members:

S.No.	Name	Designation	Present/Absent
1.	(Dr.) Stavan C. Patel	Chairperson	Present
2.	Dr. Kishor H. Atkotiya	Subject Expert, VC Nominee	Present
3.	(Dr.) Parag C. Shukla	Subject Expert, AC Nominee	Present
4.	Dr. Nilesh K. Padhariya	Subject Expert, AC Nominee	Absent
5.	Mr. Kalpesh K. Padhariya	Industry Expert	Present
6.	Mr. Hitendra N. Donga	Member	Present
7.	Ms. Nehal K. Dave	Member	Present
8.	Ms. Falguni I. Parasana	Member	Present
9.	(Dr.) Priyank D. Doshi	Member	Present

S.No.	Name	Designation	Present/Absent
10.	Ms. Priti D. Sadariya	Member	Present
11.	Ms. Rupal B. Parekh	Member	Absent
12.	Mr. Pradip G. Vanpariya	Member	Present
13.	Mr. Chirag I. Jagani	Member	Present
14.	Mr. Amit K. Patel	Member	Present
15.	Mr. Jignesh D. Hirpara	Member	Present
16.	Dr. Pratik A. Vanjara	Member	Present
17.	Mr. Haresh D. Khachariya	Member	Present
18.	Ms. Miral K. Kothari	Member	Present
19.	Mr. Hiren R. Kavathiya	Member	Present
20.	Mr. Divyesh P. Gohel	Member	Present
21.	Ms. Shital M. Chaniyara	Member	Present
22.	Mr. Prakash P. Gujarati	Member	Present
23.	Ms. Ripal D. Ranpara	Alumni Representative	Present

The BoS in Computer Science & Information Technology met as indicated above, and discussed on the above Agenda.

All the members appreciated the initiatives for curriculum development. Sharing their expertise with proactive inputs, they deliberated on the agenda and unanimously resolved the following as appended are to be recommended to Academic Council for approval for students admitted from **AY 2016-2017 & onwards:**

1. **Syllabi for 3rd & 4th semester courses for following programmes for students admitted from A.Y. 2016-17 & onwards**

    The Syllabi were framed for the courses of the **3rd & 4th semesters** of the following Programmes for students admitted from **A.Y. 2016-17 & onwards**

    1.1 Bachelor of Computer Application (B.C.A.) – **Enclosure –I A**
    1.2 B.Sc. Information Technology - **Enclosure –I B**

2. **Ratification of Syllabi for 1st & 2nd semester courses for M.Sc. Information Technology & Computer Application for students admitted from A.Y. 2016-17 & onwards**

    Based on the authorization given to the Chairman of the BoS, in the meeting of BoS held on 22/04/2016, the Syllabi of the courses of the **1st & 2nd semesters** of **M.Sc. Information Technology & Computer Application** were **ratified** for students admitted from **A.Y. 2016-17 & onwards - Enclosure –II**

3. **Syllabi for 5th & 6th semester courses for B.Voc. Applied Computer Technology for students admitted from A.Y. 2016-17 & onwards**

    The Syllabi for courses of **5th and 6th Semesters** of B.Voc. Applied Computer Technology was recommended to be kept same as per UGC's & SU's approval for students admitted from **A.Y.2016-17 & onwards - Enclosure –III**

4. **Syllabi for Generic Elective courses (Part-II) – Sem. V & VI for UG programmes for students admitted from A.Y. 2016-17 & onwards**

The Syllabi framed for the Generic Elective courses (Part – II) – Sem. V & VI for the UG programmes for students admitted from **A.Y. 2016-17 & onwards**
- **Enclosure –IV**

4.1 Cyber Security
4.2 Emerging Information Technologies

5. **Syllabi & evaluation norms for Part-III SEC-II - Co-curricular courses**
Syllabi & Evaluation norms were framed for above, for the following
- **Enclosure – V A**

Sr. No.	Course	Duration	Credit	Semester
1	Network Administration	80 hrs	1	II to V
2	E-Marketing	80 hrs	1	

6. **Syllabi for Part-III SEC-III - Value-added courses**
The above were framed for the following courses - **Enclosure – V B**
6.1 E-learning tools
6.2 Desktop Data Publishing

7. **Introduction of M.Phil. programme in Computer Science**

Considering the need and importance of research in the field of Computer Science and to pursue doctorate programme to fulfill the need of experts in academic Institutions, all the members of BoS recommended introduction of M.Phil. programme in Computer Science.
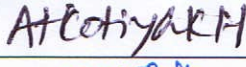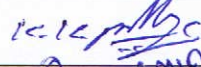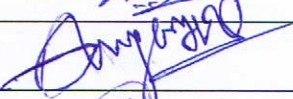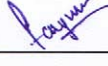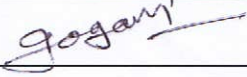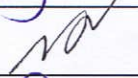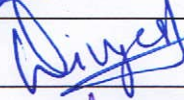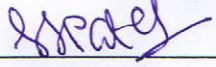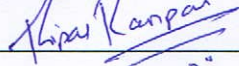
8. **Any other matter with permission of the chair.**

Sem-I & Sem-II of Bachelor of Computer Application (B.C.A.) and B.Sc. Information Technology fulfills the eligibility requirements for obtaining the CCC (Course on Computer Concepts) and CCC+ (Course on Computer Concepts Plus) certificates respectively.

With the permission of the Chair and after discussion amongst BoS members, the members recommend the following:

'After successfully passing all the subjects of semester – I of Bachelor of Computer Application (B.C.A.) / B.Sc. Information Technology candidate will be awarded by certificate CCC (Course on Computer Concepts) and after passing all the subjects of Semester – I and Semester – II of Bachelor of Computer Application (B.C.A.) / B.Sc. Information Technology candidate will be awarded by certificate CCC+ (Course on Computer Concepts Plus)'

(Dr.) Stavan C. Patel ended the meeting after vote of thanks.

S.No.	Name of Member	Signature
1.	(Dr.) Stavan C. Patel	
2.	Dr. Kishor H. Atkotiya	
3.	(Dr.) Parag C. Shukla	
4.	Dr. Nilesh K. Padhariya	— ABSENT —
5.	Mr. Kalpesh K. Padhariya	
6.	Mr. Hitendra N. Donga	
7.	Ms. Nehal K. Dave	
8.	Ms. Falguni I. Parasana	
9.	(Dr.) Priyank D. Doshi	
10.	Ms. Priti D. Sadariya	
11.	Ms. Rupal B. Parekh	— ABSENT —
12.	Mr. Pradip G. Vanpariya	
13.	Mr. Chirag I. Jagani	
14.	Mr. Amit K. Patel	
15.	Mr. Jignesh D. Hirpara	
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Department of Computer Science & Information Technology
BACHELOR OF COMPUTER APPLICATION (B.C.A.)

SEMESTER - III

16UCACC10	Core 6: Object Oriented Programming with JAVA	4 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concepts and techniques of the object oriented programming paradigm
2. Learn the Java programming language: its syntax, idioms, patterns, and styles
3. Understand Inheritance and Polymorphism using Java
4. Understand concept of Exception handling and multiple threading with Java
5. Understand event driven Graphical User Interface (GUI) programming using Java

Unit -1 Java Language Basics **(10 hrs)**

- Basic Concepts of OOP
  - Class, Object, Inheritance, Encapsulation, Abstraction
- Difference between OOP and POP
- History and Features of Java
- Java Editions, Java Virtual Machine
- Language Building Blocks of Java
  - Comments, Keywords, Identifiers, Literals, Tokens, White spaces, Separator
- Data Types & Variables, Type Casting, Operators
- Decision Statements (if, switch), Looping Statements (for, while, do..While, foreach), Jumping Statements (break, continue, and return)
- Array, Command Line Argument Array
- Classes and Objects
  - Creating and using Class with members
  - Constructor, Constructor overloading
  - Use of finalize( ) method
  - Method Overloading
  - Static and Non-Static Members, VarArgs.

Unit -2 Packages and Inheritance   **(10 hrs)**

- Normal import and Static Import
- Introduction to Java API Packages and imp. Classes, java.lang Package Classes (Math, Wrapper Classes, String, String Buffer), java.util Package Classes (Scanner, Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer)
- Creating and Using User Defined package and sub-packages, Universal Class (Object Class)
- Concept of Inheritance
    - o Types of Inheritance and types with Java
    - o Access Specifiers (public, private, protected, default, private protected)
    - o Constructors in inheritance with super keyword
- Method Overriding,
- Nested and Inner Class, Abstract and final keyword, Use of Interface.

Unit – 3 Exception Handling, Multithreading and Streams   **(10 hrs)**

- Types of Errors, Introduction to exception handling, Keywords: try, catch, finally, throw, throws, Creating user defined Exception
- Multithreading: Thread and its Life Cycle (Thread, States), Thread Class and its methods, Synchronization in Multiple Threads
- Stream and its types: Character, Byte, Reading and Writing through Byte Stream Classes, Character Stream Classes, Reading and Writing through Byte Stream Classes, Reading and Writing through java data types, use of StreamTokenzier and Random Access File.

Unit – 4 Applet with Layouts Manager and AWT components: Applets   **(10 hrs)**

- Introduction to Applet, Applet Life Cycle, Implement & Executing Applet with Parameters, Graphics class
- Layout Manager: FlowLayout, BorderLayout, CardLayout, GridLayout, GrigBagLayout, BoxLayout, SprigLayout, GroupLayout, Using NO LAYOUT Manager
- AWT components (Button, Label, Checkbox, CheckboxGroup, Choice, List, TextField, TextArea, Scrollbar)
- AWT Containers: Frame and Panel

Unit – 5 Event Handling and GUI using Swing   **(10 hrs)**
- Concept of Event Handling, Event Delegation Model, Event Packages, AWT Event Package, Event Classes, Listener Interfaces, Concept Adaptor Classes.
- Swing: Introduction to Swing, difference Between AWT and, Swing Components, Swing Container, Swing Event Package.

Text Books
1. *A. Balaguruswamy,* 1999, **Programming with JAVA A Primer**, McGraw Hill
2. *Naughton & Herbert Schildt,* **JAVA 2: The Complete Reference***,* McGraw Hill

Reference Books

1. *Steven Holzner, 2005,* **JAVA 2 Black Book**, Dreamtech Press
2. *Khalid A. Mughal* , 2009, **A Programmer Guide to JAVA Certification**, Pearson Education
3. *Mitesh P. Mandaliya, Ms. Rupal B. Parekh*, Programming with JAVA, C. Jamnadas & Co.

16UCACC11	Core 7: RDBMS using Oracle	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concept of database
2. Building Entity Relationship Diagrams (ERDs) and mapping ERDs
3. Manipulate data in tables and create database objects
4. Analyze complex business scenarios, design and create databases using SQL
5. Create PL/SQL blocks of application code that can be shared by multiple forms, reports and data management applications
6. Describe stored procedures and functions
7. Explore the differences between SQL and PL/SQL and explore how PL/SQL is used to extend and automate SQL in administering the Oracle database

Unit -1 Overview of DBMS, RDBMS and Understanding SQL   (10 hrs)

- Introduction to DBMS, RDBMS Concept
- Importance of E.R Diagram in Relational DBMS
- Normalization
- Introduction to SQL
- SQL Datatypes
- Introduction to SQL*PLUS and its formatting commands
- Creating , Altering & Dropping Table Structures

Unit -2 Managing Table and Accessing Data   (10 hrs)

- Data Manipulation Commands like Insert, Update, Delete
- SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT,
- Special operator like IN, ANY, ALL, BETWEEN, LIKE, IS NULL
- JOINS (Inner join ,outer join, self join)
- Subquery (Single row subquery, multiple row subquery)
- Built in Functions
    - o Numeric Function
      Abs, ceil, decode, floor, round, mod, sqrt
    - o Character Function
      chr, concat, initcap, lower, upper, lpad, rpad, ltrim, replace, rtrim, substr, instr, trim
    - o Date Function
      last_day, months_between, next_day, sysdate, systimestamp, to_date, to_char, to_number
    - o Aggregate functions
      SUM, COUNT, AVG, MAX, MIN

Unit – 3 Understanding other SQL Objects, Data & Transactional Control Commands, and Concurrency Control using LOCKs   (10 hrs)

- Other Database Objects:
    - View, Sequence, Synonym, Database Link, Index
- Grant, Revoke command
- Understanding Transaction and its commands: Commit, Rollback, Savepoint
- Understanding Locking Mechanism

Unit – 4 PL/SQL   (10 hrs)

- PL/SQL Block Structure
- Control Structures:
    - Conditional Statement
    - Looping Statement
    - Sequential Statement
- %TYPE and %ROWTYPE
- Using Cursor(Implicit, Explicit)
- Exception Handling
- Creating and Using Procedure, Function
- Package
- Triggers
- Composite Data Types:
    - PL/SQL Tables, Nested Tables, Varrays

Unit – 5 Oracle Architecture, Backup & Recovery   (10 hrs)

- Oracle Architecture
    - Physical Database Structure
    - Instance/Memory Architecture
    - Background Database Processes
- Creating & Altering Database
- Opening & shutdown Database
- Overview of Tablespace
- Oracle Blocks, Extent, Segments
- Import, Export
- SQL*Loader, NET8
- Overview of Backup & Recovery

Text Books
1. *Ivan Bayross,* **SQL, PL/SQL the programming Language of Oracle**, BPB Publications
2. *George Koch, Kevin Loney*, **Oracle 10g the Complete Reference**, Oracle Press and Tata MacGraw-Hill

Reference Books
1. *P.S. Deshpande*, 2006, **SQL and PL/SQL for Oracle 10g Black Book**, Dreamtech Press
2. *Ms. Falguni I. Parsana,* **RDBMS Using Oracle,** Bharat & Company, [ISBN : 978-93-81786-38-3]

16UCACC12	Core 8: Operating System Concept with Unix/Linux	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concepts of operating system and Design algorithms of process and memory management
2. Understand the overview of Unix operating system and commands
3. Learn shell programming
4. Understand the overview of Linux configuration and features
5. Handling of Linux server administration

Unit -1 Introduction   (10 hrs)

- Meaning of OS
- Functions of OS
- OS Types
- Introduction of OS process
- Process State Transition Diagram
- Process Scheduling
    - o FCFS, SJN, Round Robin, Priority Base Non Preemptive, Priority Base Preemptive
- Physical Memory and Virtual Memory
- Memory Allocation
    - o Contiguous Memory Allocation
    - o Non contiguous Memory Allocation
- Paging

Unit -2 Getting Started with UNIX command   (10 hrs)

- Unix Architecture
- Unix Features
- Types of Shell (C, Bourn, Korn BASH)
- Unix File System,
- Unix File & Directory Permissions
- Connecting Unix Shell : Telnet
- Login Commands : passwd, logout, who, who am i, clear
- File / Directory Related Command : ls, cat, cd, pwd, mv, cp, ln, rm, rmdir, mkdir, umask, chmod, chown, chgrp, find, pg, more, less, head, tail, wc, touch
- Operators in Redirection & Piping
- Advance Tools
- Finding patterns in files : grep, fgrep, egrep
- Working with columns and fields : cut, paste, join
- Tools for sorting : sort, uniq
- Comparing files : cmp, comm., diff
- Changing information in files : tr, sed

- Examining file contents : od
- Tools for mathematical calculations : bc, factor
- Monitoring Input and Output : tee, script
- Tools for displaying date and time : cal, date
- Communications : telnet, wall, mtod, write, mail, news, finger
- Process related commands : ps
- command to run process in background : nice, kill, at, batch, cron, crontab, wait, sleep
- Concept of Mounting and DeMounting a File System
  - mount command, umount command

Unit – 3 Shell Programming   **(10 hrs)**
- Introduction of vi editor
- Modes in vi
- various command
- Shell Keywords
- Shell Variables
- System variables\
  - PS2, PATH, HOME, LOGNAME, MAIL, IFS, SHELL, TERM, MAILCHECK
- User variables
  - set, unset and echo command with shell variables
- Positional Parameters
- Interactive shell script using read and echo
- Decision Statements
  - if then fi
  - if then else fi
  - if then elif else fi
  - case esac
- test command
- Logical Operators
- Looping statements
  - for loop
  - while loop
  - until loop
  - break, continue command
- Arithmetic in Shell script
- Various shell script examples

Unit – 4 Getting Started with Linux   **(10 hrs)**
- Structure and Features of Linux
- Installation and Configuration of Linux - Using with Ubuntu
- Desktop Environment
- Creating Linux User Account and Password
- Install / Uninstall Software

Unit – 5 Linux Admin (Ubuntu) (10 hrs)

- Installing and Managing Samba Server
- Installing and Managing Apache Server
- Optimizing LDAP Services
- Optimizing DNS Services
- Optimizing FTP Services
- Optimizing Web Services
- Configure Ubuntu's Built-In Firewall
- Working with WINE

Text Books

1. *Silberschatz, Galvin, Gagne*, 2009, **WileyOperating System Concepts:8th Edition Wiley Student Edition,** Wiley
2. *Yashavant P. Kanetkar*, 2003, **Unix Shell Programming**, BPB Publications

Reference Books

1. *Sumitabha Das*, 2006, **Unix concepts and applications,** McGraw Hill Education

16UCADA03	DSE Allied 3: Web and M-Commerce Technologies	04 hrs/wk	4 Credits

Objectives:

To enable the students to
1. Understand applications of mobile phones for various marketing disciplines
2. Understand the interrelationships between two media channels – mobile and social and how brands can engage consumers through these channels
3. Develop a strategic approach to define how mobile phones can be aligned and integrated into an overall marketing strategy in organizations
4. Establish a framework for corporate financial decisions
5. Understand major decisions, objective function of the firm and major tools available to fact the decision making process to achieve objective function of firm

Unit -1 Electronic Commerce   **(10 hrs)**
- Traditional commerce and E-commerce, Internet and WWW, Role of WWW
- Value Chains, Strategic Business and Industry Value Chains, Role of E-commerce
- Evolution of E-commerce: Introduction, History of Electronic Commerce, Advantages and Disadvantage of E-commerce, Roadmap of e-commerce in India
- Web Based Tools for E-commerce – Security

Unit -2 Introduction Mobile Commerce and Mobile Marketing   **(10 hrs)**
- What is mobile marketing and m-commerce?
- How does M-Commerce Work?
- Benefits of M-Commerce
- Infrastructure of M–Commerce, Types of Mobile Commerce Services
- Technologies of Wireless Business – Benefits and Limitations, Support, Mobile Marketing & Advertisement
- Differences between fixed Internet e-Commerce and m-Commerce

Unit -3 Mobile Commerce: Technology & Security   **(10 hrs)**
- A Framework for The Study of Mobile Commerce – NTT Docomo's I-Mode
- Wireless devices for Mobile Commerce – Towards a classification framework for Mobile Location Based Services – Wireless Personal and Local Area Networks
- A managerial overview of 2G, 3G, 4G technologies
- A managerial overview of WiFi – Hifi - Lifi (IEEE802.11)
- Web Based Tools for E-commerce – Security

Unit – 4 Mobile Commerce: Theory and Applications   **(10 hrs)**
- Mobile Portals, Mobile Infotainment Services, Mobile Ticketing, Mobile Banking, Mobile Advertising, Mobile e-Tailing, A Closer look at i-Mode and other successful services Mobilizing enterprise applications
- E–commerce in the Automotive Industry – Location– Based Services: Criteria for Adoption and Solution Deployment

- The role of mobile advertising in building a brand – M–commerce Business Models

Unit – 5 Business– to– Business Mobile E– Commerce   (10 hrs)
- Enterprise Enablement – Email and Messaging – Field Force Automation (Insurance, Real Estate, Maintenance, Healthcare) – Field Sales Support (Content Access, Inventory) – Asset Tracking and Maintenance/Management – Remote IT Support
- Customer Retention (B2C Services, Financial, Special Deals) – Warehouse Automation – Security.

Text Books
1. *E.Brian Mennecke, J.Troy Strader,* 2003, **Mobile Commerce: Technology, Theory and Applications***,* Idea Group Inc., IRM press
2. *Ravi Kalakota, B.Andrew Whinston,* 2003*,* **Frontiers of Electronic Commerce***,* Pearson Education

Reference Books
1. *P. J. Louis*, 2001, **M-Commerce Crash Course***, McGraw- Hill Companies*
2. *Paul May,* 2001, **Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business**, Cambridge University Press March
3. *Norman Sadeh,* (2002), **M-Commerce, Technologies, Services and Business Models,** John Wiley & Sons

16UCACC13	**Core Practical 5:** **Object Oriented Programming with JAVA Practical**	**04 hrs/wk**	**02 Credits**

- Practical based on JAVA Programming Language

16UCACC14	**Core Practical 6 :** **RDBMS using Oracle Practical & Operating System Concept with Unix/Linux** **Practical**	**04 hrs/wk**	**02 Credits**

- Practical based on Oracle
- Practical based on Unix/Linux

16UCACC15	Core 9: Programming with C#.NET	04 hrs/wk	4 Credits

Objectives:

To enable the students to
1. Understand the .NET Framework
2. Understand the foundation of C# programming
3. Possess the understanding of OOP in C#.NET
4. Understand different application of ADO.NET
5. Design Crystal Reports and Create Setup of C# Application

Unit -1 .NET Framework (10 hrs)
- Introduction to .NET Framework Features / Advantages
- MS .NET Architecture
- Types of Projects in IDE (Console, Windows, Web, Setup, etc.)
- Components of the .NET Architecture:
    o Common Language Runtime
    o Common Type System
    o Common Language Specification
    o Base Class Library
    o CTS and CLS BCL / FCL CLR,JIT Compiler
    o Microsoft Intermediate Language
    o Managed/Unmanaged Code
    o Garbage Collection
    o Assembly
    o Namespaces

Unit -2 C# Basics (10 hrs)
- Basic Variables, Declaring Variables
- Data types in C#
- Creation of C#
- First simple Program
- Compilation and Execution
- Type Conversion and casting, Boxing and Unboxing
- Operators in C#
- Decision Making Statements (If-else, Switch)
- Looping (For, While, Do-while, For-each)
- Jumping statement (Break, Continue, Goto)
- Structure, Enumeration
- Arrays (One Dimensional, Rectangular, Jagged)
- Exception Handling

Unit – 3 OOP   (10 hrs)

- Classes and Objects, Encapsulation and Polymorphism
- Access modifiers
- Methods and it's parameters (with "ref" and "out" parameters)
- Method Overloading, Overriding Methods
- Inheritance
- Sealed Class, Abstract Class and Interface
- Properties and Indexer, Delegates and Events

Unit – 4 Working With GUI   (10 hrs)

- Different components (windows) of IDE
- Working with Forms Class
  - Loading, showing and hiding forms, Controlling One form within another, MDI Form.
- Message Box class with all types of Show () method
- Windows Form Controls.
- Standard Controls:
  - Textbox, Label, Button, List box
  - Combo box, Checkbox, Picture Box
  - Radio Button, Panel, Scroll-bar
  - Timer, Datetimepicker, Notify Icon
  - Image List, Link Label, List View
  - Tree View, Toolbar, Status Bar
  - OpenFileDialog, SaveFileDialog
  - Font Dialog, Color Dialog, Print Dialog
- Designing Menu's: Context Menu, Menu Strip, Status Strip, Tool Strip
- Adding Third Party Control in Toolbox

Unit – 5 Database Programming With ADO.NET   (10 hrs)

- ADO.NET Architecture
- Connected and Disconnected Architecture
- Connected Architecture
  - Command
  - Data Reader
- Disconnected Architecture
  - Data Adapter
  - Dataset
  - data Table
  - Data Row
  - Data Column
  - Data Relation
  - Data View

- Data Binding
- Grid View Programming
- Creating Crystal Reports
- Types of Setup Projects
- Creating Setup Project
  - File System Editor
  - User Interface Editor
  - Launch Conditions Editor

Text Books
1. *Steven Holzner*, **C#.NET Programming Black Book**, dreamtech publications
2. *Rebecca M. Riordan,* **Microsoft ADO. Net** , Microsoft Press

Reference Books
1. **Introduction to .NET framework**, Wrox publication
2. **Programming with C#**, Bharat & Co. [ISBN : 978-93-81786-41-3]
3. **Programming with C#.net**, C. Jamnadas & Co. [ISBN : 978-93-81072-64-6]

16UCACC16	Core 10: Web Development using PHP	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concepts of scripting language and web programming
2. Understand how to implement, dry-run and debug programs.
3. Recognize the benefits of using server side scripting
4. Become equipped to make good choices about model design and use of open source scripting PHP
5. Learn how to build and maintain php websites
6. Understand how to write php scripts and use webserver
7. Understand the concept of client-server architecture

Unit -1 Introduction (10 hrs)

- Introduction of webpages and website
- Static and Dynamic Web
- Client side & Server Side Scripting
- Webserver (IIS & Apache-XAMPP)
- HTTP & HTTPS protocol
- FTP
- Web Hosting, Virtual Host, Multi-Homing
- Distributed Web Server Overview,
- Document Root
- Introduction to PHP
- PHP configuration in IIS & Apache Web server
- Understanding of PHP.INI file
- Understanding of PHP.ht access file
- PHP Variable
    - o Static & global variable
- GET , POST & REQUEST method
- PHP Operator
- Conditional Structure & Looping Structure

Unit -2 Array and Function (10 hrs)

- Array
- User Defined Functions:
    - o argument function
    - o default argument
    - o variable function
    - o return function
- Variable Length Argument Function
    - o func_num_args
    - o func_get_arg,

- o func_get_args
- Variable Function
  - o Gettype, settype, isset, unset,empty, strval, floatval, intval, print_r
- String Function
  - o Chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim trim, substr, strcmp, strops, strrpos, strstr, str_replace, strrev, echo, print, explode(), implode(), md5(), substr_compare(), substr_count(), ucfirst(), ucwords()
- Math Function
  - o Abs, ceil, floor, round, fmod, min,
  - o max, pow, sqrt, rand, cos(),
  - o acos(), sin(), asin(), tan(), atan(),
  - o dechex(), is_finite(), is_infinite(),
- Date Function
  - o Date, getdate, setdate
  - o Checkdate, time, mktime
  - o date_add(), date_create()
  - o date_format(), gmdate()
  - o localtime(), strftime(), strptime(), strtotime()
- Miscellaneous Function
  - o define, constant, include,
  - o require, header, die, exit, GD Library

Unit – 3 Handling Form and Files & Session tracking   (10 hrs)

- Handling form with GET, POST & REQUEST
- Array Function
  - o Count, list, in_array, current,
  - o next, previous, end, each, sort,
  - o rsort, assort, arsort, array_merge,
  - o array_reverse, array_diff(),
  - o array_merge_recursive(),
  - o array_shift(), array_slice(),
  - o array_unique(), array_unshift(),
  - o array_keys(), array_key_exists(),
  - o array_push(), array_pop(),array_multisort(),array_search()
- Cookies
- Session
- Server variables
- PHP Regular expression.
- PHP file Uploading
- File handling Function
  - o fopen, fread, fwrite, fclose,
  - o file_exists, is_readable,
  - o is_writable, fgets, fgetc, file,

- o file_get_contents, fputcsv, fputs,
- o file_putcontents, ftell, fseek,
- o rewind, copy, unlink, rename,
- Sending mail using mail() using php mailer

Unit – 4 Interacting with MySQLi   (10 hrs)
- Working with MySQLi using PhpMyAdmin
- PHP-MySQLi Connectivity and Debug functions
  - o mysqli_connect(), mysqli_set_charset()
  - o mysqli_character_set_name(), mysqli_select_db()
  - o mysqli_close(), mysqli_errno()
  - o mysqli_error_list(), mysqli_error()
  - o mysqli_connect_errno(), mysqli_connect_error()
  - o mysqli_get_charset(), mysqli_get_client_info()
  - o mysqli_get_client_version(), mysqli_get_host_info()
  - o mysqli_get_server_info(), mysqli_get_server_version() ,
  - o mysqli_debug()
- PHP-MySQLi Functions
  - o mysqli_affected_rows(), mysqli_autocommit()
  - o mysqli_commit(), mysqli_data_seek()
  - o mysqli_fetch_all(), mysqli_fetch_array()
  - o mysqli_fetch_assoc(), mysqli_fetch_fields()
  - o mysqli_fetch_object(), mysqli_fetch_row()
  - o mysqli_field_count(), mysqli_field_seek()
  - o mysqli_free_result(), mysqli_insert_id()
  - o mysqli_kill(), mysqli_multi_query()
  - o mysqli_num_fields(), mysqli_num_rows()
  - o mysqli_query(), mysqli_real_escape_string(),mysqli_rollback()

Unit – 5 Advance PHP with OOPS   (10 hrs)
- PHP with OOPS
  - o Class,
  - o Constructor,
  - o Inheritance,
  - o Serialize objects
  - o Database Handling with OOPS
  - o Connection class using OOP
- PHP with AJAX
  - o What is AJAX?
  - o How AJAX Works with PHP
  - o Working with Ajax as Background Process
- JQuery
  - o What is JQuery?
  - o How JQuery Works and how it is created.
  - o Using JQuery with PHP and ajax

Text Books

1. *Ed Lecky-Thompson, Heow Eide-Goodman,* 2004, **Professional PHP5**, Wiley India Pvt. Ltd.
2. *Lynn Beighley*, Michael Morrison, 2009, **Head First PHP & MySQL (A Brain-Friendly Guide)**, O′Reilly

Reference Books
1. *David Powers*, 2013, **PHP Object-Oriented Solutions**, Apress
2. *Keith Wald, Jason Lengstorf*, 2016, **Pro PHP and jQuery**, Apress

16UCACC17	Core 11: System Analysis & Design	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concepts of system study and system analysis
2. Understand importance of each phase in System Development Life Cycle
3. Understand importance of Software Development Paradigm (Models)

Unit -1 System Study and System Development Life Cycle   (10 hrs)

- System, System Types, System Characteristics, System Study, System Approach, Elements of System Analysis, Role and Attribute of System Analyst, Program Analyst, Designer, Information Analyst, Computer Based Information System. Why System Projects?
- System Development Life Cycle
  - o Understanding Activities of Each Phase
  - o Outcome and Deliverable with Document name of each phase
- Fact Finding Techniques.
- Understanding Concepts of UML and Designing charts (Class, User Case and Activity) based on it.

Unit -2 Introduction of Software Engineering and Software Development Models
**   (10 hrs)**

- Software Engineering : A Layered Technology.
- Software Process and Software Process Models.
  - o Waterfall Model
  - o Iterative Model
  - o V-Model
  - o Spiral Model
  - o Big Bang Model
  - o Prototyping Model

Unit -3 Computers Aided Software Engineering Tools in Project Management.
**   (CASE tools)   (10 hrs)**

- Drawing Data Flow Diagram using MS Visio.
- User Interface Flow Diagram.
- Concept of Project Management
- Function Point and LOC based Metrics.
- Concept of Project Scheduling and Tracking.
- Timeline chart and Pert chart in MS Project.

Unit – 4 Software Quality Assurance and Testing   **(10 hrs)**

- ISO and Six Sigma for Quality Assurance.
- Introduction to software Testing
    - Software faults and failures
    - Bug/Error/Defect/Faults/Failures
    - Testing Artifacts
    - Test case
    - Test Script
    - Test Plan
    - Test Harness
    - Test Suite
- Static Testing
    - Informal Review
    - Walkthrough
    - Technical Review
    - Inspection
- Dynamic Testing, Testing Levels and Techniques of each Level.
    - Level: Unit Testing, Integration and System Testing.
- Automated Testing using (any freeware or open source) software testing tools.

Unit – 5 Case Study according to SDLC   **(10 hrs)**

- Student has to prepare synopsis with deep study of system according to phase first, second and third of SDLC.
- Get approval of your Subject Teacher for your work.

Text Books

1. *Priyank Doshi,* **SAD, Software Quality Assurance and Testin**g, Bharat & Co. , [ISBN : 978-93-81786-36-9]
2. Roger S Pressman, **Software Engineering – A Practitioner's Approach**, McGraw Hill

Reference Books
3. *James A. Senn,* 2008, **Analysis & Design of Information System,** McGraw Hill
4. *Rajib Mall*, 2009, **Fundamentals of Software Engineering**, Prentice Hall India Learning Private Limited
5. *Jasson Roff*, 2003, **UML:A Beginner's Guide**, McGraw Hill

16UCADA04	DSE Allied 4: User Interface and User Experience Practical	4 hrs/wk	2 Credits

Objectives:

To enable the students to

1. Understand concepts, techniques, practices, workflows, and tools associated with the practice of user experience design in web and mobile experiences
2. Develop an appreciation for the use of storytelling as a means of designing and evaluating user experience
3. Use techniques for evaluate a user interface design
4. Prototyping, low-fidelity design, and implementation of first
5. Describe a proven, user-centric design framework that supports end-to-end usability involvement in web projects
6. Learn different methods for usability testing web sites and when to apply them

Unit -1 UI & UX Introduction (10 hrs)

- What is User Interface?
- User interface design for the mobile app & web app
- Different Devices & Display size
- User Interaction with the products, applications and services – Cognitive Model/Mental Model
- Why User Experience Design
- What is User Experience (UX) Design?
- Core elements of User Experience. How these elements work together

Unit -2 UI Design & UX Design Process (10 hrs)

- Defining the UX Design Process and Methodology
- Wireframes, Personas, Mind-mapping, Mental models, Prototyping, Card sorting, Eye-tracking, Use cases, User profiling, Interaction design, Information architecture, Content writing, Customer journey maps, UX design and usability testing tools, Customer experience evaluation.

Unit – 3 UX Design Process: Research & Define & Iterate/ Improve (10 hrs)

- Why Research is critical?
- Research methods and tools.
- Understanding the User Needs and Goals, Understanding the Business Goals
- Hands-on Practices different tools
- Understanding the Usability Test findings Applying the Usability Test feedback in improving the design

Unit – 4 UX Design Process: Ideate/Design (10 hrs)

- Visual Design Principles
- Information Design and Data Visualization
- Interaction Design Information Architecture
- Wire-framing & Story barding
- UI Elements and Widgets
- Screen Design and Layouts
- Hands-on Practices different tools

Unit – 5 UX Design Process: Prototype & Test & Deliver (10 hrs)

- Why Test your Design?
- What is Usability Testing?
- Types of Usability Testing
- Usability Testing Process
- How to prepare and plan for the Usability Tests?
- Prototype your Design to Test?
- Introduction of Prototyping tools
- How to conduct Usability Test?
- How to communicate Usability Test Results?
- Communication with implementation team UX Deliverables to be given to implementation team

Text Books
1. *Jesse James Garrett*, 2010, **The Elements of User Experience: User-Centred Design for the Web,** New Riders
2. *Elizabeth Goodman, Mike Kuniavsky, Andrea Moed*, 2012, **Observing the User Experience: A Practitioner's Guide to User Research**, Morgan Kaufmann
3. *Dorian Peters*, 2013, Interface **Design for Learning: Design Strategies for Learning Experiences (Voices That Matter)**, New Riders

Reference Books
1. *Emrah Yayici*, 2014, **UX Design and Usability Mentor Book: With Best Practice Business Analysis and User Interface Design Tips and Techniques**, Emrah Yayici
2. Jenifer Tidwell, 2011,**Designing Interfaces [2nd Edition]**, Shroff/O'Reilly

16UCACC18	Core Practical 7: Programming with C#.NET Practical	04 hrs/wk	02 Credits

- Practical based on C#.NET

16UCACC19	Core Practical 8: Web Development using PHP Practical	04 hrs/wk	02 Credits

- Practical based on PHP

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Department of Computer Science & Information Technology
B.Sc. INFORMATION TECHNOLOGY

SEMESTER - III

16UITCC10	Core 6: Object Oriented Programming with JAVA	4 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concepts and techniques of the object oriented programming paradigm
2. Learn the Java programming language: its syntax, idioms, patterns, and styles
3. Understand Inheritance and Polymorphism using Java
4. Understand concept of Exception handling and multiple threading with Java
5. Understand event driven Graphical User Interface (GUI) programming using Java

Unit -1 Java Language Basics   **(10 hrs)**

- Basic Concepts of OOP
  - Class, Object, Inheritance, Encapsulation, Abstraction
- Difference between OOP and POP
- History and Features of Java
- Java Editions, Java Virtual Machine
- Language Building Blocks of Java
  - Comments, Keywords, Identifiers, Literals, Tokens, White spaces, Separator
- Data Types & Variables, Type Casting, Operators
- Decision Statements (if, switch), Looping Statements (for, while, do..While, foreach), Jumping Statements (break, continue, and return)
- Array, Command Line Argument Array
- Classes and Objects
  - Creating and using Class with members
  - Constructor, Constructor overloading
  - Use of finalize( ) method
  - Method Overloading
  - Static and Non-Static Members, VarArgs.

Unit -2 Packages and Inheritance   **(10 hrs)**

- Normal import and Static Import
- Introduction to Java API Packages and imp. Classes, java.lang Package Classes (Math, Wrapper Classes, String, String Buffer), java.util Package Classes (Scanner, Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer)
- Creating and Using User Defined package and sub-packages, Universal Class (Object Class)
- Concept of Inheritance
  - Types of Inheritance and types with Java
  - Access Specifiers (public, private, protected, default, private protected)
  - Constructors in inheritance with super keyword
- Method Overriding,
- Nested and Inner Class, Abstract and final keyword, Use of Interface.

Unit – 3 Exception Handling, Multithreading and Streams   **(10 hrs)**

- Types of Errors, Introduction to exception handling, Keywords: try, catch, finally, throw, throws, Creating user defined Exception
- Multithreading: Thread and its Life Cycle (Thread, States), Thread Class and its methods, Synchronization in Multiple Threads
- Stream and its types: Character, Byte, Reading and Writing through Byte Stream Classes, Character Stream Classes, Reading and Writing through Byte Stream Classes, Reading and Writing through java data types, use of StreamTokenzier and Random Access File.

Unit – 4 Applet with Layouts Manager and AWT components: Applets   **(10 hrs)**

- Introduction to Applet, Applet Life Cycle, Implement & Executing Applet with Parameters, Graphics class
- Layout Manager: FlowLayout, BorderLayout, CardLayout, GridLayout, GridBagLayout, BoxLayout, SprigLayout, GroupLayout, Using NO LAYOUT Manager
- AWT components (Button, Label, Checkbox, CheckboxGroup, Choice, List, TextField, TextArea, Scrollbar)
- AWT Containers: Frame and Panel

Unit – 5 Event Handling and GUI using Swing   **(10 hrs)**
- Concept of Event Handling, Event Delegation Model, Event Packages, AWT Event Package, Event Classes, Listener Interfaces, Concept Adaptor Classes.
- Swing: Introduction to Swing, difference Between AWT and, Swing Components, Swing Container, Swing Event Package.

Text Books

1. *A. Balaguruswamy,* 1999, **Programming with JAVA A Primer**, McGraw Hill
2. *Naughton & Herbert Schildt,* **JAVA 2: The Complete Reference***,* McGraw Hill

Reference Books

1. *Steven Holzner, 2005,* **JAVA 2 Black Book**, Dreamtech Press
2. *Khalid A. Mughal* , 2009, **A Programmer Guide to JAVA Certification**, Pearson Education
3. *Mitesh P. Mandaliya, Ms. Rupal B. Parekh*, Programming with JAVA, C. Jamnadas & Co.

16UITCC11	Core 7: RDBMS using Oracle	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concept of database
2. Building Entity Relationship Diagrams (ERDs) and mapping ERDs
3. Manipulate data in tables and create database objects
4. Analyze complex business scenarios, design and create databases using SQL
5. Create PL/SQL blocks of application code that can be shared by multiple forms, reports and data management applications
6. Describe stored procedures and functions
7. Explore the differences between SQL and PL/SQL and explore how PL/SQL is used to extend and automate SQL in administering the Oracle database

Unit -1 Overview of DBMS, RDBMS and Understanding SQL   (10 hrs)

- Introduction to DBMS, RDBMS Concept
- Importance of E.R Diagram in Relational DBMS
- Normalization
- Introduction to SQL
- SQL Datatypes
- Introduction to SQL*PLUS and its formatting commands
- Creating , Altering & Dropping Table Structures

Unit -2 Managing Table and Accessing Data   (10 hrs)

- Data Manipulation Commands like Insert, Update, Delete
- SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT,
- Special operator like IN, ANY, ALL, BETWEEN, LIKE, IS NULL
- JOINS (Inner join ,outer join, self join)
- Subquery (Single row subquery, multiple row subquery)
- Built in Functions
    - Numeric Function
      Abs, ceil, decode, floor, round, mod, sqrt
    - Character Function
      chr, concat, initcap, lower, upper, lpad, rpad, ltrim, replace, rtrim, substr, instr, trim
    - Date Function
      last_day, months_between, next_day, sysdate, systimestamp, to_date, to_char, to_number
    - Aggregate functions
      SUM, COUNT, AVG, MAX, MIN

Unit – 3 Understanding other SQL Objects, Data & Transactional Control Commands, and Concurrency Control using LOCKs   (10 hrs)

- Other Database Objects:
  - View, Sequence, Synonym, Database Link, Index
- Grant, Revoke command
- Understanding Transaction and its commands: Commit, Rollback, Savepoint
- Understanding Locking Mechanism

Unit – 4 PL/SQL   (10 hrs)

- PL/SQL Block Structure
- Control Structures:
  - Conditional Statement
  - Looping Statement
  - Sequential Statement
- %TYPE and %ROWTYPE
- Using Cursor(Implicit, Explicit)
- Exception Handling
- Creating and Using Procedure, Function
- Package
- Triggers
- Composite Data Types:
  - PL/SQL Tables, Nested Tables, Varrays

Unit – 5 Oracle Architecture, Backup & Recovery   (10 hrs)

- Oracle Architecture
  - Physical Database Structure
  - Instance/Memory Architecture
  - Background Database Processes
- Creating & Altering Database
- Opening & shutdown Database
- Overview of Tablespace
- Oracle Blocks, Extent, Segments
- Import, Export
- SQL*Loader, NET8
- Overview of Backup & Recovery

Text Books
1. *Ivan Bayross,* **SQL, PL/SQL the programming Language of Oracle**, BPB Publications
2. *George Koch, Kevin Loney*, **Oracle 10g the Complete Reference**, Oracle Press and Tata MacGraw-Hill

Reference Books
1. *P.S. Deshpande*, 2006, **SQL and PL/SQL for Oracle 10g Black Book**, Dreamtech Press
2. *Ms. Falguni I. Parsana,* **RDBMS Using Oracle,** Bharat & Company, [ISBN : 978-93-81786-38-3]

16UITCC12	Core 8: Operating System Concept with Unix/Linux	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the basic concepts of operating system and Design algorithms of process and memory management
2. Understand the overview of Unix operating system and commands
3. Learn shell programming
4. Understand the overview of Linux configuration and features
5. Handling of Linux server administration

Unit -1 Introduction (10 hrs)

- Meaning of OS
- Functions of OS
- OS Types
- Introduction of OS process
- Process State Transition Diagram
- Process Scheduling
  - FCFS, SJN, Round Robin, Priority Base Non Preemptive, Priority Base Preemptive
- Physical Memory and Virtual Memory
- Memory Allocation
  - Contiguous Memory Allocation
  - Non contiguous Memory Allocation
- Paging

Unit -2 Getting Started with UNIX command (10 hrs)

- Unix Architecture
- Unix Features
- Types of Shell (C, Bourn, Korn BASH)
- Unix File System,
- Unix File & Directory Permissions
- Connecting Unix Shell : Telnet
- Login Commands : passwd, logout, who, who am i, clear
- File / Directory Related Command : ls, cat, cd, pwd, mv, cp, ln, rm, rmdir, mkdir, umask, chmod, chown, chgrp, find, pg, more, less, head, tail, wc, touch
- Operators in Redirection & Piping
- Advance Tools
- Finding patterns in files : grep, fgrep, egrep
- Working with columns and fields : cut, paste, join
- Tools for sorting : sort, uniq
- Comparing files : cmp, comm., diff
- Changing information in files : tr, sed

- Examining file contents : od
- Tools for mathematical calculations : bc, factor
- Monitoring Input and Output : tee, script
- Tools for displaying date and time : cal, date
- Communications : telnet, wall, mtod, write, mail, news, finger
- Process related commands : ps
- command to run process in background : nice, kill, at, batch, cron, crontab, wait, sleep
- Concept of Mounting and DeMounting a File System
    - mount command, umount command

Unit – 3 Shell Programmings   **(10 hrs)**
- Introduction of vi editor
- Modes in vi
- various command
- Shell Keywords
- Shell Variables
- System variables\
    - PS2, PATH, HOME, LOGNAME, MAIL, IFS, SHELL, TERM, MAILCHECK
- User variables
    - set, unset and echo command with shell variables
- Positional Parameters
- Interactive shell script using read and echo
- Decision Statements
    - if then fi
    - if then else fi
    - if then elif else fi
    - case esac
- test command
- Logical Operators
- Looping statements
    - for loop
    - while loop
    - until loop
    - break, continue command
- Arithmetic in Shell script
- Various shell script examples

Unit – 4 Getting Started with Linux   **(10 hrs)**
- Structure and Features of Linux
- Installation and Configuration of Linux - Using with Ubuntu
- Desktop Environment
- Creating Linux User Account and Password
- Install / Uninstall Software

Unit – 5 Linux Admin (Ubuntu) (10 hrs)
- Installing and Managing Samba Server
- Installing and Managing Apache Server
- Optimizing LDAP Services
- Optimizing DNS Services
- Optimizing FTP Services
- Optimizing Web Services
- Configure Ubuntu's Built-In Firewall
- Working with WINE

Text Books
1. *Silberschatz, Galvin, Gagne*, 2009, **WileyOperating System Concepts:8th Edition Wiley Student Edition,** Wiley
2. *Yashavant P. Kanetkar*, 2003, **Unix Shell Programming**, BPB Publications

Reference Books
1. *Sumitabha Das*, 2006, **Unix concepts and applications,** McGraw Hill Education

16UITDA03	DSE Allied 3: Web and M-Commerce Technologies	04 hrs/wk	4 Credits

Objectives:

To enable the students to
1. Understand applications of mobile phones for various marketing disciplines
2. Understand the interrelationships between two media channels – mobile and social and how brands can engage consumers through these channels
3. Develop a strategic approach to define how mobile phones can be aligned and integrated into an overall marketing strategy in organizations
4. Establish a framework for corporate financial decisions
5. Understand major decisions, objective function of the firm and major tools available to fact the decision making process to achieve objective function of firm

Unit -1 Electronic Commerce (10 hrs)
- Traditional commerce and E-commerce, Internet and WWW, Role of WWW
- Value Chains, Strategic Business and Industry Value Chains, Role of E-commerce
- Evolution of E-commerce: Introduction, History of Electronic Commerce, Advantages and Disadvantage of E-commerce, Roadmap of e-commerce in India
- Web Based Tools for E-commerce – Security

Unit -2 Introduction Mobile Commerce and Mobile Marketing (10 hrs)
- What is mobile marketing and m-commerce?
- How does M-Commerce Work?
- Benefits of M-Commerce
- Infrastructure of M–Commerce, Types of Mobile Commerce Services
- Technologies of Wireless Business – Benefits and Limitations, Support, Mobile Marketing & Advertisement
- Differences between fixed Internet e-Commerce and m-Commerce

Unit -3 Mobile Commerce: Technology & Security (10 hrs)
- A Framework for The Study of Mobile Commerce – NTT Docomo's I-Mode
- Wireless devices for Mobile Commerce – Towards a classification framework for Mobile Location Based Services – Wireless Personal and Local Area Networks
- A managerial overview of 2G, 3G, 4G technologies
- A managerial overview of WiFi – Hifi - Lifi (IEEE802.11)
- Web Based Tools for E-commerce – Security

Unit – 4 Mobile Commerce: Theory and Applications (10 hrs)
- Mobile Portals, Mobile Infotainment Services, Mobile Ticketing, Mobile Banking, Mobile Advertising, Mobile e-Tailing, A Closer look at i-Mode and other successful services Mobilizing enterprise applications
- E–commerce in the Automotive Industry – Location– Based Services: Criteria for Adoption and Solution Deployment

- The role of mobile advertising in building a brand – M–commerce Business Models

Unit – 5 Business– to– Business Mobile E– Commerce   (10 hrs)
- Enterprise Enablement – Email and Messaging – Field Force Automation (Insurance, Real Estate, Maintenance, Healthcare) – Field Sales Support (Content Access, Inventory) – Asset Tracking and Maintenance/Management – Remote IT Support
- Customer Retention (B2C Services, Financial, Special Deals) – Warehouse Automation – Security.

Text Books
1. *E.Brian Mennecke, J.Troy Strader,* 2003, **Mobile Commerce: Technology, Theory and Applications**, Idea Group Inc., IRM press
2. *Ravi Kalakota, B.Andrew Whinston,* 2003, **Frontiers of Electronic Commerce**, Pearson Education

Reference Books
1. *P. J. Louis*, 2001, **M-Commerce Crash Course**, *McGraw- Hill Companies*
2. *Paul May,* 2001, **Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business**, Cambridge University Press March
3. *Norman Sadeh,* (2002), **M-Commerce, Technologies, Services and Business Models,** John Wiley & Sons

16UITCC13	Core Practical 5: Object Oriented Programming with JAVA Practical	04 hrs/wk	02 Credits

- Practical based on JAVA Programming Language

16UITCC14	Core Practical 6 : RDBMS using Oracle Practical & Operating System Concept with Unix/Linux Practical	04 hrs/wk	02 Credits

- Practical based on Oracle
- Practical based on Unix/Linux

16UITCC15	Core 9: Programming with C#.NET	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Understand the .NET Framework
2. Understand the foundation of C# programming
3. Possess the understanding of OOP in C#.NET
4. Understand different application of ADO.NET
5. Design Crystal Reports and Create Setup of C# Application

Unit -1 .NET Framework (10 hrs)

- Introduction to .NET Framework Features / Advantages
- MS .NET Architecture
- Types of Projects in IDE (Console, Windows, Web, Setup, etc.)
- Components of the .NET Architecture:
    - Common Language Runtime
    - Common Type System
    - Common Language Specification
    - Base Class Library
    - CTS and CLS BCL / FCL CLR,JIT Compiler
    - Microsoft Intermediate Language
    - Managed/Unmanaged Code
    - Garbage Collection
    - Assembly
    - Namespaces

Unit -2 C# Basics (10 hrs)

- Basic Variables, Declaring Variables
- Data types in C#
- Creation of C#
- First simple Program
- Compilation and Execution
- Type Conversion and casting, Boxing and Unboxing
- Operators in C#
- Decision Making Statements (If-else, Switch)
- Looping (For, While, Do-while, For-each)
- Jumping statement (Break, Continue, Goto)
- Structure, Enumeration
- Arrays (One Dimensional, Rectangular, Jagged)
- Exception Handling

Unit – 3 OOP   (10 hrs)

- Classes and Objects, Encapsulation and Polymorphism
- Access modifiers
- Methods and it's parameters (with "ref" and "out" parameters)
- Method Overloading, Overriding Methods
- Inheritance
- Sealed Class, Abstract Class and Interface
- Properties and Indexer, Delegates and Events

Unit – 4 Working With GUI   (10 hrs)

- Different components (windows) of IDE
- Working with Forms Class
    - Loading, showing and hiding forms, Controlling One form within another, MDI Form.
- Message Box class with all types of Show () method
- Windows Form Controls.
- Standard Controls:
    - Textbox, Label, Button, List box
    - Combo box, Checkbox, Picture Box
    - Radio Button, Panel, Scroll-bar
    - Timer, Datetimepicker, Notify Icon
    - Image List, Link Label, List View
    - Tree View, Toolbar, Status Bar
    - OpenFileDialog, SaveFileDialog
    - Font Dialog, Color Dialog, Print Dialog
- Designing Menu's: Context Menu, Menu Strip, Status Strip, Tool Strip
- Adding Third Party Control in Toolbox

Unit – 5 Database Programming With ADO.NET   (10 hrs)

- ADO.NET Architecture
- Connected and Disconnected Architecture
- Connected Architecture
    - Command
    - Data Reader
- Disconnected Architecture
    - Data Adapter
    - Dataset
    - data Table
    - Data Row
    - Data Column
    - Data Relation
    - Data View

- Data Binding
- Grid View Programming
- Creating Crystal Reports
- Types of Setup Projects
- Creating Setup Project
    - File System Editor
    - User Interface Editor
    - Launch Conditions Editor

Text Books
1. *Steven Holzner*, **C#.NET Programming Black Book**, dreamtech publications
2. *Rebecca M. Riordan,* **Microsoft ADO. Net** , Microsoft Press

Reference Books
1. **Introduction to .NET framework**, Wrox publication
2. **Programming with C#**, Bharat & Co. [ISBN : 978-93-81786-41-3]
3. **Programming with C#.net**, C. Jamnadas & Co. [ISBN : 978-93-81072-64-6]

16UITCC16	**Core 10:** **Web Development using PHP**	**04 hrs/wk**	**4 Credits**

Objectives:

To enable the students to

1. Understand the basic concepts of scripting language and web programming
2. Understand how to implement, dry-run and debug programs.
3. Recognize the benefits of using server side scripting
4. Become equipped to make good choices about model design and use of open source scripting PHP
5. Learn how to build and maintain php websites
6. Understand how to write php scripts and use webserver
7. Understand the concept of client-server architecture

Unit -1 Introduction (10 hrs)

- Introduction of webpages and website
- Static and Dynamic Web
- Client side & Server Side Scripting
- Webserver (IIS & Apache-XAMPP)
- HTTP & HTTPS protocol
- FTP
- Web Hosting, Virtual Host, Multi-Homing
- Distributed Web Server Overview,
- Document Root
- Introduction to PHP
- PHP configuration in IIS & Apache Web server
- Understanding of PHP.INI file
- Understanding of PHP.ht access file
- PHP Variable
  - o Static & global variable
- GET , POST & REQUEST method
- PHP Operator
- Conditional Structure & Looping Structure

Unit -2 Array and Function (10 hrs)

- Array
- User Defined Functions:
  - o argument function
  - o default argument
  - o variable function
  - o return function
- Variable Length Argument Function
  - o func_num_args
  - o func_get_arg,

- o func_get_args
- Variable Function
  - o Gettype, settype, isset, unset,empty, strval, floatval, intval, print_r
- String Function
  - o Chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim trim, substr, strcmp, strops, strrpos, strstr, str_replace, strrev, echo, print, explode(), implode(), md5(), substr_compare(), substr_count(), ucfirst(), ucwords()
- Math Function
  - o Abs, ceil, floor, round, fmod, min,
  - o max, pow, sqrt, rand, cos(),
  - o acos(), sin(), asin(), tan(), atan(),
  - o dechex(), is_finite(), is_infinite(),
- Date Function
  - o Date, getdate, setdate
  - o Checkdate, time, mktime
  - o date_add(), date_create()
  - o date_format(), gmdate()
  - o localtime(), strftime(), strptime(), strtotime()
- Miscellaneous Function
  - o define, constant, include,
  - o require, header, die, exit, GD Library

Unit – 3 Handling Form and Files & Session tracking   (10 hrs)
- Handling form with GET, POST & REQUEST
- Array Function
  - o Count, list, in_array, current,
  - o next, previous, end, each, sort,
  - o rsort, assort, arsort, array_merge,
  - o array_reverse, array_diff(),
  - o array_merge_recursive(),
  - o array_shift(), array_slice(),
  - o array_unique(), array_unshift(),
  - o array_keys(), array_key_exists(),
  - o array_push(), array_pop(),array_multisort(),array_search()
- Cookies
- Session
- Server variables
- PHP Regular expression.
- PHP file Uploading
- File handling Function
  - o fopen, fread, fwrite, fclose,
  - o file_exists, is_readable,
  - o is_writable, fgets, fgetc, file,

- o file_get_contents, fputcsv, fputs,
- o file_putcontents, ftell, fseek,
- o rewind, copy, unlink, rename,
- Sending mail using mail() using php mailer

Unit – 4 Interacting with MySQLi   (10 hrs)
- Working with MySQLi using PhpMyAdmin
- PHP-MySQLi Connectivity and Debug functions
  - o mysqli_connect(), mysqli_set_charset()
  - o mysqli_character_set_name(), mysqli_select_db()
  - o mysqli_close(), mysqli_errno()
  - o mysqli_error_list(), mysqli_error()
  - o mysqli_connect_errno(), mysqli_connect_error()
  - o mysqli_get_charset(), mysqli_get_client_info()
  - o mysqli_get_client_version(), mysqli_get_host_info()
  - o mysqli_get_server_info(), mysqli_get_server_version() ,
  - o mysqli_debug()
- PHP-MySQLi Functions
  - o mysqli_affected_rows(), mysqli_autocommit()
  - o mysqli_commit(), mysqli_data_seek()
  - o mysqli_fetch_all(), mysqli_fetch_array()
  - o mysqli_fetch_assoc(), mysqli_fetch_fields()
  - o mysqli_fetch_object(), mysqli_fetch_row()
  - o mysqli_field_count(), mysqli_field_seek()
  - o mysqli_free_result(), mysqli_insert_id()
  - o mysqli_kill(), mysqli_multi_query()
  - o mysqli_num_fields(), mysqli_num_rows()
  - o mysqli_query(), mysqli_real_escape_string(),mysqli_rollback()

Unit – 5 Advance PHP with OOPS   (10 hrs)
- PHP with OOPS
  - o Class,
  - o Constructor,
  - o Inheritance,
  - o Serialize objects
  - o Database Handling with OOPS
  - o Connection class using OOP
- PHP with AJAX
  - o What is AJAX?
  - o How AJAX Works with PHP
  - o Working with Ajax as Background Process
- JQuery
  - o What is JQuery?
  - o How JQuery Works and how it is created.
  - o Using JQuery with PHP and ajax

Text Books

1. *Ed Lecky-Thompson, Heow Eide-Goodman,* 2004, **Professional PHP5**, Wiley India Pvt. Ltd.
2. *Lynn Beighley*, Michael Morrison, 2009, **Head First PHP & MySQL (A Brain-Friendly Guide)**, O′Reilly

Reference Books
1. *David Powers*, 2013, **PHP Object-Oriented Solutions**, Apress
2. *Keith Wald, Jason Lengstorf*, 2016, **Pro PHP and jQuery**, Apress

16UITCC17	Core 11: Structured Object Oriented Analysis and Design Methodology	04 hrs/wk	4 Credits

Objectives:

To enable the students to
1. Understand the concepts of system study, analysis and Object Oriented Analysis and Design.
2. Understand Importance of each phase in System Development Life Cycle.
3. Understand Importance of Software development Paradigm (Models).

Unit -1 System Study and System Development Life Cycle (10 hrs)
- System, System Types, System Characteristics, System Study, System Approach, Elements of System Analysis, Role and Attribute of System Analyst, Program Analyst, Designer, Information Analyst, Computer Based Information System. Why System Projects?
- System Development Life Cycle
    - Understanding Activities of Each Phase
    - Outcome and Deliverable with Document name of each phase
- Object Oriented Concepts, Identifying elements for Object Model and understanding needs of UML and Designing charts (Class, User Case and Activity) based on it.

Unit -2 Introduction of Software Engineering and Software Development Models
 (10 hrs)

- Software Engineering: A Layered Technology.
- Software Process and Software Process Models.
    - Waterfall Model
    - Iterative Model
    - V-Model
    - Spiral Model
    - Big Bang Model
    - Prototyping Model
    - Object Oriented Paradigm & Process sequence for an OO project

Unit -3 Software Quality Assurance and Computers Aided Software Engineering Tools in Project Management. (CASE tools) (10 hrs)

- Drawing Data Flow Diagram using MS Visio.
- User Interface Flow Diagram.
- Concept of Project Estimation using Function Point and LOC based Metrics.
- Project Scheduling and Tracking by Timeline chart and PERT chart in MS Project. CPM.
- Role of ISO and Six Sigma for Quality Assurance.
- Testing artifacts, static and dynamic testing, testing levels and techniques.

- Introduction to Automated Testing using (any freeware or open source) software testing tools.

Unit – 4 Object Oriented Analysis and Design. (10 hrs)
- Object Oriented Analysis Concepts
- Domain Analysis
- Generic components of Object Oriented analysis model
- Object Oriented analysis process
- Object Relationship model
- Object behavior model
- Design of Object Oriented System
- The System Design Process
- Object Design Process
- Design Patterns
- Object Oriented Programming

Unit – 5 Case Study according to SDLC (10 hrs)
- Student has to prepare synopsis with deep study of system according to phase first , second and third of SDLC.
- Get approval of your Subject Teacher for your work.

Text Books

1. *Priyank Doshi,* **SAD, Software Quality Assurance and Testin**g, Bharat & Co. , [ISBN No. :978-93-81786-36-9]
2. *Roger S Pressman,* **Software Engineering – A Practitioner's Approach**, McGraw Hill

Reference Books
1. *James A. Senn,* 2008, **Analysis & Design of Information System,** McGraw Hill
2. *Rajib Mall*, 2009, **Fundamentals of Software Engineering**, Prentice Hall India Learning Private Limited
3. *Jasson Roff*, 2003, **UML:A Beginner's Guide**, McGraw Hill

16UITDA04	**DSE-Allied 4:** **Management Information System**	**3 hrs/wk**	**3 Credits**

Objectives

To enable the students to

1. Understand MIS in both the wider managerial context and in the narrower confines of the selection, support, design and development of computer applications
2. Focus on the concepts a manager needs to understand, in order to make effective use of, computerised information systems
3. Understand types of MIS applications in organisations
4. Discuss the development of management information systems in organisations

Unit 1: Information & Management (8 hrs)
- Definition of Information
- Types of Information
- Sources, Value and Control of Information
- Need for Information Systems
- Examples of Information Systems
- Impact of IT on organizations and society

Unit 2: Basics of MIS - 1 (8 hrs)
- Decision Making
- Process & Modeling
- MIS and Decision Making
- Classification of Information
- Methods of Data & Information collection

Unit 3: Basics of MIS - 2 (8 hrs)
- Knowledge and Knowledge Management Systems
- Business Intelligence
- General Model of MIS
- Development process of MIS
- Decision Support Systems & Benefits of DSS
- Group Decision Support Systems
- Knowledge based Expert Systems

Unit 4: Applications of MIS (8 hrs)
- Applications of MIS in Manufacturing Sector
- Applications of MIS in Service Sector

Unit 5: Management Issues in MIS (8 hrs)
- Information & Security Control
- Quality Assurance

- Ethical & Social dimensions
- Intellectual Property Rights as related to IT Services/ IT Products
- Managing Global Information Systems

Reference Books:
1. *V.Rajaraman*, 2006, **Analysis and Design of Information Systems,** PHI Publication
2. *Waman S. Jawadekar*, 2009, **Management Information Systems - Text and Cases** , Tata McGrawHill Publication
3. *Ken Laudon, Jane Laudon, Rajanish Dass*, 2010, **Management Information Systems - Managing the Digital Firm**, Pearson Education

16UITCC18	Core Practical 7: Programming with C#.NET Practical	04 hrs/wk	02 Credits

- Practical based on C#.NET

16UITCC19	Core Practical 8: Web Development using PHP Practical	04 hrs/wk	02 Credits

- Practical based on PHP

Shree Manibhai Virani and Smt. Navalben Virani Science College, Rajkot (AUTONOMOUS)
Affiliated to Saurashtra University, Rajkot

Department of Computer Science & Information Technology
M.Sc. INFORMATION TECHNOLOGY & COMPUTER APPLICATION

SEMESTER - I

16PITCC01	Core 1: Advanced Web Development in LARAVEL	04 hrs/wk	4 Credits

Objectives:

To enable the students to
1. Understand OOP in PHP
2. Implement Laravel framework
3. Design and code responsive website
4. Meet current modern market requirement and create fruitful products

Unit -1 Object Oriented Programming in PHP and Bootstrap Basics   (10 hrs)

- **Object Oriented Programming in PHP**
  - The Basics, Properties, Class Constants, Autoloading Classes,
  - Constructors and Destructors, Visibility, Object Inheritance
  - Scope Resolution Operator (::), Static Keyword, Class Abstraction, Object Interfaces, Anonymous classes, Overloading
  - Object Iteration, Magic Methods, Final Keyword, Object Cloning, Comparing Objects, Type Hinting, Late Static Bindings, Objects and references
- **Bootstrap Basics**
  - **Introduction:** File Structure, Basic HTML Template, Global Styles, Default Grid System, Basic Grid HTML, Offsetting Columns, Nesting Columns, Fluid Grid System, Container Layouts, Responsive Design, What Is Responsive Design?
  - **Implementation:** Typography, Code, Tables, Forms, Buttons, Images, Icons, Glyphicons, Dropdown Menus, Button Groups, Button with Dropdowns, Navigations, Navbar, Breadcrumb, Pagination, label, badges, Typographic elements, thumbnails, alerts, progress bar, wells

Unit -2 Introduction to Laravel   (10 hrs)

- What is Laravel, features, MVC architecture, structure of laravel application (laravel directory structure)
- **Installation**
  - Basic requirements for Laravel, Using Laravel Installer, Using Composer, how does Composer work? Installation, Linux & Windows, Finding and installing new packages

- **Configuration**
  - Introduction, Environment configuration, Protecting sensitive configuration, Maintenance mode, database configuration (setting database connection parameter for laravel and artisan)

Unit – 3 Artisan and Routing in Laravel   (10 hrs)

- **Artisan :** Artisan Command Line Tool, database creation, artisan migration, migration structure, creation migration, Database seeding
- **Routing in Laravel** : Basic Routing, Route Parameters, Route Filters, Named Routes, Route Groups, Sub-Domain Routing, Route Prefixing, Route Model Binding, Throwing 404 Errors, Routing to Controllers

Unit – 4 Blade Template and SQL Interaction   (10 hrs)

- **Blade Template** : Template inheritance, Master layout, Extending the master layout, display variables, Blade conditional statements, Blade Loops, Executing PHP functions in blade
- **SQL Interaction** : Introduction, Running Raw SQL Queries, Database Transactions

Unit – 5 Eloquent ORM and Validation   (10 hrs)

- **Eloquent ORM Models:** Naming conventions, table name & primary keys, timestamps
- **Basic Operations:** Create, Retrieve, Update, Delete Using Models, displaying data from models in views.
- **Validation :** Defining The Routes, Creating The Controller, Writing The Validation Logic, Displaying The Validation Errors, Array validations, creating new validators, Error messages & custom errors
- **Available Validators :** Accepted, After (Date), Alpha, Alpha Dash, Alpha Numeric, Array, Before (Date), Between, Boolean, Date, Date Format, Different, Digits, Digits Between, E-Mail, Exists (Database), Image (File), In, Integer, Max, Min, Not In, Numeric, Regular Expression, Required, String Custom validation rules.

Reference Books

1. *Martin Bean,* 2015,**Laravel 5 Essentials**. Published by Packt Publishing. (UNIT 2 to 5)
2. *Jake Spurlock,* May 2013, **Bootstrap**. Published by O'Reilly Media. (UNIT 1)
3. *Hasin Hayder*, December 2007, **Object-Oriented Programming with PHP5,** Published by Packt Publishing. (UNIT 1)
4. *Terry Matula*, October 2013, **Laravel Application Development Cookbook,** Published by Packt Publishing.
5. *Christopher John Pecoraro*, July 2015, **Mastering Laravel,** Published by Packt Publishing.
6. *Shawn McCool*, November 2012, **Laravel Starter,** Published by Packt Publishing.

16PITCC02	Core 2: No SQL Database MongoDB	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Develop proficiency in the specification, representation and various other types in MongoDB using PHP
2. Perform various Analytical as well as to increase the programming skills in PHP using MongoDB.
3. Get a good understanding regarding various styles in Programming
4. Develop a good base for No-SQL queries

Unit -1 Introduction to NoSQL Database and MongoDB   (10 hrs)

- Define NoSQL, its characteristics and history, and the primary benefits for using NoSQL databases
- Define the major types of NoSQL databases including a primary use case and advantages/disadvantages of each type.
- Describe the factors affecting return on investment for using locally hosted database vs. database-as-a-service
- MongoDB concepts – Databases, collections, and documents
- Downloading Installing and running MongoDB, Installing PHP Driver for MongoDB on various OS Platforms
- The Data Model and Working with Data

Unit -2 Learning MongoDB by implementing web Application and Using with RDBMS

(10 hrs)

- Inserting documents in MongoDB, Querying documents in collection.
- Doing advance queries in MongoDB, Updating documents MongoDB
- Deleting documents in MongoDB, Managing relationships between documents
- MongoDB and RDBMS together
- Defining the relational model

Unit -3 Session Management   (10 hrs)

- Understanding HTTP sessions.
- Understanding PHP native session handling,
- Implementing session handling with MongoDB.
- Putting Session Manager.
- Building user authentication module, creating login, logout and user profile.

Unit -4 Aggregation Queries and Web Analytics using MongoDB   (10 hrs)

Aggregation Queries :

- Generating Sample Data.
- Understanding MapReduce,
- Performing MapReduce in MongoDB and PHP, Aggregation using group

Web Analytics using MongoDB :

- Listing distinct values for field
- Counting documents with count()
- Logging with MongoDB,
- Extracting analytics data with MapReduce
- Real-time analytics using MongoDB

Unit -5 Handling Files with GridFS and Database Management   (10 hrs)

Handling Files with GridFS :

- What is Grid?
- Storing files in GridFS
- Serving files from GridFS
- Reading files in chunks

Database Management :

- Database Administration
- Optimization
- Replication
- Sharding

Reference Books

1. *Kristina Chodorow & Michal Dirolf*, **MongoDB the definitive guide**, O'Reilly
2. *Kyle Banker*, **MongoDB in Action**, Manning Sheltar Island.
3. *Eelco Plugge, Peter membrey and Tim Hawkins*, **The definitive guide to MongoDB - NoSQL Database for cloud and desktop computing,** Apress
4. *Rubayeet Islam*, **PHP and MongoDB Web Development Beginers guide**, Open Source

DISCIPLINE SPECIFIC ELECTIVE - I

(Student shall select any one of the following subject as Elective in **1st semester**)

S. No	Semester	Theory	
		Course code	**Course**
1.	I	16PITDC01 /	Application Development using J2EE /
		16PITDC02	Application Development using ASP.NET

16PITDC01	DSE 1: Application Development using J2EE	05 Hours/Week	05 Credits

Objectives:

To enable the students to understand
1. Learn how to download, setup and configure the Spring Framework
2. Explore the Spring Container and Modules
3. Understand dependency injection
4. Learn aspect oriented programming and how it is used to provide cross cutting concerns
5. Understand how Spring deals with transaction management and ORM
6. Hibernate: Inheritance mapping collection mapping.
7. Understand the HQL

Unit - 1 Basics of Spring, Spring with IDE, IOC container and Dependency Injection, Spring AOP **(12 Hrs.)**

- **Basics of Spring, Spring with IDE and IOC container**
    - What is Spring
    - Spring Modules
    - Spring Application
    - Spring in Myeclipse
    - Spring in Eclipse
- **Dependency Injection**
    - Constructor Injection
    - CI Dependent Object
    - CI with collection
    - CI with Map
    - CI Inheriting Bean
    - Setter Injection
    - SI Dependent Object
    - SI with Collection
    - SI with Map
    - CI vs SI
    - Autowiring
    - Factory Method

- **Spring AOP**
  - AOP Terminology
  - AOP Implementations
  - Pointcut
  - Advices

Unit - 2 Spring JDBC, Spring with ORM and SpEL and Spring 3 MVC and Remoting with Spring **(12 Hrs.)**

- **Spring JDBC**
  - JdbcTemplate Example
  - PreparedStatement
  - ResultSetExtractor
  - RowMapper
  - NamedParameter
  - SimpleJdbcTemplate
- **Spring with ORM and SpEL**
  - Spring with Hibernate
  - Spring with JPA
  - SpEL Examples
  - Operators in SpEL
  - variable in SpEL
- **Spring 3 MVC and Remoting with Spring**
  - Spring with RMI
  - Http Invoker
  - Hessian
  - Burlap
  - Spring with JMS

Unit - 3 OXM Frameworks, Spring Java Mail and Web Integration, Basics of Hibernate and Hibernate with IDE and Hibernate Application and Hibernate Logging
(12 Hrs.)

- **OXM Frameworks, Spring Java Mail and Web Integration**
  - Spring with JAXB
  - Spring with Xstream
  - Spring with Castor
  - Spring with Struts2
  - Login and Logout Application
- **Basics of Hibernate and Hibernate with IDE**
  - Hibernate Introduction
  - Hibernate Architecture
  - Understanding First Hibernate application
  - Hibernate in Eclipse
  - Hibernate in MyEclipse
- **Hibernate Application and Hibernate Logging**
  - Hibernate with annotation
  - Hibernate Web application

o Hibernate Generator classes
o Hibernate Dialects
o Hibernate with Log4j 1
o Hibernate with Log4j 2

Unit - 4 Inheritance Mapping and Collection Mapping **(12 Hrs.)**
- **Inheritance Mapping**
  o Table Per Hierarchy
  o Table Per Hierarchy using Annotation
  o Table Per Concrete
  o Table Per Concreteusing Annotation
  o Table Per Subclass
  o Table Per Subclass using Annotation
- **Collection Mapping**
  o Mapping List
  o One-to-many by List using XML
  o Many to Many by List using XML
  o One To Many by List using Annotation
  o Mapping Bag
  o One-to-many by Bag
  o Mapping Set
  o One-to-many by Set
  o Mapping Map
  o Many-to-many by Map
  o Bidirectional
  o Lazy Collection

Unit - 5 Component Mapping, Association Mapping, Transaction Management, HQL
       and HCQL, Named Query, Hibernate Caching and Integration **(12 Hrs.)**
  o One-to-one using Primary Key
  o One-to-one using Foreign Key
  o First Level Cache
  o Second Level Cache
  o Hibernate and Struts
  o Hibernate and Spring

Reference Books
1. *Santosh Kumar K* **Spring and Hibernate**, Tata McGraw-Hill Publishing
2. *Paul Tepper Fisher and Brian D. Murphy* **Spring persistence with Hibernate**, Apress
3. *Chris Schaefer Clarence Ho, and Rob Harrop* **Pro Spring** , Apress
4. **Spring 4 and Hibernate 4: Agile Java Design and Development** McGraw-Hill Education, 2015

16PITDC02	DSE 1: Application Development using ASP.NET	05 Hours/Week	05 Credits

Objectives:

To enable the students to

1. Understand the MVC design pattern and how it's applied in ASP.NET MVC
2. Recognize the benefits of using ASP.NET MVC
3. Become equipped to make good choices about model design and use of Microsoft data access technologies
4. Use ASP.NET MVC's routing system to achieve a REST-style architecture
5. Learn how to build a compelling and maintainable HTML user interface using both the ASP.NET and new Razor view engine

Unit - 1 jQuery   **(12 Hrs.)**

- **Introduction**
  - Need and purpose of JQuery?
  - jQuery Install, jQuery Syntax and Identifying DOM elements
  - Constructing jQuery Selectors The element Selector
  - The #id Selector, The .class Selector.

- **jQuery Events and Effects**
  - Binding event handlers, Removing event handlers
  - $(document).ready(),click(), blclick()
  - mouseenter(), mouseleave(), mousedown(), mouseup(), hover(), focus(), blur()
  - jQuery Hide/Show, jQuery Fade, jQuery Slide, jQuery Callback

- **jQuery HTML and AJAX**
  - jQuery Get, jQuery Set, jQuery Add,
  - jQuery Remove, jQuery CSS Classes, jQuery css().
  - jQuery and AJAX calls Using the ajax() API, Ajax events
  - Loading data with GET & POST,Working with JSON data.
  - PHP with AJAX what is AJAX. How AJAX Works with ASP.NET Working
  - With Ajax as Background Process

Unit - 2 ASP.NET MVC Introduction, MVC - Architecture and Pattern   **(12 Hrs.)**

- A Brief History of Web Development
- Traditional ASP.NET Web Forms
- Benefits of ASP.NET MVC
- MVC Architecture, The MVC architecture pattern
- Domain models and Repositories

Unit - 3 Working with Controllers, Working with Model, Working with Views

                                                               (15 Hrs.)

- Introducing the Controller
- Templated View Helpers
- Using Metadata for Data Values

- Explicitly Validating a Model
- Displaying Validation Messages
- Working with the ASPX engine and Razor Engine
- Partial Views
- Adding Dynamic Content to a Razor View

Unit - 4 Working with URLs and Routing   **(09 Hrs.)**
- About Routing Understanding the Routing Mechanism
- Adding a Route Entry
- Using Parameters
- Using Defaults
- Using Constraints

Unit - 5 Entity Framework 5   **(12 Hrs.)**
- Introducing the Entity Framework
- Code First Approach
- Model first Approach
- Database First Approach

Reference Books

1. *Jon Galloway*, *Phil Haack, Brad Wilson, K. Scott Allen, Scott Hanselman,* **Professional ASP.NET MVC**, WROX
2. *Jeffrey Palermo, Jimmy Bogard, Eric Hexter, Matthew Hinze, Jeremy Skinner* **ASP.NET MVC 4 in Action**, Manning

16PITCC03	**Core Practical 1:** Advanced Web Development in LARAVEL Practical and No SQL Database MongoDB Practical	**04 hrs/wk**	**02 Credits**

- Practical based on LARAVEL & MongoDB

16PITDC03 / 16PITDC04	**DSE Practical 1:** Application Development using J2EE Practical / Application Development using ASP.NET Practical	**04 hrs/wk**	**02 Credits**

- Practical based on J2EE / ASP.NET

16PITCC04	Project	**06 hrs/wk**	**04 Credits**

- Project Development

16PITCC05	Core 3: Application Development using Advanced Android	04 hrs/wk	4 Credits

Objectives:

To enable the students to
1. Develop mobile applications using advanced android api
2. Develop app that supports animation, multimedia, camera and sensor
3. Develop app that supports Network and Bluetooth-Wi-Fi
4. Developing web service and retrieving data using JSON & xml
5. Packaging and distributing android app

Unit -1 Basics of Android (10 hrs)
- **Basics of Android & UI Design**
  - Core building blocks
  - Android manifest.xml file
  - R.java file
  - Basic UI widgets, Activity, Layout, Intent
- **Working with view and adaptor**
  - Adaptors: Array adaptor, Arraylist adaptor, Base adaptor
  - Views: GridView, ScrollView, WebView, SearchView, TabHost, DynamicListView, ExpandedListView
- **Multimedia API**
  - Wallpapaer, Live Wallpaper
  - Audio – Recording audio, Playing audio
  - Video– Recording video, Playing video
  - Alarm Manager
  - Camera - Capturing pictures, configuring camera mode settings, camera parameters, zooming camera

Unit -2 Data Storage & SQLite, Content Provider, Intent & Notifications (10 hrs)

- **Data Storage & SQLite**
  - Shared Preferences
  - Android File System
  - Internal storage, External storage
  - SQLite : Storing data using SQLite, Querying SQLite database, insert-update-delete operations, Persistent database using SQLiteOpenHelper and creating a database
- **Content Provider, Intent & Notifications**
  - Accessing built in content providers
  - Searching for content
  - Adding, changing, and removing content
  - Creating content provider
  - Sending & Receiving Broadcast
  - Notifying user, Notifying with status bar

Unit – 3 Device Connectivity, Working with Sensor, Android Web Service (10 hrs)

- **Device Connectivity**
    - Bluetooth Tutorial –existence of Bluetooth, enable Bluetooth, discover devices, List Paired Devices, establishing connection between devices
    - Working with WiFi
- **Working with Sensor**
    - Sensor API
    - Working with different sensors :Motion Sensor, Position Sensor, Environmental Sensor
    - Sensor Values, SensorManager class, Sensor Class, SensorEvent class, SensorEventListener interface, Compass Acceslerometer and Orientation Sensors
    - Reading sensor data, calibrating sensors, determining device orientation
- **Android Web Service**
    - Introduction to web service
    - Soap Vs Restful web service
    - Android Restful web service example with java servlet
    - Storing data into external database
    - Verifying data in android with external database

Unit – 4 JSON & XML Parsing, WiFi & Bluetooth (10 hrs)

- **JSON & XML Parsing, WiFi & Bluetooth**
    - XML Parsing SAX
    - XML Parsing DOM
    - XML Pull Parser
    - JSON Parsing
    - Integrating Social Networking using HTTP
- **WiFi & Bluetooth**
    - Monitoring and managing Internet connectivity
    - Managing active connections
    - Managing WiFi networks
    - Controlling local Bluetooth device
    - Discovering and bonding with Bluetooth devices
    - Managing Bluetooth connections
    - Communicating with Bluetooth

Unit – 5 Location Based Services and Google Maps, Drawing, Animation and Graphics programing, Packaging, Deploying and distributing / selling app (10 hrs)

- **Location Based Services and Google Maps**
    - Location Based Services - Finding current location and listening for changes in location, Proximity alerts, Working with Google Maps
    - Showing google map in an Activity
    - Map Overlays
    - Itemized overlays
    - Geocoder
    - Displaying route on map

- **Drawing, Animation and Graphics programing**
  - Drawing on screen – using canvas and paint
  - Working with bitmap, shapes
  - 2D Animation - Drawable, View, Property animation
- **Packaging, Deploying and distributing / selling app**
  - Signing certificate
  - Distributing android app via Google Play
  - Obfuscating and optimizing with ProGuard

Reference Books

1. *Joseph Annuzzi, Lauren darcey, Shane Conder*, **Advanced Android Application Development** [4th Edition]**,** Addision – Wesley
2. Ian F. Darwin, **Android cookbook,** Oreilly.
3. *The Android Developer's,* **CookBook-Building Application with Android SDK** [2nd Edition], Addision – Wesley

16PITCC06	Core 4: Introduction to Big Data & Hadoop	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Master the concepts of HDFS and MapReduce framework
2. Understand Hadoop Architecture
3. Setup Hadoop Cluster and write Complex MapReduce programs
4. Learn data loading techniques using Sqoop and Flume
5. Perform data analytics using Pig and Hive
6. Implement HBase and MapReduce integration
7. Implement Advanced Usage and Indexing
8. Implement best practices for Hadoop development
9. Work on a real life Project on Big Data Analytics

Unit -1 Introduction to Big Data and Hadoop   **(10 hrs)**

- **Intruduction**
  - Introduction/Installation of Virtual Box and the Big Data VM
  - Introduction to Linux
    - Why Linux?
    - Windows and the Linux equivalents
    - Different flavors of Linux
    - Unity Shell (Ubuntu UI)
    - Basic Linux Commands (enough to get started with Hadoop)
- **Understanding Big Data**
  - Understanding Big Data
    - 3V (Volume-Variety-Velocity) characteristics
    - Structured and Unstructured Data
    - Application and use cases of Big Data
  - Limitations of traditional large Scale systems
  - How a distributed way of computing is superior (cost and scale)
  - Opportunities and challenges with Big Data
- **HDFS (The Hadoop Distributed File System)**
  - HDFS Overview and Architecture
    - Deployment Architecture
    - Name Node, Data Node and Checkpoint Node (aka Secondary Name Node)
    - Safe mode
    - Configuration files
    - HDFS Data Flows (Read vs Write)
  - How HDFS addresses fault tolerance?
    - CRC Check Sum
    - Data replication
    - Rack awareness and Block placement policy
    - Small files problem

- HDFS Interfaces
  - Command Line Interface
  - File System
  - Administrative
  - Web Interface
- Advanced HDFS features
  - Load Balancer
  - DistCp
  - HDFS Federation
  - HDFS High Availability
  - Hadoop Archives

- **NoSQL Databases - 1 (Theoretical Concepts)**
  - NoSQL Concepts
    - Review of RDBMS
    - Need for NoSQL
    - Brewers CAP Theorem
    - ACID vs BASE
    - Schema on Read vs. Schema on Write
    - Different levels of consistency
    - Bloom filters
  - Different types of NoSQL databases
    - Key Value
    - Columnar
    - Document
    - Graph
  - Columnar Databases concepts

Unit -2 MapReduce – 1 (Theoretical Concepts), Higher Level Abstractions for MR (Pig)
(10 hrs)

- **MapReduce – 1 (Theoretical Concepts)**
  - MapReduce overview
    - Functional Programming paradigms
    - How to think in a MapReduce way?
  - MapReduce Architecture
    - Legacy MR vs Next Generation MapReduce (aka YARN/MRv2)
    - Slots vs Containers
    - Schedulers
    - Shuffling, Sorting
    - Hadoop Data Types
    - Input and Output Formats
    - Input Splits - Partitioning (Hash Partitioner vs Customer Partitioner)
    - Configuration files
    - Distributed Cache
  - MR Algorithm and Data Flow
    - Word Count

- o Alternatives to MR - BSP (Bulk Synchronous Parallel)
  - Adhoc querying
  - Graph Computing Engines
- **Higher Level Abstractions for MR (Pig)**
  - o Introduction and Architecture
  - o Different Modes of executing Pig constructs
  - o Data Types
  - o Dynamic invokers
  - o Pig streaming
  - o Macros
  - o Pig Latin language Constructs (LOAD, STORE, DUMP, SPLIT etc)
  - o User Defined Functions
  - o Use Cases

Unit -3 MapReduce – 2 (Practical), Higher Level Abstractions for MR (Hive)   (10 hrs)

- **MapReduce – 2 (Practical)**
  - o Developing, debugging and deploying MR programs
    - Stand alone mode (in Eclipse)
    - Pseudo distributed mode (as in the Big Data VM)
    - Fully distributed mode (as in Production)
  - o MR API
    - Old and the new MR API
    - Java Client API
    - Hadoop data types and custom Writables/WritableComparables
    - Different input and output formats
    - Saving Binary Data using SequenceFiles and Avro Files
  - o Hadoop Streaming (developing and debugging non Java MR programs - Ruby and Python)
  - o Optimization techniques
    - Speculative execution
    - Combiners
    - JVM Reuse
    - Compression
  - o MR algorithms (Non-graph)
    - Sorting
    - Term Frequency
    - Inverse Document Frequency
    - Student Data Base
    - Max Temperature
    - Different ways of joining data
    - Word Co-Occurrence
  - o MR algorithms (Graph)
    - PageRank
    - Inverted Index

- **Higher Level Abstractions for MR (Hive)**
  - Introduction and Architecture
  - Different Modes of executing Hive queries
  - Metastore Implementations
  - HiveQL(DDL & DML Operations)
  - External vs Managed Tables
  - Views

Unit -4 NoSQL Databases -2 (Practical)   (10 hrs)

- HBase Architecture
  - Master and the Region Server
  - Catalog tables (ROOT and META)
  - Major and Minor compaction
  - Configuration files
  - HBase vs Cassandra
- Interfaces to HBase (for DDL and DML operations)
  - Java API
  - Client API
  - Filters
  - Scan Caching and Batching
  - Command Line Interface
  - REST API
- Advance HBase Features
  - HBase Data Modeling
  - Bulk loading data in HBase
  - HBase Coprocessors - EndPoints (similar to Stored Procedures in RDBMS)
  - HBase Coprocessors - Observers (similar to Triggers in RDBMS)

Unit -5 Spark, Setting up a Hadoop Cluster using Apache Hadoop, HaJdoop Ecosystem and Use Cases   (10 hrs)

- **Spark**
  - Introduction to RDD
  - Installation and Configuration of Spark
  - Spark Architecture
  - Different interfaces to Spark
  - Sample Python programs in Spark
- **Setting up a Hadoop Cluster using Apache Hadoop**
  - Cloudera Hadoop cluster on the Amazon Cloud (Practice)
    - Using EMR (Elastic Map Reduce)
    - Using EC2 (Elastic Compute Cloud)
  - SSH Configuration
  - Stand alone mode (Theory) Distributed mode (Theory)
    - Pseudo distributed
    - Fully distributed

- **HaJdoop Ecosystem and Use Cases**
  - Hadoop industry solutions
  - Importing/exporting data across RDBMS and HDFS using Sqoop
  - Getting real-time events into HDFS using Flume
  - Creating workflows in Oozie
  - Introduction to Graph processing
  - Graph processing with Neo4J
  - Processing data in real time using Storm
  - Interactive Adhoc querying with Impala

Reference Books

1. *Donald Miner, Adam Shook,* **MapReduce Design Patterns Building Effective Algorithms and Analytics for Hadoop and Other Systems**, O'Reilly Media
2. *Boris Lublinsky, Kevin T. Smith, Alexey Yakubovich*, **Professional Hadoop Solutions**, WROX
3. *Tom White*, **Hadoop:The Definitive Guide**, O'Reilly
4. *Eric Sammer*, **Hadoop Operations**, O'Reilly
5. *Dirk Deroos*, **Hadoop for Dummies**, John Wiley & Sons
6. *Alan Gates*, **Programming Pig Dataflow Scripting with Hadoop**, O'Reilly
7. *Dean Wampler, Edward Capriolo, and Jason Rutherglen*, P**rogramming Hive Book**, O'Reilly

16PITCC07	Core 5 : Cloud Computing	04 hrs/wk	4 Credits

Objectives:

To enable the students to

1. Describe cloud computing architecture and services
2. Identify cloud platforms and services
3. Identify design issues of cloud computing
4. Analyze the security factors of implementing cloud environment
5. Understand the server virtualization and its implementation
6. Review real time applications of cloud computing

Unit -1 Overview of Computing Paradigm, Introduction to Cloud Computing and Cloud Computing Architecture (10 hrs)

- **Overview of Computing Paradigm**
  - o Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing
  - o Evolution of cloud computing: Business driver for adopting cloud computing
- **Introduction to Cloud Computing**
  - o Cloud Computing (NIST Model): Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers
  - o Properties, Characteristics & Disadvantages: Pros and Cons of Cloud Computing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing
  - o Role of Open Standards
- **Cloud Computing Architecture**
  - o Cloud computing stack: Comparison with traditional computing architecture (client/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, protocols used, Role of Web service
  - o Service Models (XaaS): Infrastructure as a Service(IaaS),Platform as a Service(PaaS), Software as a Service(SaaS)
  - o Deployment Models: Public cloud , Private cloud, Hybrid cloud, Community cloud

Unit -2 Infrastructure as a Service(IaaS), Cloud Security (10 hrs)

- **Infrastructure as a Service(IaaS)**
  - o Introduction to IaaS: IaaS definition, Introduction to virtualization, Different approaches to virtualization, Hypervisors, Machine Image, Virtual Machine(VM): Resource Virtualization: Server ,Storage, Network, Virtual Machine(resource) provisioning and manageability, storage as a service, Data storage in cloud computing (storage as a service)
  - o Examples: Amazon EC2, Renting, EC2 Compute Unit, Platform and Storage, pricing, customers, Eucalyptus

- **Cloud Security**
  - Infrastructure Security: Network level security, Host level security, Application level security
  - Data security and Storage: Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management, Access Control
  - Trust, Reputation, Risk
  - Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations

Unit -3 Platform as a Service (PaaS), Software as a Service (PaaS), Service Management in Cloud Computing (10 hrs)

- **Platform as a Service (PaaS)**
  - Introduction to PaaS: What is PaaS, Service Oriented Architecture (SOA)
  - Cloud Platform and Management: Computation, Storage
  - Examples: Google App Engine, Microsoft Azure, SalesForce.com, Force.com platform
- **Software as a Service (PaaS)**
  - Introduction to SaaS
  - Web services
  - Web 2.0
  - Web OS
  - Case Study on SaaS
- **Service Management in Cloud Computing**
  - Service Level Agreements(SLAs)
  - Billing & Accounting
  - Comparing Scaling Hardware: Traditional vs. Cloud
  - Economics of scaling: Benefitting enormously
  - Managing Data: Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud, Large Scale Data Processing

Unit - 4 Virtualization (10 hrs)

- Virtualization objectives
- Virtualization implementation
- Virtual servers introduction
- Xen server-Hyper V – I, Hyper V – II, VMWare – I, VMWare – II

Unit - 5 Case Study on Open Source & Commercial Clouds (10 hrs)

- Eucalyptus
- Microsoft Azure
- Amazon EC2

Reference Books

1. *Kenneth Hess, Amy NewMan*, 2010, **Practical Virtualization Solutions**, Prentice Hall
2. *Shahed Latif, Tim Mather, Subra Kumaraswamy* , 2009, **Cloud Security and Privacy : An Enterprise perspective on risks and compliance**, O'Reilly Media Inc.
3. *Gautam Shroff* , 2010, **Enterprise Cloud Computing: Technology, Architecture, Applications**, Cambridge University Press
4. *Barrie Sosinsky,* 2010, **Cloud Computing Bible**, Wiley-India
5. *Rajkumar Buyya, James Broberg, Andrzej M. Goscinski*, 2011, **Cloud Computing: Principles and Paradigms**, Wiley
6. *Nikos Antonopoulos, Lee Gillam,* 2012, **Cloud Computing: Principles, Systems and Applications ,** Springer
7. Ronald L. Krutz, Russell Dean Vines, 2010, **Cloud Security: A Comprehensive Guide to Secure Cloud Computing,** Wiley-India
8. George Reese, 2009, **Cloud Application Architectures: Building Applications and Infrastructures in the cloud**, O'Reilly Media Inc.
9. *Anthony T. Velte, Toby J. Velte, Robert Elsenpeter*, 2010, **Cloud Computing A practical Approach,** McGraw Hill

(Student shall select any one of the following subject as Elective in **2ⁿᵈ semester**)

S. No	Semester	Theory	
		Course code	**Course**
1.	II	16PITDC05 /	Web Searching Technologies & Search Engine Optimization /
		16PITDC06	Wireless Communication & Mobile Programming

16UITDC05	**DSE - II : Web Searching Technology and Search Engine Optimization**	**04 hrs/wk**	**04 Credits**

Objectives:

To enable the students to understand

1. Basics of search engine
2. How to determine SEO objectives?
3. What kind of problems SEO faces?
4. Which elements affect SEO planning?
5. Keyword research
6. Points to be kept in mind while developing a website to make it - SEO friendly
7. How to optimize vertical search

Unit - 1 Search Engine Basics: Reflecting Consciousness and connecting Commerce

(10 hrs)

- The Mission of Search Engines
- The Market Share of Search Engines
- The Human Goals of Searching
- Determining Searcher Intent: A Challenge for Both
- Marketers and Search Engines
- How People Search?
- How Search Engines Drive Commerce on the Web?
- Eye Tracking: How Users Scan Results Pages?
- Click Tracking: How Users Click on Results? Natural
- Versus Paid
- Understanding Search Engine Results
- Algorithm-Based Ranking Systems: Crawling, Indexing,
- and Ranking
- Determining Searcher Intent and Delivering Relevant
- Fresh Content
- Analyzing Ranking Factors

- Using Advanced Search Techniques
- Vertical Search Engines
- Country-Specific Search Engines

Unit - 2 Determining SEO Objectives and Defining Site's Audience (10 hrs)
- Setting SEO Goals and Objectives
- Developing an SEO Plan Prior to Site Development
- Understanding Audience and Finding Niche
- SEO for Raw Traffic
- SEO for E-Commerce Sales
- SEO for Mindshare/Branding
- SEO for Lead Generation and Direct Marketing
- SEO for Reputation Management
- SEO for Ideological Influence

Unit - 3 First Stages of SEO and Keyword Research (10 hrs)
- The Major Elements of Planning
- Identifying the Site Development Process and Players
- Defining Site's Information Architecture
- Auditing an Existing Site to Identify SEO Problems
- Identifying Current Server Statistics Software and
- Gaining Access
- Determining Top Competitors
- Assessing Historical Progress
- Benchmarking Current Indexing Status
- Benchmarking Current Rankings
- Benchmarking Current Traffic Sources and Volume
- Leveraging Business Assets for SEO
- Combining Business Assets and Historical Data to
- Conduct SEO/Website SWOT Analysis
- The Theory Behind Keyword Research
- Traditional Approaches: Domain Expertise
- Site Content Analysis
- Keyword Research Tools
- Determining Keyword Value/Potential ROI, Leveraging
- the Long Tail of Keyword Demand, Trending,
- Seasonality, and Seasonal Fluctuations in Keyword demand

Unit - 4 Developing an SEO-Friendly Website (10 hrs)
- Making Site Accessible to Search Engines
- Creating an Optimal Information Architecture
- Root Domains, Subdomains, and Microsites
- Optimization of Domain Names/URLs
- Keyword Targeting

- Content Optimization
- Duplicate Content Issues Controlling Content with
- Cookies and Session IDs
- Content Delivery and Search Spider Control
- Redirects, Content Management System (CMS) Issues
- Optimizing Flash
- Best Practices for Multilanguage/Country Targeting

Unit - 5 Optimizing for Vertical Search   **(10 hrs)**
- The Opportunities in Vertical Search
- Optimizing for Local Search
- Optimizing for Image Search
- Optimizing for Product Search
- Optimizing for News, Blog, and Feed Search
- Others: Mobile, Video/Multimedia Search

Reference Books

1. *Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola,* 2009 **, The Art of SEO : Mastering Search Engine Optimization,** O'Reilly Media
2. *Jerri L. Ledford*, 2009, **SEO: Search Engine Optimization Bible [2nd Edition],** Wiley India
3. *John I Jerkovic,* 2009, **SEO Warrior: Essential Techniques for Increasing Web Visibility**, O'Reilly Media

16UITDC06	DSE - II : Wireless Communication & Mobile Programming	04 hrs/wk	04 Credits

Objectives:

To enable the students to

1. Introduce the concepts and techniques associated with Wireless Cellular Communication systems.
2. Understand the concept of mobile computing.
3. Compare different types of mobile & wireless networks.

Unit - 1 Introduction to Mobile Computing (10 hrs)
- History of Wireless Communications, Types, propagation modes Wireless network architecture, Applications, Security, Concerns and Standards, Benefits, Future.
- Evolution of mobile computing, what mobile users need, SOC and AOC client.
- Mobile computing OS, Architecture for mobile computing, Three tier architecture, design considerations for mobile computing, mobile computing Through internet, making existing applications Mobile-Enabled.

Unit - 2 Wireless Technologies (10 hrs)
- Bluetooth, Radio frequency identification (Rfid), Wireless Broadband, MobileIP: Introduction, Advertisement, Registration, TCP connections, two level addressing, abstract mobility management model, performance issue, routing in mobile host, Ad-hoc networks.
- Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, transaction Oriented TCP., IPv6.

Unit - 3 Mobile Technologies (10 hrs)
- Global system for mobile communication, Global system for mobile communication, GSM architecture, GSM entities, call routing in GSM,PLMN interface, GSM addresses and identifiers, network aspects in GSM,GSM frequency allocation, authentication and security, Short message services, Mobile computing over SMS,SMS, value added services accessing the SMS bearer.

Unit - 4 General packet radio service(GPRS) (10 hrs)
- GPRS and packet data network, GPRS network architecture, GPRS network operation,
- Data services in GPRS, Applications of GPRS, Billing and charging in GPRS.

Unit - 5 Wireless Application Protocol (WAP) WAP, MMS, GPRS (10 hrs)
- application CDMA and 3G Spread-spectrum Technology, CDMA versus GSM, Wireless data, third generation networks, applications in 3G Wireless LAN,
- Wireless LAN advantages, IEEE802.11 standards, Wireless LAN architecture, Mobility in Wireless LAN, Deploying Wireless LAN, Deploying Wireless LAN.

- Mobile ad-hoc networks and sensor networks, wireless LAN security.
- Wi-Fi v/s 3G Voice over Internet protocol and convergence, Voice over IP, H.323 framework for voice over IP, SIP, comparison between H.323 and SIP, Real time protocols.
- Convergence Technologies, call routing, call routing, voice over IP applications, IMS, Mobile VoIP, Security issues in mobile Information security, security techniques and algorithms, security framework for mobile environment.

Reference Books

1. *Asoke K Telukder, Roopa R Yavagal*, 2005, **Mobile Computing** Published by Tata McGraw-Hill Education. (UNIT 1 to 5)
2. *James Keogh*, 2003, **The complete reference J2ME** Published by Tata McGraw-Hill Education. (UNIT 1 to 5)
3. *Ivan Stojmenovic*, 2006, **Handbook of Wireless Networks and Mobile Computing** Published by A Wiley-Interscience Publication, New-Delhi. (UNIT 1 to 5)
4. *Lothar Merk, Martin Nicklous, Thomas Stober, Uwe Hansmann,* 2006, **Principles of Mobile Computing**, Springer
5. *Jochen Schiller*, 2008, **Mobile Communications**, Pearson
6. *Raj Kamal,* 2011, **Mobile Computing**, Oxford

16PITCC08	**Core Practical 2:** Application Development using Advanced Android Practical	**04 hrs/wk**	**02 Credits**

- Practical based on Advanced Android

16PITCC09	**Core Practical 3:** Introduction to Big Data & Hadoop Practical & Cloud Computing Practical	**04 hrs/wk**	**02 Credits**

- Practical based on Big Data, Hadoop & Cloud Computing

16PITCC10	Project	**06 hrs/wk**	**04 Credits**

- Project Development

SAURASHTRA UNIVERSITY

RAJKOT – INDIA

CURRICULUM FOR

UGC - B.Voc. under National Skills Qualification Framework(NSQF)

Bachelor of Vocation – Applied Computer Technology

(B.Voc.- ACTech.)

(Sanctioned to Shree Manibhai Virani & Smt. Navalben Virani Science College-Rajkot)

(Semester V and Semester VI)

Effective From June – 2016

UGC B.Voc.- Applied Computer Technology (Semester – V)

Sr. No.	Paper No.	Subject	Credit
1	ACTECH 5.1	Business Etiquettes & Interview Techniques	5
2	ACTECH 5.2	Programming with C#.NET	5
3	ACTECH 5.3	Mobile Computing with Android	5
4	ACTECH 5.4	Project Work - II	5
5	ACTECH 5.5	Practical - I (Based on 5.2)	5
6	ACTECH 5.6	Practical - II (Based on 5.3)	5
Total Credits of Semester - V			**30**

Sr. No.	Topics	Details	Marks	Approx Lectures
		ACTECH 5.1 : Business Etiquettes & Interview Techniques		
1	Communication in a Business Organization	- Meaning & Process of Communication - Objectives of Communication - Communication in a business organization ○ Vertical Communication ○ Horizontal Communication ○ Consensus ○ Grapevine Communication - Barriers to Communication ○ Types of Barriers ○ Linguistic and Semantic Barriers ○ Physical / Environmental Barriers ○ Personal / Socio-psychological Barriers ○ Organizational Barriers ○ Cross-cultural Barriers	25	13
2	Basic Official Correspondence & Writing Skills	- Letter Writing - Report Writing - Job Application / Resume Writing	20	10
3	Presentation & Group Discussion Skills	- Presentation Skills ○ Planning a presentation ○ Preparing a presentation ○ Delivering a presentation - Group Discussion Skills ○ Phases of Group Discussion ○ Personality traits required for effective GD ○ Elements of effective GD	15	12
4	Communication Etiquettes	- Introduction to business etiquettes - Telephone Etiquettes - Email Etiquettes - Video Conferencing Etiquettes - Table Manners - Respect in Office Environment	20	13
5	Interview Techniques	- Types of Interviews - Basic Interview Mistakes - Preparing for the interview - Appearing for the interview - Interview follow-up	20	12
		Total	**100**	**60**

Student Seminar   – 5 Lectures
Expert Talk   – 5 Lectures
Student Test   – 5 Lectures

Total Lectures   60 + 15 = 75

Reference Books:
1. Communication Skills by *Vaishali K. Ghadyalji* (Nandu Publications)
2. Communication Skills by *Anasuya Kalavar* (Tech-Max Publications)
3. Effective Interview Skills by *Brian Cahill*

Sr. No.	Topics	Details	Marks	Approx Lectures
1	.NET Framework	Introduction to .NET Framework Features of .NET • Multilanguage Development • Platform and Processor Independence • Automatic Memory Management • Easy Deployment • Distributed Architecture • Interoperability with Unmanaged Code • Security • Performance and Scalability • Versioning Support MS .NET Architecture Components of the .NET Architecture: • Common Language Runtime • Common Type System • Common Language Specification • Base Class Library • JIT Compiler • Microsoft Intermediate Language • Managed/Unmanaged Code • Garbage Collection • Assembly	15	8
2	Introducing C# Programming	Creation of C# Introduction of Visual Studio 2008 IDE First simple Program Compilation and Execution Creating and Organizing Classes and Namespace	5	3
3	C# Basics	Declaring Variables, Keywords, Identifiers, Literals Data types in C# Type Conversion and casting, Boxing and Unboxing Operators in C# DLecision Making Statements	10	8

ACTECH 5.2 : Programming with C#.NET

		(If-else, Switch) Looping (For, While, Do-while, For-each) Jumping statement(Break, Continue, Goto) Structure, Enumeration Arrays(One Dimensional, Rectangular, Jagged) Exception Handling		
4	Object Oriented Programming	Classes and Objects Access modifiers Methods and it's parameters Inheritance and Polymorphism Constructor Inheritance Sealed Class, Abstract Class and Interface Properties and Indexer, Delegates and Events	20	10

5	Working with GUI	Working with Forms Class:
		  • Loading, showing and hiding forms, Controlling One form within another, MDI Form.
		Windows Form Controls:
		  • Standard Controls:
		   Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, Scroll-bar, Timer, Datetimepicker, NotifyIcon, ImageList, Link Label, ListView, TreeView, Toolbar, StatusBar, OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog
		  • Designing Menu's :
		   ContextMenu, MenuStrip, StatusStrip, ToolStrip
		  • User Controls:
		   Creating and using User Control
			20	8

6	Database Programming With ADO.NET	ADO.NET Architecture
		Connected and Disconnected Architecture
		Types of Data Providers
		Introduction to SQL Data Provider
		  • Connection Object
		  • Command Object
		  • DataReader Object
			20	15

		• DataAdapter Object • DataTable Object Dataset Object Differences between DataReader and DataSet Model Database Programming with Data bound controls		
7	Crystal Reports	Creating Crystal Reports Standard, cross-tab, mail label Report Sections Formula fields, Special Fields	5	4
8	Setup Project	Types of Setup Projects Creating Setup Project File System Editor User Interface Editor Launch Conditions Editor	5	4
		Total	**100**	**60**

Student Seminar   – 5 Lectures
Expert Talk   – 5 Lectures
Student Test   – 5 Lectures

Total Lectures   60 + 15 = 75

Reference Books:
1) C#.NET Programming Black Book - steven holzner –dreamtech publications
2) Introduction to .NET framework - Wrox publication
3) Microsoft ADO. Net - Rebecca M. Riordan, Microsoft Press
4) Programming with C# – Bharat & Co.

Sr. No.	Topics	Details	Marks	Approx Lectures
	ACTECH 5.3 : Mobile Computing with Android			
1	Introduction to Android	• The Open Handset Alliance • The Android Platform • Android SDK • Building a sample Android application	6	4
2	Android Application Design	• Anatomy of an Android applications • Android terminologies • Application Context, Activities, Services, Intents • Receiving and Broadcasting Intents • Android Manifest File and its common settings • Using Intent Filter, Permissions • Managing Application resources in a hierarchy • Working with different types of resources	20	15
3	Android User Interface Design	• User Interface Screen elements • Designing User Interfaces with Layouts • Drawing and Working with Animation	20	10
4	Database Connectivity Using SQLite	• Using Android Data and Storage APIs • Managing data using SQLite • Sharing Data Between Applications with Content Providers	20	15
5	Location Based Services (LBS)	• Using Global Positioning Services (GPS) • Geo-coding Locations • Mapping Locations • Many more with location based services	7	3
6	Common Android API	• Android networking API • Android web API • Android telephony API	7	3
7	Notifications	• Notifying the user • Notifying with the status bar • Vibrating the phone • Blinking the lights • Customizing the notifications	5	2

8	Services	• Services • Application development using JSON in MySQL	5	3
9	Accessing Phone services & Live Example	• Live Folders Using sdcards • XML Parsing Example • JSON Parsing Example • Accessing Phone services (Call, SMS, MMS) • Android Sensors (GRAVITY_EARTH)	7	3
10	Deployment of applications	• Publish android application	3	2
		Total	**100**	**60**

Student Seminar   – 5 Lectures
Expert Talk   – 5 Lectures
Student Test   – 5 Lectures

Total Lectures   60 + 15 = 75

Reference Books:
1) Android Wireless Application Development By Lauren Darcey and Shane Conder, Pearson Education, 2nd ed. (2011)
2) Using SQLite By Jay A. Kreibich, Publisher: O'Reilly Media
3) Mobile Computing using Android and iPhone [ISBN: 978 - 93 - 81786 - 93 – 2] by Bharat & Company
4) Professional Android 2 Application Development Reto Meier, Wiley India Pvt Ltd (2011)
5) Beginning Android Mark L Murphy, Wiley India Pvt Ltd

ACTECH 5.4 : Project Work - II	
Topics	**Marks**
ACTECH 5.4	**100**

ACTECH 5.5 : Practical - I (Based on ACTECH 5.2)	
Topics	**Marks**
ACTECH 5.2	**100**

ACTECH 5.6 : Practical – II (Based on ACTECH 5.3)	
Topics	**Marks**
ACTECH 5.3	**100**

UGC B.Voc.- Applied Computer Technology (Semester – VI)

Sr. No.	Paper No.	Subject	Credit
1	ACTECH 6.1	Graphics and Multimedia	5
2	ACTECH 6.2	Web Programming with ASP.NET	5
3	ACTECH 6.3	Mobile Computing with IOS	5
4	ACTECH 6.4	Project Work - III	5
5	ACTECH 6.5	Practical - I (Based on 6.1 & 6.3)	5
6	ACTECH 6.6	Practical - II (Based on 6.2)	5
Total Credits of Semester - VI			**30**

Sr. No.	Topics	Details	Marks	Approx Lectures
		ACTECH 6.1 : Graphics and Multimedia		
1	Sony Vegas Movie Studio Introduction	Video File Formats Different video file formats, video frame size, video frame per second, video quality Capture your voice & video Timeline & Duration	5	3
2	Basic Media Manipulation	Video merge, split, zoom, crop, croma key, picture in picture, video transparency, slide show, time duration, video speed, slow motion, split by scene, multiple video layers and audio layers.	10	5
3	Adding Special Effects & Audio	Effects in video Video transition, video filters, white balance, watermark, special effects Adding Text Adding Audio Multiple audio layers, audio disable/enable, audio composition, audio effect, crop, merge, split	10	7
4	Making a Movie	Movie categories Documentary, small advertisement, short movie Video Rendering Different File formats rendering, video frames, video frame size, HD video, Quality of videos rendering, DVD Making, Web Video	15	8
5	Understanding Motion Graphics & After Effects Interface	Defining Motion Graphics Opening an Existing Project Understanding the Default Workspace Saving a Custom Workspace Setting Preferences in After Effects	10	6
6	Media Management	Importing Media Importing Photoshop and Illustrator Files and After Effects Project Files Using the Interpret Footage Dialog Box	5	3
7	Animation in After Effects	Creating a New Composition Importing Compositions from Photoshop and Illustrator Animating Layer Rotation Parenting Layers Adding Motion Blur Adjusting Blending Modes Creating a Nested Composition	10	6

8	Working with Objects & Effects	Working with Masks 　　　　Basic Masks, Animating Masks, 　　　　Creating Free Form Masks, 　　　　Animating Mask Vertices, Creating 　　　　Track Mattes, Creating Chroma 　　　　Keys Working with Text 　　　　Creating Text Layers, Animating 　　　　Text Properties, Saving Custom 　　　　Text Animation Presets, Working 　　　　with the Existing Text Animation 　　　　Presets, Creating Text on a Path Working with Audio 　　　　Adding Audio Files to the Timeline, Animating Audio Levels, Adding Effects to Audio Layers, Creating Key Frames from Audio Levels	20	15
9	Advanced Animation Techniques	Saving Animation Presets, Using Motion Sketch to Capture Motion, Using the Wiggler to Add Frenetic Motion, Adding Easing to Key Frames, Using the Graph Editor	5	3
10	After Effects Projects	Rendering Video Files Adjusting Render Settings Creating Render Templates Collecting Files for Backup	10	4
		Total	**100**	**60**

Student Seminar　　　– 5 Lectures
Expert Talk　　　　　– 5 Lectures
Student Test　　　　　– 5 Lectures

Total Lectures　　　60 + 15 = 75

Reference Books:

1) Sony Vegas Pro 11 Beginner's Guide, by Duncan Wood (Author) – Paperback
2) Adobe After Effects CS6 Classroom in a Book by Adobe Creative Team (Author) – Paperback
3) Adobe After Effects CC Classroom in a Book, by Adobe Creative Team (Author) – Paperback
4) Adobe After Effects CS6 Visual Effects and Compositing Studio Techniques, by Mark Christiansen (Author) - Paperback

	ACTECH 6.2 : Web Programming with ASP.NET			
Sr. No.	Topics	Details	Marks	Approx Lectures
1	Framework & Web Contents	Overview of ASP.NET framework, ASP.NET Page Structure, Page Life Cycle and Events HTML Controls and ASP.NET Standards Controls Installation of IIS.	15	13
2	Validation and Rich Controls	Overview of Form Validation • Client Side Validation • Server Side Validation ASP.NET Validation Controls • Required Field Validator Control • Compare Validator Control • Range Validator Control • Regular Expression Validator Control • Custom Validator Control • Validator Summary Rich Controls • Ad rotator Control • Calendar Control • File Upload Control	10	7
3	State Management	Client Side State Management • HiddenField Control • ViewState • Cookies • Query String Server Side State Management • Session State • Application State	10	4
4	Overview of Master Pages and Ajax	Master Page • Overview of Master Page • Creating and Using Master page • Creating default contents • Nesting Master pages Theme • Skin file • CSS file Ajax • Ajax Server Controls • Script Manager • Update Panel Control • Timer Control	15	6

5	ADO.Net & Database Connectivity	Architecture of ADO.NET
		Types of Data Provider
		Introduction to SQL Data Provider
		  • Connection Class
		  • Command Class
		  • DataAdapter Class
		  • Date Reader Class
		  • Dataset Class.
		  • Data table Class
		Connected and Disconnected Architecture
		Types of DataSource Controls
		Types of ASP.NET Parameters
		Overview of Data Controls
		  • GridView Control
		  • DetailsView Control
		  • DataList Control
		  • FormView Control
		  • Repeater Control
			25	18

6	XML & Web Services	Overview of XML
		  • Writing datasets to XML
		  • Reading datasets with XML
		Web Services
		  • Overview of Web services
		  • Common standards for Building and Consuming Web Service
		  • Creating and Consuming Web Service
			10	5

7	Web Application & Configuration	Overview Asp.net Configuration Common Configuration Tracing Custom Error Authentication & Authorization	15	7
		Total	**100**	**60**

Student Seminar   – 5 Lectures
Expert Talk   – 5 Lectures
Student Test   – 5 Lectures

Total Lectures   **60 + 15 = 75**

Reference Books:
1) Asp.Net – Unleashed
2) Asp.Net – Wrox Publication
3) Programming With ASP.NET [ISBN: 978 - 81 - 909634 - 7 – 3] by Bharat & Company
4) Beginning ASP.NET.3.5.in.C.Sharp.2008.From.Novice.to.Professional - Apress

	ACTECH 6.3 : Mobile Computing with IOS			
Sr. No.	Topics	Details	Marks	Approx Lectures
1	Introduction and Application Development Fundamentals	• Overview of Mobile Computing (iOS) • Specifics of mobile devices • Programming fundamentals including computer programs, languages, compilers • iOS Software Development Kit (SDK) and Cocoa Touch Architecture. • Using the iOS tools -Xcode and Interface Builder to create apps • Testing apps in the iOS Simulator	8	4
2	Handling Basic Interaction & Objective-C for Experienced Programmers	• Data Types NSInteger NSNumber Operators Loop • Intro to .H and .M Files • Inheritance, Method Overloading Mutable and Immutable Strings, Mutable and Immutable Arrays Objective-C • Classes, Objects, and Methods • Declared Properties, Memory Management, Automatic Reference Counting (ARC) • Categories and Extensions • Formal and Informal Protocols • Blocks	10	6
3	User interface & controls	• The View Hierarchy • Containers • Controls • Gestures Controllers • Text and Web Views • View Autosizing • Views (Alertview, Table Views, Picker, Date and Time, Image) Navigation Based Application Development Tab Bar and Toolbar Audio and Video	15	8
4	Human Interface	• Creating a great user interface • Designing the user interface with wireframes, and in Interface • Building System provided buttons and	12	8

		icons • Model-View-Controller (MVC) paradigm • Collections to hold data such as NSArray and NSMutableArray • Utility App to display multiple views • MainView and FlipsideView		
5	Table Views	• Static and Dynamic Table Views • Delegates and DataSources • Table View Styles • Custom Cells	6	4
6	Application Settings and Data Persistence	• Exploring your file system • Reading Data from file • Creating and deleting files and directories • Writing data to files • iCloud • Key-Value Data • Archiving	10	5
7	Single & Multi-touch Gesture	• The Responder Chain • Touch Notification Methods • Enabling Multi-touch on the View • Gesture Motions • Gesture Recognizers	8	4
8	Core Location	• Using the Location Manager • Setting the desired accuracy • Setting the distance filter	5	3
9	Working with Data	• SQLite Integration • Using SQLite Directly • Overview of Core Data • Managed Objects • Persistent Store Coordinator Entity Descriptions • Retrieving and Modifying Data	8	5
10	Notifications & Localization	NOTIFICATION : • Local Notifications • Push Notifications LOCALIZATION : • Resources • Language and Region • NSLocale • Text • Dates • Numbers	8	6

11	How to create Certificate? & How to Upload App In AppStore?	• What is Certificate? • How to make certificate? • How to implement certificate in our app? • How to Upload App in AppStore ?	5	4
12	What's New in iOS ?	• What is Swift? • What is new in iOS 9?	5	3
		Total	**100**	**60**

Student Seminar   – 5 Lectures
Expert Talk   – 5 Lectures
Student Test   – 5 Lectures

Total Lectures   60 + 15 = 75

Reference Books:
1) Beginning iOS 5 Development: Exploring the iOS SDK;
   David Mark, Jack Nutting, Jeff LaMarche; Apress; ISBN---13:978---1430236054
2) Beginning iOS 6 Development By David Mark , Jack Nutting , Jeff LaMarche , Fredrik Olsson - Apress Publication
3) Programming in Objective-C (5th Edition) (Developer's Library) by Stephen G. Kochan
4) iPhone OS Technology Overview, Apple Computer
5) The Objective-C 2.0 Programming Language, Apple Computer
6) Web reference : http://developer.apple.com

ACTECH 6.4 : Project Work - III	
Topics	**Marks**
ACTECH 6.4	**100**

ACTECH 6.5 : Practical - I (Based on 6.1 & 6.3)	
Topics	**Marks**
ACTECH 6.1	**50**
ACTECH 6.3	**50**

ACTECH 6.6 : Practical – II (Based on ACTECH 6.2)	
Topics	**Marks**
ACTECH 6.2	**100**

Shree Manibhai Virani and Smt. Navalben Virani Science College, Rajkot (Autonomous)
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Syllabi for Part – II Generic Elective Courses

Offering Department : Department of Computer Science & Information Technology

SEMESTER V & VI

16UCSGE01	Cyber Security	02 hrs/wk	02 Credits

Objectives:

To enable the students to
1. How to protect them self and ultimately society from cyber attacks
2. Understand Risks & Vulnerabilities of system
3. Understand the different concept of information security and its application

Unit -1 Introduction to Cybercrime   (06 hrs)

- Definition and Origins of the Word Cybercrime and Information Security
- Classifications of Cybercrimes (E-Mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Hacking, Online Frauds, Pornographic Offenses , Software Piracy, E-Mail Bombing/Mail Bombs, Computer Network Intrusions, Password Sniffing, Credit Card Frauds)
- Categories of Cybercrime
- Criminals Plan to the Attacks: Reconnaissance, Passive Attack, Active Attacks, Scanning/gathered Information, Attack (Gaining and Maintaining the System Access), Social Engineering

Unit -2 Introduction to Cyber security   (06 hrs)

- Cyber security objectives
- Cyber security roles
- Differences between Information Security & Cyber security
- Principles of Cyber security
  - Confidentiality, integrity, & availability
- Authentication & non-repudiation

Unit – 3 Information Security Concept   (06 hrs)
- Information Security Overview
- Information Security Services
- Goals for Security
- E-commerce Security.
- Computer Forensics
- Steganography

- Cryptography

Unit – 4 Operating System Security   **(06 hrs)**
- OS Security Vulnerabilities, updates and patches
- OS integrity checks
- Anti-virus software
- Design of secure OS and OS hardening
- Configuring the OS for security (Technique)

Unit – 5 Future Implications & Evolving Technologies   **(06 hrs)**
- New & emerging in IT & IS technologies
- Mobile security issues, risks, & vulnerabilities

Reference Books

1. *Sunit Belapure Nina Godbole*, 2011, **Cyber Security,** Wiley
2. *Er. Abhishek Kumar Singh Er. Sushil Kumar Singh,* 2015, **Cyber Security***,* Vayu education of India
3. *Mike Shema*, *Anti*-**Hacker Tool Kit (Indian Edition),** Mc Graw Hill

16UCSGE02	**Emerging Information Technologies**	02 hrs/wk	02 Credits

Objectives:

To enable the students to
1. Understand the role of technology in day to day life
2. Understand day to day use of latest technologies
3. Understand various mobile technologies
4. Understand the different tools to make their presentation and diagrams more meaningful and effective
5. Understand the different search technique to make search more precise.

Unit -1 History and Foundations (06 hrs)

- Role of Technology in day to day life
- Communication and Emerging Technology Overview
- Introduction of emerging technologies in Information Technology, Nanotechnology, Agriculture, Medical science, Chemistry, BioInformatics.

Unit -2 Role of Technology in Education (06 hrs)

- Online Study Tools Every Student Should Know,
- Use of learning management system (LMS)(Google Class, Edmodo, Flintt)
- Online Presentation tools To make effective presentation (Prezii etc..)
- Different Diagramming tools (Online/Desktop)
- Google advance searching techniques(Image,video)
- Use of Online storage(Google Drive, Sky Drive etc)

Unit – 3 Emerging mobile technologies (06 hrs)

- Introduction of CDMA and GSM
- GIS, GPS
- 2G,3G,4G
- Blue tooth, Wi-Fi, hotspot, Virtual Reality, 3D Touch.
- Cloud Computing

Unit – 4 Various Emerging technologies for day to day life (06 hrs)

- Internet of things(IOT)
- High-Precision Location Sensing
- Next Generation Batteries, The Blockchain, 2D Materials, Autonomous Vehicles, Organs-on-chips, Wearable Devices, Mobile-Connected Smart Objects, LTE and LTE-A, Nano sensors

Unit – 5 Emerging technologies in IT (06 hrs)
- Computer Assisted Translation (CAT)

- Semantic Web
- Emerging and Influential Technologies
    - Blogs/Social Networking Technologies, Gaming Technologies

Reference Books

1. *Sunil V.K. Gaddam,* 2010, **Information Technology: Emerging Trends,** Vitasta Publishing Pvt. Ltd.

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Syllabi & Evaluation norms for Part-III courses
Offering Department : Department of Computer Science & Information Technology

SEC – II Co-curricular Courses

ANY SEMESTER BETWEEN II TO V

16UCSCOC1	Network Administration	80 hrs	1 Credit

Objectives:

To enable the students to
1. Understand basic concepts of network
2. Understand how network works
3. Understand requirements and importance of different transmission media
4. Understand role of different network devices
5. Install and configure server
6. Learn different network simulator tools
7. Learn to simulate and monitor network using tools
8. Learn to configure the basic server and DNS in detail with implementation

Unit -1 Basics of network & **Transmission media**   (10 hrs)
- Network concepts
    - What is network, Network model-Peer to peer, Client-server
- Network Services- File service, Print service, Communication service, Database service, Security service, Application service
- Network models and LAN sharing
    - OSI reference model
    - Disk quota, compression, mapping of network drive, File and print sharing
- Network Cable
    - Guided media
        - Co-axial cable, Twisted pair cable, Fibre optic cable
    - Unguided media
        - Infrared, laser, microwave, Bluetooth

Unit – 2 Network Devices Switching concepts   (10 hrs)
- Network devices
    LAN card, MODEM, DSL & ADSL, HUB (Active, passive and smart), Repeater, switch, bridge, router, Wireless switch, wireless router, access point
- Switching technology
    Circuit switching, Message switching, Packet switching

Unit – 3 Network devices, Protocols and Simulators Tools   **(20 hrs)**
- Protocols
  - HTTP, FTP, SMTP, POP3,TCP /IP,
- IP addressing
  - IPv4 with class structure
  - Migration from IPv4 to IPv6
- Network Monitoring Tools (Online/ Offline)
  - WireShark
  - OpenNMS
  - Zenoss Core etc
  - Monitor Network performance

Unit – 4 Server Administration   **(20 hrs)**
- Installation of Server
- Installation and configuration of Active Directory
  - Active Directory Installation & Configuration
  - Securing active directory domain services
  - Domains, Trees, Forests concept
  - Accounts(User, Group, Computer)
  - Policy (Security and audit)
  - Logging Events
  - Creating network drive
  - DNS & Installing DNS

Unit – 5 Network Administration, Configuration & Troubleshooting   **(20 hrs)**
- Network Simulation Tools details
- Network Simulation applications(Using Tool)
  - Basic router setup
  - Setting up router name and password
  - Basic switch setup
  - Switch configuration
  - Setting up telnet
  - Interfaces Configuration
  - VLAN & VTP setup

Reference Books

1. *Glenn Berg,* 1998, **MCSE Networking Essential**, Glenn Berg Tech. Media
2. *Behrouz A. Forouzan*, 2006, **Data Communication and Networking (SIE),** McGraw-Hill
3. *Andrew S. Tanenbaum,* 2002, **Computer Networks** [Fourth Edition], Pearson Publication

16UCSCOC2	E-Marketing	80 hrs	1 Credit

Objectives:

To enable the students to

1. Work with a general model of online marketing and place online marketing tools, instruments and theories into a broader theoretical model/framework
2. Understand what the importance is of online marketing and social media to contemporary marketing
3. Learn how to use the internet as a research method and learn and practice on how to publish information on the internet themselves
4. Learn how to advertise in websites
5. Understand how to generate revenue from advertisement

Unit 1 Overview of E-Marketing (10hrs)
- Introduction
- Objectives, Definition of e-marketing, features of e-marketing
- Scope and Benefits of e-marketing
- Problems in e-marketing
- E-marketing techniques
- Digital marketing and Internet Marketing

Unit 2 Building Websites using Wordpress & Social Media Marketing (20 hrs)
- Building websites for e-marketing
- Introduction & Installation of Wordpress
- Working with content
- Creating basic theme
- Creating Widgets and Plugins
- Introduction to Social Media
- Social Networking Platforms
- Blogging
- Microblogging using twitter
- Facebook Marketing
- Youtube Marketing

Unit 3 Search Engine Optimization (10hrs)
- What is SEO
- what is search_marketting
- white hat SEO
- what is black SEO
- Browser Addon
- SEO project management
- Determining Top Competitors
- Benchmarking Current Indexing Status
- Benchmarking Current Rankings

- Benchmarking Current Traffic Sources and Volume
- Conduct SEO/Website SWOT Analysis
- The Theory Behind Keyword Research
- Traditional Approaches: Domain Expertise
- Site Content Analysis
- Keyword Research Tools
- Google Tag Manager in detail with tagging

Unit 4 Analytics Using Webmaster Tools (20hrs)
- Webmaster Tools (Google, Bing)
- Google Adsense
    - Understanding Google Adsense,
    - Configuring your First Add,
    - Using Advance Add Placement Strategy,
    - Allowing and Blocking Ads, Using Performance Report,
    - Advanced Administration(Accessing Messages, Reviewing Payment Setting)

Unit 5 Other E-marketing Techniques (20hrs)
- E-mail marketing
- Google Site(site.google)
- Google Adword
    - Introduction,
    - Exploring where ads show up
    - Understanding the structure
    - Creating an account,
    - Choosing between billing options, Starting Your First Campaign,
    - Customizing Your Campaign Settings
    - Creating Your First Ad Group , Optimizing Your Ads, Working Offline with AdWords Editor

Reference Books

1. *Lorrie Thomas*, 2011, **The McGraw-Hill 36-Hour Course: Online Marketing**, McGraw-Hill Education
2. *Stephanie Leary*, 2010, **Beginning WordPress 3**, Apress
3. *Dan Zarrella*, 2009, **The Social Media Marketing Book**, O'Reilly Media
4. *Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola,* 2009 **, The Art of SEO : Mastering Search Engine Optimization,** O'Reilly Media
5. *Jerri L. Ledford*, 2009, **SEO: Search Engine Optimization Bible [2nd Edition],** Wiley India

Evaluation norms for Co-Curricular Courses

Both the theory and practical examination will be conducted to evaluate the students in the following way.

1. **Theory**

    Theory examination will be of total 50 marks and will have only Continuous Internal Evaluation (CIE) component.

Sr.	Component	Content	Duration	Marks	Sub Total
a)	Test-I Test-II	Any 2 units All 5 units	1.5 hrs 2 hrs	10 (set for 30) 20 (set for 50)	30
b)	Assignment-I Assignment-II	- -	- -	10 10	20
				Grand Total	50 Marks

2. **Practical**

    Practical examination will be of total 50 marks and will have only Continuous Internal Evaluation (CIE) component.

Sr.	Component	Content	Duration	Marks	Sub Total
a)	Test-I Test-II	50% of experiments All experiments	2 hrs 3 hrs	10 (set for 30 marks) 20 (set for 50 marks)	30
b)	Practical Assignments	-	-	20	20
				Grand Total	50 Marks

Guidelines for completion of the course

1. Only remarks will be given at the end of the course
2. A separate certificate on completion of each course will be issued by the CoE
3. All above are compulsory components
4. In event of non-completion of course, the student has to re-do the course or opt for another one.

At the end of the semester no marks will be given, only remarks will be given as follows:

Range of Marks (Theory + Practical)	Remarks
90-100	Excellent
75-89	Very Good
60-74	Good
40-59	Fair
39 & Below	Not Completed

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Syllabi for Part-III courses
Offering Department : Department of Computer Science & Information Technology

SEC – III Value Added Courses
ANY SEMESTER BETWEEN II TO V

16UCSVA01	E-learning tools	40 hrs	1 Credit

Objectives:

To enable the students to
1. Understand the concept of internet
2. Understand the use of Google tools & Technology
3. Create a document , presentation with formatting by using online tools
4. Understand the working of internet ,DNS
5. Create an effective presentation and diagram using online and offline tools
6. Create Simple website

Unit -1 Introduction of Internet   (08 hrs)

- Introduction of Network
    - Computer Networks & Type of Computer Network
    - Remote Desktop Login
    - What is Internet? & Use of Internet?
- Applications of Internet
    - World wide web(web page, web site, web client, URL web server)
    - DNS and Web Hosting
    - Email and how email transfer works, Social media and E-commerce
    - Data transfer over Internet
- How to stay safe on internet?
- How to download and upload?
- IP addressing

Unit -2 Google Tools & Technology   (08 hrs)

- Internet search and Content
    - Google Trends
    - Google alerts(news and search e-mail alerts)
    - Google Earth (3-D satellite Imagery),
    - Google Image Search
    - Google Labs (online services research and development)

- o Google Local, Google Play Store (Marketplace for digital content)
- o Google (Google gravity , Google Water , Google Sphere etc...)
- Tools and application
  - o Google sites (To create your personal Homepage) , Google profile
  - o Blogger
  - o Gmail, Google Drive (Docs , Forms etc), Google Chrome(web browser)
  - o Google Language tools
  - o Google Code
  - o Google Calendar , Google Reader , Google Voice
  - o Google Checkout (Google wallet)
  - o Google Class room

Unit – 3 Office Made Easy and Other Utility tools & technique   (08 hrs)
- Word processing tool in detail
- Spreadsheet
- Presentation tool
  - o Online/Offline presentation tool to make effective presentation(powtoon etc)
  - o Diagrammatic Tools (Online and offline)
- Different File Conversion Tools

Unit – 4 Learning Management SystemTools   (08 hrs)
- Moodle
- Coursera, edx, Udemy, Lynda, Udacity, Codeschool, Microsoft Virtual Academy etc
- Overview of Freelancing (Fiverr etc)

Unit – 5 Other E-Learning Resources and Tools   (08 hrs)
- Online Certification sites
- Online tools
  - CourseLab
  - exelearning.org , lamsfoundation.org
  - NPTEL
  - MIT Open Course Ware
  - Learners TV

Reference Books

1. *R.K. Taxali ,* **Pc Software For Windows Made Simple,** McGRAW HILL

Web References
1. http://www.google.com
2. www.courselab.com
3. nptel.ac.in
4. https://ocw.mit.edu, https://www.edx.org
5. https://www.coursera.org, https://www.udemy.com, https://www.lynda.com/
6. www.learnerstv.com

16UCSVA02	Desktop Data Publishing	40 hrs	1 Credit

Objectives:

To enable the students to

1. Create composite images that demonstrate advanced selection and layering techniques
2. Use basic selection tools and edge refinement to isolate and edit parts of an image
3. Manipulate layers through ordering, positioning, scaling, rotation, and adjustments
4. Prepare images for Web and print output with appropriate sizing and resolution
5. Apply painted masks, selection-based masks, gradient masks, and blend modes to create sophisticated image effects
6. Set and modify typography using the full range of type tools, the Character panel, and the Paragraph panel.
7. Apply special effects to typography using masks, paths, and layer styles.

Unit -1 Introduction to Photoshop (08 hrs)

- About Adobe Photoshop
- Graphics Basics
- Exploring Menus & Panels
- Customizing Workspaces
- Different file formats
- Work area Using Rulers and Guides
- Introduction to Colour
- Image Manipulation & Painting tools

Unit -2 Working with Layers, Image Post Production (Image Processing) (08 hrs)

- **Working with Layers**
  - Color Management, Levels & Curves, Using Retouching tools, Spot Healing Brush, Clone Stamp, Pattern Stamp, Red Eye, Eraser, Blur, Sharpen, Smudge, Dodge, Burn, Sponge Blurring and Sharpening Images, Color Replacement Tool, The Free Transform command

- **Image Post Production (Image Processing)**
  - Getting started with Photoshop Filters
  - Liquify Command
  - Exploring filters
  - Blur, Distort, Noise, Pixelate
  - Render, Sharpen, Stylize, Smart Filters, Lens Correction

Unit – 3 Scripting (08 hrs)
- Action
  - Using the Action palette, Droplet
  - Recording, Playing, Editing Action

- Adobe ImageReady
  - The Image Ready Interface
  - Image Maps
  - Image Slicing

Unit – 4 CorelDraw Basics and Interface   **(08 hrs)**
- Exploring the CorelDraw Screen
- File Management
- Moving Around and Viewing Drawings
- Customizing Options
- Setting File Backups
- Objects- Creation and Manipulation, Drawing and Shaping Objects

Unit – 5 Working With Special Effects   **(08 hrs)**
- Drawing with the Artistic Media Tool
- Shaping an Object with an Envelope
- Working with Text
- Working with Paragraph
- Special Text Effects
- Using Symbols and Clipart
- Working with Bitmaps
- Advanced Features
- Special Page Layouts

Reference Books

1. *Andrew Faulkner, Conrad Chavez,* **Adobe Photoshop Classroom in a Book,** Adobe
2. *M.C. Sharma,* **Corel Draw: Graphics Suite,** BPB Publication