FACULTY OF SCIENCE

SYLLABI

FOR

COMPUTER APPLICATIONS
(ELECTIVE as well as Add-on)

1st, 2nd Year (Semester System)
&
3rd Year (Annual System)

(SEMESTER SYSTEM)

For

2015 - 2016 SESSIONS

--:O:--
PANJAB UNIVERSITY, CHANDIGARH.

Computer Applications (Elective) For B.A./B.Sc./B.Com. I, II, III (Session 2015 - 2016)

SUMMARY CHART

COMPUTER APPLICATIONS

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<th>Sr. No.</th>
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<td>9. 3rd Year</td>
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<td>Programming with VB and Oracle</td>
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<td>Minor Project based On VB &amp; Oracle</td>
<td>6</td>
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Note:

The evaluation to be done by the college teacher on the basis of performance/evaluation report obtained from the place of On-the-job training.

The evaluation will be done by internal/external examiner on the basis of Project Report submitted by the candidate and Viva-voce examination.
FIRST SEMESTER


Total Periods: 60                                      Max. Marks: 65
(6 Periods/week)                                       Exam Hours: 3

Note :

i.  The Question Paper will consist of Four Sections.

ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.

iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.

iv.  All questions carry equal marks unless specified.

Objective: The course enables the students to be familiar with fundamentals of computer and basics of C programming language.

SECTION - A

1.  Computer Appreciation: Introduction, Characteristics of computer; Hardware, Software, Firmware, History of computers; Applications of computers; Input, Process and Output; classification of computers based on size, working principles, generations; Input and Output devices; Secondary storage devices; Types of software; system and Application software; Generation of Languages; Translators - Interpreters, compilers, Assemblers

2.  Data, Information, Computer arithmetic and Number systems, ASCII & EBCDIC character sets.

   (No. of Lectures : 15)

SECTION - B

3.  Introduction to multiprocessing, time sharing, multi tasking and real time computing.

4.  Introduction to computer based Problem-solving, Algorithms, Top-down design and stepwise refinement (breaking a problem into sub-tasks), basic programming constructs, documentation of programs, program testing

   (No. of Lectures : 15)

SECTION - C

5.  ‘C’ Language: History, Structure of a C program, Data types, Constants and variables, Operators and Expressions, I/O functions, Formatted Input/Output, Unformatted Input/Output; Control constructs, type modifiers and storage classes, Preprocessor: #define, #include, #undef, #conditional compilation directives (#if, #else, #elif, #endif, #ifdef and #ifndef), Header files (stdio.h, ctype.h, string.h, math.h, stdlib.h, time.h); Type casting, Type conversion, Scope Rules: Local and Global variables.

6.  Functions: library functions, user defined functions, scope rule of functions, Parameter passing: call by value and call by reference, calling functions with Arrays, Recursion: Basic concepts, Design examples (Tower of Hanoi, Recursive quick sort)

   (No. of Lectures : 15)
SECTION - D

7. Arrays: One dimensional and Two dimensional arrays. Pointers: & and * operators, Pointer expression, Pointer assignments, Pointer arithmetic. The dynamic allocation functions - malloc and calloc, Pointer vs Arrays, Passing Array to functions, Arrays of pointers, Functions with variable number of Arguments

8. Structures: Basics of Structures, Declaring a structure, Referencing structure elements, Array of structures, Passing structures to functions. Unions: Declaration Uses. Enumerated data types, type def, Bit wise operators, File Handling: The file Pointers, file accessing functions (fopen, fclose, putc, gete, fprintf); argc and argv; File opening modes: Text mode, Binary mode.

(No. of Lectures: 15)

References:

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<thead>
<tr>
<th>No.</th>
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<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>Rajaraman, V.</td>
<td>Fundamentals of Computers, PHI, 2010</td>
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<td>3</td>
<td>Norton Peter</td>
<td>Introduction to Computers, TMH, 2010</td>
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<td>7</td>
<td>Balaguruswami</td>
<td>Programming with C Language by C, Tata McGraw Hill, New Delhi</td>
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<td>8</td>
<td>Coachin, Stefan G.</td>
<td>Programming in C</td>
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</table>

Paper - C: Practical on Paper – A

Total Periods : 60

(6 Periods/week)

Max. Marks: 25

Exam Hours: 3

Paper - C (Practical)

- Introduction to various components of computer. Usage of printer & other components. Physical inspection of IBM PC and internal cards
- Developing Programs in C Language,
- Write programs in ‘C’ language to demonstrate -
  - The use of constants, Variables, operators and expressions
  - Input and output statements, library functions
  - Conditional statements: if-else, nested-if, switch
  - Branching statements: Jump statements, break, continue, goto
  - Loops: while, do-while, for
  - Functions, recursive functions
  - Call – by value/reference
  - Arrays - Single and Multidimensional Array
  - String handling
  - Pointers, passing pointers to functions, pointers and arrays
  - Structure – accessing members, nested structures, structure with pointers
  - File handling, Creating and processing data files
  - Use of command line arguments
SECOND SEMESTER

Paper - B: Application Software

Total Periods: 60                                          Max. Marks: 65
(6 Periods/week)                                          Exam Hours: 3

Note:

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

Object: This course enable the students to get familiar with Disk Operating System, Windows Operating System and Application Software for Word processing, Spreadsheet, Presentation and Data Base Management.

SECTION - A

   (No. of Lectures : 15)

SECTION - B

3. MS -Word: Basics of Word Processing; Opening, Creating, Saving, Printing and Quitting Documents, Using the Interface (Menu Toolbars), Editing Text (Copy, Delete, Move), Finding and Replacing Text, Spell Check, Autocorrect; Auto text, Character formatting, Page formatting; Document Enhancement: Adding Borders and shading, Adding Headers and Footers, Setting up Multiple columns, Sorting blocks, Adjusting Margins and Hyphenating Documents, Creating Master Document, Creating Data Source, Merging Documents, Using Mail merge feature for labels and envelopes; Inserting Pictures, Tables, Working with equations.
   (No. of Lectures: 15)
4. MS - EXCEL: Worksheet overview, Row, Column, Cells, Menus, Creating Worksheet, Opening, Saving, printing worksheet; Calculations, Auto fill, working with Formulae, Data formatting (number formatting, date formatting), Working with Ranges, Establishing Work-sheet links; creating, sorting and filtering Data Base; creating chart, adding Titles, Legends etc. to charts, Printing Charts, creating Macros, Recording Macros, Running Macros, Assigning Macros to Buttons, Functions (Statistical, financial, Mathematical, string, date and time).
   (No. of Lectures: 15)

SECTION - C

5. MS - PowerPoint: Creating, saving, printing presentations; selecting design templates, animations and transitions, Auto content Wizard.

6. MS - Access: Introduction to database, Creating database using Wizard or from scratch, creating tables using wizard, entering data, using design view, saving, inserting, editing, Changing properties of fields, setting primary key.
   (No. of Lectures: 15)

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Paper - D:  Practical on Paper – B

Total Periods: 60
(6 Periods/week)

Max. Marks: 25
Exam Hours: 3

- Writing batch files for various purposes.
- Modifying config.sys

- MS Word: Formatting, Spelling Checking, Mail-merging of documents
- Preparation of presentation on topics covered in paper - B

Note: Paper will be set at the time of examination. Due weightage may be given to the practical note-book and Assignments in evaluation.
THIRD SEMESTER

Paper – A : Web-Based Applications

Total Periods: 60                                        Max. Marks: 65
(6 Periods/week)                                          Exam Hours: 3

Note :

i. The Question Paper will consist of Four Sections.

ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.

iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.

iv. All questions carry equal marks unless specified.

Objective: This course enables students to create web pages using scripting language (HTML, Java script) & the Java prog. language.

SECTION – A


2. HTML: Introduction to HTML, Building blocks of HTML, lists, links, images, tables, frames, forms, Introduction to cascading style sheets (CSS) defining and applying CSS.

   (No. of Lectures : 15)

SECTION – B

3. Java Script: Features, tokens, data types, variables, operations, control constructs, strings arrays, functions, core language objects, client side objects, event handling. Applications related to client side form validation.

4. Fundamentals of Java: Java Vs. C++, Byte code, Java virtual machine, constants, variables, data types, operators, expressions, control structures, defining class, creating objects, accessing class members, constructions, method overloading.

   (No. of Lectures : 15)

SECTION – C

5. Arrays, String handling Inheritance: Basics, member access, using super to call super class constructors, creating a multi level hierarchy, method overriding, Dynamic method dispatch, using abstract classes, using Final.


   (No. of Lectures : 15)
SECTION – D

7. Multi-threaded Programming: The Java Thread model, Thread priorities, synchronizations, messaging. The thread class and runnable Interface, The Main Thread: Creating a Thread, Implementing Runnable, Extending Thread, creating Multiple Threads, Thread Priorities; synchronizations: Methods, statements, Inter Thread communication, Deadlock, suspending, Resuming and stopping Threads, Applet fundamentals

8. I/O Basics: streams, the predefined streams; Reading console Input, Writing console output. The print writer class; Reading and Writing files

(No. of Lectures : 15)

References:

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<td>4.</td>
<td>Bayross, Ivan</td>
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Write programs in Java to demonstrate:

- Implementation of Classes and Objects
- Constructors and their types
- Inheritance – calling super class constructors, abstract classes, multilevel hierarchy
- Method overloading and overriding
- String handling
- Creating Packages and Interfaces: Defining an Interface, Importing packages
- Implementation and handling of built-in and user defined exceptions
- I/O streams
- Applet programming using AWT controls
- Event handling

Creation of WebPages using HTML, DHTML, JavaScript:

- Creating Time-Table of a student using tables
- Creating various lists using list tags
- Preparing Bio-Data using tables, images, formatting tags, lists
- Create a simple website using frames and other features of HTML
- Calculate expression using eval function
- Form Validation Using JavaScript event Handlers and functions

**Note:** Paper will be set at the time of examination. Due weight age may be given to the practical note-book and Assignments in Evaluation.
FOURTH SEMESTER

Paper – B :  Programming in C++

Total Periods: 60  Max. Marks: 65
(6 Periods/week)  Exam Hours: 3

Note :

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

Objective: The course enables the students to get familiar with the features of Object Oriented programming language and develop programs using different concepts.

SECTION - A

1. Concepts of Object Oriented Programming: Object, Class, Encapsulation, Data hiding, Inheritance, Polymorphism. Analysis and design of system using object oriented approach Structure of a C++ Program, Include files, Declaration of an object, main function, I/O streams. Classes and Objects Class Declaration: Data Members, Member Functions, Private and Public members, data hiding and encapsulation, Arrays within a class.

   (No. of Lectures: 15)

SECTION - B

2. Class Function Definition: Member Function definition inside the class declaration and outside the class declaration, Scope resolution operator, Private and Public member function, Nesting of Member functions. Creating Objects, Accessing class data members, Accessing member functions, Arrays of Objects, Objects as function arguments: Pass by value, Pass by Reference, Pointers to Objects.

   (No. of Lectures: 15)

SECTION - C

3. Constructors Declaration and Definition, Default Constructors, Parameterized Constructors, Copy Constructors. Destructors: Definition and use, Function Overloading, Operator overloading, Inheritance - Extending Classes, Concept of inheritance, Base class, Derived class, Defining derived classes, Visibility modes: Private, Public, Protected; Single inheritance: Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.

   (No. of Lectures : 15)

SECTION - D

4. Files and Streams: Text and binary streams, The stream class hierarchy, Processing files, declaring files, opening files using open() function or constructor function, closing files, String I/O, Sequential and random Access, File updation

   (No. of Lectures : 15)
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Total Periods: 60                                        Max. Marks: 25
(6 Periods/week)                                       Exam Hours: 3

Write programs in C++ to demonstrate:

- The use of C++ operators, tokens and keywords.
- Input and output statements
- Control statements
- Functions (Function overloading, inline functions, friend functions).
- Classes (Object Declaration, Private and Public members, defining member functions)
- Data hiding and encapsulation
- Static data members and member functions
- Array of objects
- Objects as function arguments
- Implementation of Constructor and Destructor.
- Operator Overloading (using member function and friend function)
- Inheritance (using visibility modes: Private, public, protected)
- All types of inheritance (multiple, multilevel, hybrid, hierarchical)
- Polymorphism (pointers to objects, Virtual Functions)
- File operations using classes

Note: Paper will be set at the time of examination. Due weightage may be given to the practical note-book and Assignments in Evaluation.
Third Year

Paper –A: Programming with VB and Oracle

Total Periods: 90                                            Max. Marks: 55
(3 Periods/week)                                            Exam Hours: 3

Note:

i. The Question Paper will consist of Four Sections.

ii. Examiner will set total of NINE questions comprising TWO questions from each Section and ONE compulsory question of short answer type covering whole syllabi.

iii. The students are required to attempt ONE question from each Section and the Compulsory question.

iv. All questions carry equal marks unless specified.

Objective: The course is designed to enable the students to develop applications using event driven programming with VB (as front and) and oracle (at back end).

SECTION - A

1. Visual Basic IDE: An Overview, the new project dialog, IDE elements and features, starting a new project or opening an existing one, saving your projects, setting environment, editor, and general options, adding different modules to a project, the edit menu; the toolbox: Adding control to forms, adding components to the toolbox, the properties window, the project explorer, the form layout, the format menu, making effective use of the code window; the object browser, the menu editor, debugging tools, compiling executables.

2. Visual Basic Language overview: VB code lines and comments, Identifiers, constants and Variables, using option explicit, numbers, operators, control loops and conditional statements, Modules, subroutines and Functions, passing Arguments, programmer-Defined Structures, Arrays.

(No. of Lectures : 22)

SECTION - B

3. Event-Driven Programming: Working with Visual Basic Source Files, using the MSGBOX Function when an Event is Fired, Adding code to a form Click Event; Properties and Methods in Visual Basic: Properties, Methods, Event Firing order: Form Startup Events, From User Response Events, Form Shutdown Events; The MSG-Box Function and Query Unload, Adding Code to Form and Control events, Basic Concepts to Object-oriented Programming, Encapsulating VB Dialog; Understanding Class Modules: Properties, Methods, Using class Properties and Methods, Creating, Firing and Handling.

4. Database Connectivity: Introduction to access data sources through ODBC, OLEDB and ADO

(No. of Lectures : 23)

SECTION – C

5. Fundamentals: Introduction to DBMS, Architecture, Categorization of DBMS systems, Network, Hierarchical and Relational databases, The 12 Rules (Codd’s Rule) for an RDBMS, Normalization, Oracle Server and Oracle Database, Oracle Products. Introduction to SQL, Oracle Data Types, Starting SQL Plus, Querying database tables, Conditional
retrieval of rows, Working with Null Values, Matching a pattern from a table, ordering the result of a Query Aggregate Functions, Grouping the Result of a Query, ROLLUP Operation: Getting Sub Totals, CUBE Operation: Getting Cross Tabs, Command Summary of SQL Plus Editor.


(No. of Lectures: 22)

SECTION - D

7. Data Definition Language (DDL): Creating Tables, Creating a Table with data from Another table, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) from a Table, Dropping a Column, Views, Manipulating the Base table(s) through views, Rules of DML, Statements on Join Views, Dropping a View, Inline Views, Materialized Views. Database Security and Privileges, Grant and Revoke Command, Privileges Management, Enhancing Performance, Sequences, COMMIT and ROLLBACK.


(No. of Lectures: 23)

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<tr>
<td>1.</td>
<td>Harold Davis</td>
<td>Visual Basic Secrets.</td>
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<td>Gurewich, Natham and Gurewich, Ori</td>
<td>Visual Basic in 21 days</td>
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<td>Cornell, G</td>
<td>Visual Basic 6 from the Groundup/TMH.</td>
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<td>Schaum 's</td>
<td>Outlines VB</td>
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<td>Evangelos, Petroutsor</td>
<td>Mastering VB 6.0, BPB</td>
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<td>7.</td>
<td>Jerke, N.</td>
<td>The Complete Reference VB 6.0, TMH</td>
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<td>Cornell, Gary</td>
<td>Visual Basic from the Ground up, TMH</td>
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<td>Kevin, Loney</td>
<td>The Complete Reference Oracle Database 10g, TMH</td>
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Note:

i. The Question Paper will consist of Four Sections.

ii. Examiner will set total of 

iii. The students are required to attempt 

iv. All questions carry equal marks unless specified.

Objective: The course enable the students to get familiar with major functions of O.S. and also covers a case study of O.S. using LINUX.

SECTION – A

1. Operating System: Introduction to various categories of software’s, OS and its functions. Interaction of Operating System with hardware and user programs, Multi-user, Multitasking, Multiprocessing and Real time operating systems, Parallel Systems, Distributed Systems

2. Memory management: Logical vs Physical address space, Swapping, Paging, and Segmentation, Virtual Memory-Demand paging, Page replacement algorithms

(No. of Lectures : 22)

SECTION – B


(No. of Lectures :23)

SECTION – C


5. Device Management: Disk structure, disk scheduling, FCFS, SSTF, SCAN, C-SCAN and LOOK scheduling algorithms, Control of various devices. Device drivers, Interrupt driven and poll driven data transfers.

(No. of Lectures :22)
SECTION – D

6. Linux: Introduction to Linux, Linux commands: File and directory management, process management; communication management; managing accounts, backup and restore, shell and kernel, security mechanism.

(No. of Lectures : 23)

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<tr>
<td>2.</td>
<td>Norton, P.</td>
<td>Complete guide to LINUX, Techmedia</td>
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<td>8.</td>
<td>Abraham Silberschatz &amp; Peter B Galvin</td>
<td>OS Concepts, addison Wesley</td>
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Paper – C: Minor Project Report based on VB and Oracle

Total Period: 6 per week                               Max. Marks: 80

Development of an Information System using VB and Oracle

The evaluation will be done on the basis of Project report submitted by the candidate and Viva- Voce examination.

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