SAURASHTRA UNIVERSITY

RAJKOT – INDIA

CURRICULAM

FOR

B.Sc.(IT & CA)

Bachelor of Science (I.T. & C.A.)

(Semester III and Semester IV)

Effective From June – 2017

B.Sc.(IT & CA) (Semester – III)			
SR.NO	**SUBJECT**	**NO. OF LECT. PER WEEK**	**CREDIT**
1	**CS – 13** SAD, Software Quality Assurance and Testing	5	5
2	**CS – 14** C++ and Object Oriented Programming	5	5
3	**CS – 15** RDBMS Using Oracle	5	5
4	**CS –16** Content Management System using Joomla	5	5
5	**CS – 17** Practical (Based On CS-13, CS-14)	5	5
6	**CS – 18** Practical (Based On CS-15, CS-16,)	5	5
Total Credit			30

Note:
1. Credit of each subject is 5. Total credit of semester is 30.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical paper are 100. No internal examination marks in practical papers.

CS – 13 : SAD, Software Quality Assurance and Testing				
No.	Topics	Details	Marks weight In %	Min Lect.
1.	System Analysis & Design, Software Engineering & Concept of Quality Assurance	• Definitions: System, Subsystem, Business System, Information System (Definitions only) • Systems Analyst (Role: Information Analyst, Systems Designer & Programmer Analyst) • SDLC • Fact – finding techniques (Interview, Questionnaire, Record review and observation) • Tools for Documenting Procedures and Decisions Decision Trees and Decision Tables • Data Flow analysis Tool DFD (context and zero level) and Data Dictionary • Software Engineering (Brief introduction) • Introduction to QA • Quality Control (QC) • Difference between QA and Q • Quality Assurance activities	20	15

| 2 | Basics of Software Testing, Types of Software Testing, Verification and Validation | • 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
  • Walthrough
  • Technical Review
  • Inspection
• Dynamic Testing
• Test levels
  • Unit Testing
  • Integration Testing
  • System Testing
  • Acceptance Testing
Techniques of software Testing
• Black Box Testing
  • Equivalence Partitioning
  • Boundary Data Analysis
  • Decision Table Testing
  • State Transition Testing
• White Box Testing
  • Statement testing and coverage
  • Decision testing and coverage
• Grey Box Testing
• Nonfunctional Testing
  • Performance Testing
  • Stress Testing
  • Load Testing
  • Usability Testing
  • Security Testing | 20 | 16 |

3	Software Development Life Cycle Models and Automated Testing	- Waterfall Model - Iterative Model - V-Model - Spiral Model - Big Bang Model - Prototyping Model - Introduction to Automated Testing - Concept of Freeware, Shareware, licensed tools - Theory and Practical Case-Study of Testing Tools - Win runner - Load runner - QTP - Rational Suite	20	10
4	Project Economics, Project scheduling and Tracking	- Concepts of Project Management - Project Costing based on metrics - Empirical Project Estimation Techniques. - Decomposition Techniques. - Algorithmic methods. - Automated Estimation Tools - Concepts of project scheduling and tracking - Effort estimation techniques - Task network and scheduling methods - Timeline chart - Pert Chart - Monitoring and control progress - Graphical Reporting Tools	20	11

5	CAD Project Management Tool UML	• MS – VISIO for designing & Documentation • MS – Project for controlling and Project Management • UML designing and skill based tools Overview of ◆Class Diagram ◆Use Case Diagram ◆Activity Diagram	20	8
		TOTAL	**100**	**60**

Students seminar   - 5 Lectures.
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures.
TOTAL LECTURES 60+15=75

Reference Book

1. Analysis & Design of Information System - James A. Senn.
2. Pankaj Jalote, "Software Engineering – A Precise Approach", Wiley India
3. UML Distilled by Martin Fowler, Pearson Edition, 3rd Edition
4. Fundamentals of Software Engineering – RajibMall (PHP)
5. Software Engineering – A Practitioner's Approach – Pressman
6. UML – A Beginner's Guide –Jasson Roff – TMH
7. Roger Pressman , "Software Engineering"
8. http://en.wikipedia.org/wiki/Software_testing
9. http://www.onestoptesting.com/
10. http://www.opensourcetesting.org/functional.php

No	Topics	Details	Marks weight in %	App. Lect.
CS - 14 : C++ and Object Oriented Programming					

No	Topics	Details	Marks weight in %	App. Lect.

1	**Principles of object oriented programming , Tokens, expressions and control statements**	• Procedure – oriented programming
		• Object oriented programming paradigm
		• Basic concepts of object oriented Programming
		• Benefits of object oriented programming
		• Application of object oriented programming
		• What is c++?
		• Application of c++
		• Input/output operators
		• Structure of c++ program
		• Introduction of namespace
		• Tokens :
		keywords, identifiers, basic data types, user- defined types, derived data types, symbolic constants, type compatibility, declaration of variables, dynamic initialization of variables, reference variables
		• Operators in C++:
		scope resolution operator, member referencing operator, memory management operator, manipulators, type cast operator.
		• Expression :
		Expression and their types, special assignment operator, implicit conversions, operator precedence
		• Control structures
		  ♦ Conditional control structure :-
		  simple if, if...else , nested if else, switch etc.
		    ♦ Looping control structure:-
		    for, while , do...while
			15	11

| 2 | Functions in C++ Classes and Objects | • The main function
• Function prototype
• Call by reference
• Return by reference
• Inline function
• Default arguments
• Const arguments
• Functions overloading
• Adding C Functions turbo C++
• C structures revisited
• Specifying a class
• Local Classes
• Nested Clases
• Defining member functions, nesting of Member functions, private member function, making outside function inline
• Arrays within a class
• Memory allocation for objects
• Static data member
• Static member functions
• Arrays of objects
• Objects as function arguments
• Friendly functions
• Returning objects
• Const member function
• Pointer to members | 20 | 13 |

| 3 | Constructor and Destructor, Operator overloading and type conversion | • Characteristics of constructor
• Explicit constructor
• Parameterized constructor
• Multiple constructor in a class
• Constructor with default argument
• Copy constructor
• Dynamic initialization of objects
• Constructing two dimensional array
• Dynamic constructor
• MIL , Advantage of MIL
• Destructors
• Concept of operator overloading
• Over loading unary and binary operators
• Overloading of operators using friend Function
• Manipulation of string using operators
• Rules for operator overloading
• Type conversions.
• Comparison of different method of conversion | 20 | 11 |
| 4 | Inheritance Pointer, Virtual functions, and Polymorphism, RTTI | • Defining derived classes
• Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)
• Virtual base class & Abstract class
• Constructors in derived class
• Application of Constructor and Destructor in inheritance
• Containership, Inheritance V/s Containership
• Pointer to Object
• Pointer to derived class
• this pointer
• Rules for virtual function
• Virtual function and pure virtual function.
• Default argument to virtual function
• Run Time Type Identification | 20 | 10 |

| 5 | Console I/O operations, Working with Files, Exception handling, Introduction to Template STL | • C++ streams
• C++ stream classes
• Unformatted and formatted I/O operations
• Use of manipulators.
• File stream classes
• Opening and closing a file
• Error handling
• File modes
• File pointers
• Sequential I/O operations
• Updating a file (Random access)
• Command line arguments
• Overview of Exception Handling
• Need for Excception Handling
• various components of exception handling
• Overview of Exception Handling
• Introduction to templates
• Class templates
• Function templates
• Member function templates
• Overloading of template function
• Non-type Template argument
• Primary and Partial Specialization
• Introduction to STL
• Overview of iterators, containers | 20 | 15 |
| | **TOTAL** | | 100 | 60 |

Students seminar - 5 Lectures.
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures.
TOTAL LECTURES 60+15=75
Reference Books:

1. Complete Reference C++ by Herbert Schildt McGraw Hill Publications
2. Computer Science- A Structured approach using C++ by Forouzan, Gilburg, THOMSON
3. Object Oriented Programming in C++ - E.Balagurusamy, BPB
4. Object Oriented programming in C++ by Robert Lafore, Pearson Education
5. Mastering C++ - Venugopal
6. The C++ Programming Language by Bjarne Stroustrup, Pearson Education
7. Object Oriented Programmin in C++ - Robaret Laphore
8. Let us C++ - Yashvant Kanitkar, BPB

No.	Topics	Details	Marks weight In %	Min Lect.
		CS – 15 : RDBMS Using Oracle		
1	DBMS Overview, SQL, SQL*Plus	• Introduction to DBMS • Introduction to RDBMS • Dr.E.F.Codd Rules • Importance of E.R.Diagram in Relational DBMS. • Normalization • Introduction to SQL • SQL Commands and Datatypes • Introduction to SQL*Plus • SQL*Plus formatting commands • Operator and Expression • SQL v/s SQL*Plus	20	8
2	Managing Tables and Data	• Creating , Altering & Dropping tables • Data Manipulation Command like • Insert, update, delete • Different type of contstrainst and applying of constration • SELECT statement with WHERE, GROUP BY and HAVING,ROLLUP AND CUBE, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE • Join (Inner join ,outer join, self join) • subquery, minus, intersect, union • Built in functions • Numeric Function abs, ceil, cos, decode, exp, floor, greatest, least, log, log10, max, min, rem, round , sign, sin, sinh, sqrt, tan, trunc • Character Function chr, concat, initcap, lower, lpad, ltrim, replace, rpad, rtrim, soundex, substr, treat, trim, upper • Date Function add_months, last_day, months_between, next_day, round (date), sysdate, systimestamp, trunc (date), to_date, to_char • Aggregate function Sum, Count, AVG, MAX, MIN • General Functions COALESCE, CASE WHEN, DECODE	20	10

| 3 | Other ORACLE Database Objects, Data Control And Transaction Control Command, Concurrency control using lock | View Sequence Synonyms, Database Links Index B*Tree Indexes Bitmap Indexes Function-Based Indexes Application Domain Indexes Cluster, Snapshot Creating user & role Grant, Revoke command What is transaction? Starting and Ending of Transaction Commit, Rollback, SavePoint What Are Locks? Locking Issues Lost Updates Pessimistic Locking Optimistic Locking Blocking Deadlocks Lock Escalation Lock Types DML Locks DDL Locks Latches Manual Locking and User-Defined Locks | 20 | 15 |
| 4 | Introduction to PL/SQL and Advanced PL/SQL | SQL v/s PL/SQL PL/SQL Block Structure Language construct of PL/SQL (Variables, Basic and Composite Data type, Conditions looping etc.) %TYPE and %ROWTYPE Using Cursor(Implicit, Explicit) Exception Handling Creating and Using Procedure, Functions, Package, Triggers Creating Objects, Object in Database-Table PL/SQL Tables, Nested Tables, Varrays | 20 | 18 |

| 5 | Oracle Database Structure and Storage, Database Resource Management and Task Scheduling | • Instance Architecture
o Database Processes
o Memory Structure.
o Data files
• Creating & Altering Database
• Opening & shutdown Database
• Initialization Parameter
• Control Files, Redo Logs files
• Tablespace (Create, Alter, Drop)
• Rollback Segment (Create, Alter) (System & Transaction RBS)
• Oracle Blocks
• Import
• Export
• SQL*Loader
• Managing Automated Database Maintenance Tasks
• Managing Resources with Oracle Database Resource Manager
• Oracle Scheduler Concepts
• Scheduling Jobs with Oracle Scheduler
• Administering Oracle Scheduler | 20 | 9 |
| | Total | | 100 | 60 |

Students seminar   - 5 Lectures.
Expert Talk   - 5 Lectures (Managing a Multitenant Environment using Oracle 12c)
Students Test   - 5 Lectures.
TOTAL LECTURES 60+15=75

Reference Books:

1. Oracle Database 12c The Complete Reference (Oracle Press) by Bob Bryla , Kevin Loney – Oracle Press
2. Oracle Database 12c SQL – Jason Price – Oracle Press
3. Oracle Database 12c PL/SQL Programming by McLaughlin – Oracle Press
4. SQL,PL/SQL The programming - Lang.Of Oracle Ivan Bayross - BPB

CS – 16 : Web development using Joomla! CMS				
No.	Topic	Details	Marks weight In %	Min. Lect.
1	Object Oriented Programming and MVC Structure	- Advance Concept of OOP • Class • Properties • Class Constants • Autoloading Classes • Constructors and Destructors • Visibility • Object Inheritance • Scope Resolution Operator (::) • Static Keyword • Class Abstraction • Object Interfaces • Namespace • Interface • Traits • Anonymous classes • Overloading • Object Iteration • Magic Methods • Final Keyword • Object Cloning • Comparing Objects • Type Hinting • Late Static Bindings • Objects and references • Object Serialization - Mysql Database handling with pdo (insert, update, select, delete)	20	12
2	Introduction	- What is Content Management System (CMS)? - Introduction of Joomla! [1] - Joomla! Core Features [2] - Advantages & Disadvantages of Joomla! CMS - Understand How Joomla! Works	20	12
	Installation & Configuration	- Technical Requirements for Joomla! [4] - Installation of Joomla! [5] - Joomla! Directory & file structure. - Dashboard overview		

		- How to add, edit, delete, publish and batch process category and content. - User Manager, Groups and Access Levels. - Global Configurations (Site, System, Server, Permissions and Text Filters) - Joomla! Update • Liver Update • Upload & Update - Understanding Banners, Contacts, News Feed and Smart Search. - Database Structure		
3	Templates	- Understanding Joomla! templates [6] - Typical Template Directory Structure - Template directories - Example structure with files - Template files - XML Format - Basic Details - Folder Structure - Module Positions - Languages - Parameters	20	12
	Component	- What is a Joomla! Component? [7] - Introduction to MVC (Model, View, Controller) - Understanding Joomla! Component Framework - Accessing a Joomla! Component - Joomla! MVC Basic Directory Structure		
	Modules	- What is Joomla! Modules? [8] - How to install and Publish modules. - Understanding Module Positions. - Using core joomla! Modules.		
	Plugins	- What is plugin? [9] - How to install and enable plugin. - Plugin Types (Authentication, Captcha, Content, Editors, Extensions, Finder, Quick Icons, System, User) - Plugin Events for each plugin type - Custom Plugin Types and Events		

4	Basic Development Developing a MVC Component	- Introduction [10] [11] - Development of a Basic Component - Adding a view to the site part - Adding a menu type to the site part - Adding a model to the site part - Adding a variable request in the menu type - Using the database - Basic backend	20	12
	Module	- Introduction [12] - File Structure - Creating mod_helloworld.php - Creating helper.php - Creating tmpl/default.php - Creating mod_helloworld.xml - Conclusion		
	Developing Plugin	- Introduction [13] - File structure - Creating the Installation file - Creating the plugin - Using plugin in your code		
	Developing Template	- Introduction [14] - Setting up a directory structure - Creating a basic templateDetails.xml file - Creating a basic index.php file - 1 Begin - 2 Head - 3 Body Section - 3.1 Module Positions - 4 End - 5 Custom Images - 6 Custom CSS - Testing the template - Packaging the template for installation - Conclusion		
5	Advanced Development	Advance Component Development [10] [11] - Adding language management - Adding backend actions - Adding decorations to the backend - Adding verifications - Adding categories - Adding configuration	20	12

		- Adding ACL
		Supporting plugins in your component [15]
		- Background
		  - Joomla! Observer Implementation
		  - Why Become A Communicator
		- Implementation
		  - How To Become A Communicator
		  - How To Trigger Events
		- Caveats
		  - You Are Defining An API
		- Load The Right Plugin Group		

	Joomla! Framework	- What is the Joomla! Framework? [16] - Get the Sample Application - Why build a Joomla! Framework? - What is the Framework good for? - Framework Architecture - What does the Joomla! Framework mean for you? - Why should I consider using the Joomla! Framework? - I know PHP already. Why should I use this framework? - As a Joomla! CMS User. How will I be affected?		
	Joomla! 4 and Future	- What is Joomla! 4 [17] - Why the transformation in Joomla 4? - Improvements in Joomla admin workflow. - An evolution in Joomla code. - Orthogonal Component Structure. - Strict MVC Implementation. - Frontend and Backend Template Improvements using Bootstrap 4. - Joomla! 4 and Joomla! Framework.		
		TOTAL :	100	60

Students seminar   - 5 Lectures.
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures.
TOTAL LECTURES 60+15=75

References

1. https://www.joomla.org/about-joomla.html
2. https://www.joomla.org/core-features.html
3. https://docs.joomla.org/Portal:Beginners
4. https://downloads.joomla.org/technical-requirements
5. https://docs.joomla.org/J3.x:Installing_Joomla
6. https://docs.joomla.org/Understanding_Joomla!_templates

7. https://docs.joomla.org/Absolute_Basics_of_How_a_Component_Functons#Joomla.21_Component_Framework_Explained

8. https://docs.joomla.org/Module
9. https://docs.joomla.org/Plugin
10. https://docs.joomla.org/J3.x:Developing_an_MVC_Component
11. https://github.com/joomla-extensions/boilerplate
12. https://docs.joomla.org/J3.x:Creating_a_simple_module/Developing_a_Basic_Module
13. https://docs.joomla.org/J3.x:Creating_a_Plugin_for_Joomla
14. https://docs.joomla.org/Creating_a_basic_Joomla!_template
15. https://docs.joomla.org/Supporting_plugins_in_your_component
16. https://framework.joomla.org/
17. https://developer.joomla.org/news/620-joomla-4-working-group.html

Training Videos for reference

https://community.joomla.org/joomla-training.html

Books

1. Joomla! 3 Beginner's Guide Second Edition by Eric Tiggeler - Year 2015
2. Programming Joomla Plugins by Jisse Reitsma - Year 2015
3. Joomla! 3 Template Essentials by Pawel Frankowski - Year 2015
4. Foundations of Joomla! by B. M. Harwani - Year 2015

Official Joomla! Books from Joomla! Press

1. Joomla!® 3 Explained: Your Step-by-Step Guide by Stephen Burge
2. The Official Joomla! Book (2nd Edition) by Jennifer Marriott
3. Joomla! Programming by Mark Dexter and Louis Landry
4. Joomla! Templates by Angie Radtke

CS-17 : Practical Based On CS – 13 & CS – 14		
Sessions	Topics	Marks
I	♦ CS – 13	50
II	♦ CS – 14	50

Note : Each session is of 3 hours for the purpose of practical examination.

CS-18 : Practical And Viva Based On CS – 15 & CS – 16		
Sessions	Topics	Marks
I	♦ CS – 15	50
II	♦ CS – 16	50

Note : Each session is of 3 hours for the purpose of practical examination.

B.Sc.(I.T. & C.A.) (Semester – IV)			
SR.NO	**SUBJECT**	**NO. OF LECT. PER WEEK**	**CREDIT**
1	**CS – 19** Programming with JAVA	5	5
2	**CS – 20** Programming with C#	5	5
3	**CS – 21** Network Technology and Administration	5	5
4	**CS –22** Operating Systems Concepts With Unix / Linux	5	5
5	**CS – 23** Practical (Based On CS-19, CS-22)	5	5
6	**CS – 24** Practical (Based On CS-20)	5	5
Total credit			30

Note:
1. Credit of each subject is 5. Total credit of semester is 30.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical paper are 100. No internal examination marks in practical papers.

No	Topics	Details	Marks weight In %	Min Lec.
**CS – 19 PROGRAMMING WITH JAVA**				
1	History, Introduction and Language Basics, Classes and Objects	• History and Features of Java • Java Editions • JDK, JVM and JRE • JDK Tools • Compiling and Executing basic Java Program • Java IDE (Netbeans and Eclipse) • Data Type (Integer, Float, Character, Boolean) • Java Tokens (Keyword, Literal, Identifier, Whitespace, Separators, Comments, Operators) • Operators (Arithmetic, Relational, Boolean Logical, Bitwise Logical, Assignment, Unnary, Shift, Special operators) • Type Casting • Decision Statements (if, switch) • Looping Statements (for, while, do..while) • Jumping Statements (break, continue, return) • Array (One Dim., Rectangular, Jagged) • Command Line Argument Array • OOP Concepts (Class, Object, Encapsulation, Inheritance, Polymorphism) • Creating and using Class with members • Constructor • finalize() method • Static and Non-Static Members • Overloading (Constructor & Method) • VarArgs	20	8

| 2 | Inheritance, Java Packages | - Universal Class (Object Class)
- Access Specifiers (public, private, protected, default, private protected)
- Doing Inheritance
- Constructors in inheritance
- Method Overriding
- Interface
- Nested and Inner Class
- Abstract and Final Class
- Normal import and Static Import
- Introduction to Java API Packages and imp. Classes
  ○ java.lang
  ○ java.util
  ○ java.io
  ○ java.net
  ○ java.awt
  ○ java.awt.event
  ○ java.applet
  ○ java.swing
- java.lang Package Classes (Math, Wrapper Classes, String, String Buffer)
- java.util Package Classes (Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer)
- Creating and Using UserDefined package and sub-package | 20 | 15 |

| 3 | Exception Handling and Threading Streams (Input and Output) | - Introduction to exception handling
- try, catch, finally, throw, throws
- Creating user defined Exception class
- Thread and its Life Cycle (Thread States)
- Thread Class and its methods
- Synchronization in Multiple Threads (Multithreading)
- Deamon Thread, Non-Deamon Thread
- Stream and its types (Input, Output, Character, Byte)
- File and RandomAccessFile Class
- Reading and Writing through Character Stream Classes (FileReader, BufferedReader, FileWriter, BufferedWriter)
- Reading and Writing through Byte Stream Classes (InputStream, FileInputStream, BufferedInputStream, DataInputStream, OutputStream, FileOutputStream, BufferedOutputStream, DataOutputStream)
- StreamTokenizer Class
- Piped Streams, Bridge Classes : InputStreamReader and OutputStreamWriter
- ObjectInputStream, ObjectOutputStream | 20 | 13 |
| 4 | Applets, Layout Managers | - Introduction to Applet
- Applet Life Cycle
- Implement & Executing Applet with Parameters
- Graphics class
- FlowLayout
- BorderLayout
- CardLayout
- GridLayout
- GridBagLayout with GridBagConstraints
- Intro. to BoxLayout, SprigLayout, GroupLayout
- Using NO LAYOUT Manager | 20 | 9 |

| 5 | GUI using SWING, Event Handling | - Introduction to AWT and Swing
- Difference Between AWT and Swing Components
- Swing Components
  o JFrame, JPanel
  o JLabel, JButton, JRadioButton, JCheckBox
  o JTextField, JPasswordField, JTextArea
  o JScrollBar, JComboBox, JList
    o Menus (JMenuBar, JMenu, JMenuItem)
- Introduction to Event Handling
- Event Delegation Model
- Event Packages
  o AWT Event Package
  o Swing Event Package
- Event Classes (ActionEvent, ItemEvent, FocusEvent, MouseEvent, MouseWheelEvent, TextEvent, WindowEvent, etc.)
- Listener Interfaces (ActionListener, ItemListener, FocusListener, KeyListener, MouseListener, MoutMotionListener, TextListener, WindowListener, etc.)
- Adaptor Classes (FocusAdaptor, KeyAdaptor, MouseAdaptor, MouseMotionAdaptor) | 20 | 15 |
| | | **Total** | **100** | **60** |

Students seminar   - 5 Lectures.
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures.
TOTAL LECTURES 60+15=75
Reference Books:
1. Java: A Beginner's Guide – Jul 2014 by Herbert Schildt
2. Java Programming (Oracle Press) by Poornachandra Sarang
3. Java The Complete Reference, 8th Edition –by Herbert Schildt
4. Ivor Horton's "Beginning Java 2" JDK 5 Edition, Wiley Computer Publishing.
5. Ken Arnold, James Gosling, David Holmes, "The Java Programming Language", Addison-Wesley Pearson Education.
6. Cay Horstmann, "Big Java", Wiley Computer publishing (2nd edition – 2006).
7. James Gosling, Bill Joy, Guy Steele, Gilad Bracha, "The Java Langauge Specifications", Addison-Wesley Pearson Education (3rd edition) Download at http://docs.oracle.com/javase/specs/

CS – 20 PROGRAMMING WITH C#				
No	Topics	Details	Marks weight In %	Min Lec.
1	.NET Framework and Visual Studio IDE, Language Basics	Introduction to .NET Framework Features / Advantages CLR, CTS and CLS BCL / FCL / Namespaces Assembly and MetaData JIT and types Managed Code and Unmanaged Code Introduction to .NET Framework and IDE versions Different components (windows) of IDE Types of Projects in IDE (Console, Windows, Web, Setup, etc.) Data Types (Value Type & Reference Type) Boxing and UnBoxing Operators (Arithmetic, Relational, Bitwise, etc.) Arrays (One Dimensional, Rectangular, Jagged) Decisions (If types and switch case) Loops (for, while, do..while, foreach)	20	11

2	**Class and Inheritance Property, Indexer, Pointers, Delegates, Event, Collections**	Concept of Class, Object, Encapsulation, Inheritance, Polymorphism Creating Class and Objects Methods with "ref" and "out" parameters Static and Non-Static Members Constructors Overloading Constructor, Method and Operator Inheritance Sealed Class & Abstract Class Overriding Methods Interface inheritance Creating and using Property Creating and using Indexer Creating and using Pointers (unsafe concept) Creating and using Delegates (Single / Multicasting) Creating and using Events with Event Delegate Collections (ArrayList, HashTable, Stack, Queue, SortedList) and their differences.	20	15

3.	**Windows Programming**	Creating windows Application
		MessageBox class with all types of Show() method
		Basic Introduction to Form and properties
		Concept of adding various Events with event parameters
		Different Windows Controls
		  - Button
		  - Label
		  - TextBox
		  - RadioButton
		  - CheckBox
		  - ComboBox
		  - ListBox
		  - PictureBox
		  - ScrollBar
		  - TreeView
		  - Menu (MenuStrip, ContextMenuStrip)
		  - ToopStrip
		  - Timer
			20	15

		- Panel and GroupBox Dialog Boxes (ColorDialog, FontDialog, SaveFileDialog and OpenFileDialog) MDI Concept with MDI Notepad Concept of Inheriting Form		

4	**Database Programming with ADO.NET**	Concept of Connected and Disconnected Architecture
		Data Providers in ADO.NET
		Connection Object
		Connected Architecture
		  - Command
		  - DataReader
		Disconnected Architecture
		  - DataAdapter
		  - DataSet
		  - DataTable
		  - DataRow
		  - DataColumn
		  - DataRelation
		  - DataView
		Data Binding
		GridView Programming
			20	11

5	**User Controls (Components), Crystal Reports, Setup Project**	Creating User Control with
		  - Property
		  - Method
		  - Event
		Using User Control in Windows Projects as component,
		Creating Crystal Reports
		Types of Reports
		Report Sections
		Formula, Special Fiend and Summary in Report
		Types of Setup Projects
		Creating Setup Project
		  - File System Editor
		  - User Interface Editor
		  - Launch Conditions Editor
			20	8

		Total	**100**	**60**

Students seminar   - 5 Lectures
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures

TOTAL LECTURES 60+15=75

REFERENCE BOOKS

1. Pro C# 5.0 and .NET 4.5 Framework **(By: Andrew Troelsen)**
2. Head First C# - **(By: Jennifer Greene, Andrew Stellman)**
3. C# 5.0 Unleashed - **(By: Bart De Smet)**
4. Adaptive Code Via C# **(By: Gary McLean Hall)**
5. C#.NET Programming Black Book - steven holzner –dreamtech publications
6. Introduction to .NET framework - Wrox publication
7. Microsoft ADO. Net - Rebecca M. Riordan, Microsoft Press

CS – 21 NETWORK TECHNOLOGY AND ADMINISTRATION				
No	Topics	Details	Marks weight In %	Min Lec.
1	**Basics of Network, Network Models and LAN Sharing**	• Network concepts - What is network - Use of network • Network model -peer – to – peer -client – server • Network Services - File service, - Print service, - Comm. service, - Data base service, - Security service, - Application service • Network Access Methods - csma / cd, csma / ca, - Token passing - Polling • Network Topologies - Bus, Ring, Star, Mesh,Tree,Hybrid • Advanced☐☐Network Topologies Ethernet,CDDI,FDDI • Communication Methods - Unicasting - Multicasting - Broadcasting • OSI reference model with 7 layers • TCP/IP network model with 4 layers • File And Print Sharing in LAN. • aping of network drive • Disk quota • Encryption • Compression • Net meeting	20	12

| 2 | Transmission Media, Multiplexing & Switching Concepts, IP ADDRESSING | • Transmission Media
  - Types of Transmission media
  - Guided media
  - Co – Axial Cable,
  - Twisted Pair Cable,
  - Crimping of Twisted pair cable
  - Fiber Optic Cable
• Unguided media
  - Infrared, Laser, Radio, Microwave, Bluetooth tech.
• Different Frequency Ranges
• Multiplexing & Demultiplexing
• Multiplexing Types
  - FDM,
  - TDM,
  - CDM,
  - WDM
• Switching Tech.
  - Circuit Switching,
  - Message Switching,
  - Packet Switching
• What is ip address?
• Types of ip address
• ipv4
  - Class structure
  - subneting,supernetting
• ipv6
  - Basic structure of ipv6
  - Implementation of ipv6
  Migration from ipv4 to ipv6 | 20 | 12 |

| 3 | Network devices, Network Protocols | • CABLE NETWORK DEVICES
• LAYER1 DEVICES
 - LAN CARD,
 - MODEM ,
 - DSL & ADSL
 - HUB(Active,Passive,Smart hub)
 - REPEATER
• LAYER2 DEVICES
 - SWITCH(Manageable, nonmanagable)
 - BRIDGE(Source route, Transactional)
• LAYER3 DEVICES
 - ROUTER
 - LAYER3 SWITCH
 - BROUTER
 - GATEWAY
 - Network Printer
• WIRELESS NETWORK DEVICES
 Wireless switch
 Wireless router, ACCESSPOINT
• Packets &Protocols
• □Conn. Oriented protocols -TCP& connection less protocols-UDP
• TCP/IP STACK
 - HTTP
 - FTP
 - SMTP
 - POP3
 - SNMP
 - TELNET
 - ARP
 - RARP
• IPX/SPX
• AppleTalk,
• NetBIOS Name PROTOCOL
• L2CAP, RFCOMM Protocol | 20 | 12 |

| 4 | **Network Routing , Windows 2008 server** | • What is routing
• Requirements of routing
• Types of Routing
  - static
  - dynamic
  - default
• Routing protocols
  - Exterior Routing protocol
    1)BGP
  - Interior Routing protocol
    (1)Distance vector routing
      - RIP
      - IGRP
      - EIGRP
    (2)Link state routing
      - OSPF
      - IS IS
• Installation of 2008 enterprise server
• Various editions of windows 2008 server
• Installation & Configuration of Active Directory
  - Domains, Trees, Forests concept
• Accounts(User, Group,Computer)
• Policy (Security and audit)
• Logging Events
• MMC(Microsoft Management console) | 20 | 12 |

| 5 | **Basics of Network Security, Internet connection & Sharing** | • Fundamental of□Network Security
• Requirements of network Security
• Policies, Standard, Procedures, Baselines,Guidelines
• Security methods
  - Encryption
  - Cryptography
  - Authentication
• Security Principle –CIA Model
• Basics of Internat
• How internat is connect with computer
• Technology related internat
  - Dial up tech.
  - ISDN network tech.
  - Lease line tech.
• VPN
  - Types of VPN
  - Use of VPN
  - VPN protocols(PPTP, L2TP, IPsec.)
• Proxy server, Firewall
• GPS,GPRS
• CCTV tech. | 20 | 12 |
| | | **Total** | **100** | **60** |

Students seminar   - 5 Lectures
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures
TOTAL LECTURES 60+15=75

Reference Books:
1. Networking Essential - Glenn Berg Tech. Media
2. MCSE Self-Paced Training Kit (Server 2003)

3. Data Communication and Networking - B A Forouzan

No	Topics	Details	Marks weight In %	App. Lect
**CS – 22 : Operating Systems Concepts With Unix / Linux**				

No	Topics	Details	Marks weight In %	App. Lect

1	Introduction, Process Management, Memory Management	• Meaning of OS
		• Functions of OS
		• Features of OS
		• OS Types (User Point of View)
		• OS Types (Features Point of View)
		• Introduction of OS process
		• Process State Transition Diagram
		• Process Scheduling
		  o FCFS
		  o SJN
		  o Round Robin
		  o Priority Base Non Preemptive
		  o Priority Base Preemptive
		• Physical Memory and Virtual Memory
		• Memory Allocation
		• Contiguous Memory Allocation
		• Noncontiguous Memory Allocation
		• Virtual Memory Using Paging
		• Virtual Memory Using Segmentation
			20	12

| 2 | Getting Started with Unix, Unix Shell Command, Text Editing With vi Editor | • Unix Architecture
 • Unix Features
 • Types Of Shell (C, Bourn, Korn)
 • Unix File System
 • Types Of Files
     o Ordinary Files, Directory Files, Device Files
 • 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
     o <, >, <<, >>, \|
 • Advance Tools
 • Finding Patterns in Files
    grep,fgrep,egrep
 • Working with columns and fields
 • 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 a File System
    mount command
 • Concept of DeMounting a File System
    umount command
 • Introduction of vi editor
 • Modes in vi and Switching mode in vi
 • Cursor movement and
 • Screen control commands
 • Entering text, cut, copy, paste in vi editor | 20 | 18 |

| 3 | Shell Programming Getting Started with Linux, Linux Booting | • 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
  o if then fi
  o if then else fi
  o if then elif else fi
  o case esac
• test command
• Logical Operators
• Looping statements
  o for loop
  o while loop
  o until loop
  o break, continue command
• Arithmetic in Shell script
• Various shell script examples
• History of Linux
• GNU, GPL Concept
• Open Source & Freeware
• Structure and Features of Linux
• Installation and Configuration of Linux
  - Using with Ubuntu
• Startup, Shutdown and boot loaders of Linux
• Linux Booting Process
  - LILO Configuration
  - GRUB Configuration
• User Interfaces (GUI and CUI) | 20 | 15 |
| 4 | Working with X-Windows (Ubuntu) | • Layred Structure of X
  - Window Manager
  - Desktop Environment
  - Start Menu
  - User Configuration | 20 | 8 |

		- startx Command • Window Managers - GNOME, KDE, Purpose of window manager • The KDE Desktop - KDE Panel, Desktop Icons, Managing Windows - The KDE Control Panel • The GNOME Desktop - The GNOME Panel - Desktop Icons, Managing Windows - The GNOME Control Panel • Configuring X - /etc/X11/Xorg.conf file - Tuning Xorg.conf - Choosing a Window Manager • Create, Delete, Rename, Copy files and folders • Install / Uninstall Software		
5	Linux Admin (Ubuntu)	• Creating Linux User Account and Password • 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	20	7
		Total	**100**	**60**

Students seminar   - 5 Lectures.
Expert Talk   - 5 Lectures
Students Test   - 5 Lectures.
TOTAL LECTURES 60+15=75

Reference Books

1. Stalling W, "Operating Systems", 7th edition, Prentice Hall India.
2. Silberschatz, A., Peter B. Galvin and Greg Gagne, "Operating System Principles", Wiley-Indian Edition, 8th Edition
3. Unix Shell Programming - Y. Kanetkar- BPB Publications
4. Unix concepts and applications- Sumitabha Das

Hands-On (Not to be asked in the examination)

♦ Installation of Unix / Linux
♦ User and Group Creation
♦ Demo of Various Applications available in Unix / Linux like Star Office, Games and other productivity tools.
♦ Demo of GNOME, KDE Desktops in Linux.

CS - 23 : Practical based on CS – 19 & CS – 22		
Sessions	Topics	Marks
I	◆ CS – 19	50
II	◆ CS – 22	50

Note : Each session is of 3 hours for the purpose of practical examination.

CS - 24 : Practical Based on CS –20		
Sessions	Topics	Marks
I	◆ CS – 20	100

Note : Each session is of 3 hours for the purpose of practical examination.