BCA VI Semester
(w.e.f 2014-15 onwards)

Subject Code	Subject Title	Teaching Scheme Hrs/week		Examination			
				Exam. Duration (Hrs)	Marks		
		Theory	Practical		Theory/ Practical	IA	Total
14BCASPTT61	Software Practices and Testing	4	--	3	80	20	100
14BCABINT62	Business Intelligence	4	--	3	80	20	100
14BCAJ2ET63	J2EE	4	--	3	80	20	100
14BCAJ2EP64	Lab1: J2EE and Software Testing Laboratory (Based on 14BCASPTT61 and 14 BCAJ2ET63)	--	2 + 2	3	80	20	100
14BCAPROP65	Project and viva - voce	--	9	3	240	60	300

BCA – SIXTH SEMESTER

14BCASPTT61:SOFTWARE PRACTICES AND TESTING

Total Hours: 50 Hrs

UNITI:Principles of Testing, Software Development Life Cycle Models (SDLC), Phases of Software Project, Quality, Quality Assurance and Quality Control, Testing, Verification and Validation, Life Cycle Models, **White Box Testing:** White Box Testing, Static Testing, Structural Testing, Challenges in White Box Testing. **10 Hrs**

UNITII: Testing Techniques: Black Box Testing, Integration Testing**,** Top-Down Integration, Bottom-Up Integration, Bi-Directional Integration, Defect Bash, System and Acceptance Testing, Functional versus Non-functional Testing, Functional System Testing, Non-Functional System Testing, Acceptance Testing. **10 Hrs**

UNIT III: Performance Testing: Factors, Methodology, Tools, Process for performance testing, Regression Testing**,** Types, Testing of Object-oriented Systems, Usability and AccessibilityTesting, approach, Quality factors**,** Aesthetics Testing, Accessibility Testing, Tools for Usability.

10 Hrs

UNIT IV: Common People Issues: Perceptions and Misconceptions About Testing, comparison between Testing and Development Functions, Providing Career Paths for Testing Professionals, The role of the Ecosystem and a call for Action. **Organization Structures for testing teams:** Dimensions of Organization Structures, Structures in Single product Companies, Structures for Multi-Product Companies. (14.1 to 14.3). **10 Hrs**

UNIT V: Test Planning, Management: Test Planning: Preparation, scope management, Test approach, setting up criteria, Identifying responsibilities, test deliveries, testing tasks, activity breakdown, communication and risk management. **Test Management**: Choice of standards, Test Infrastructure Management, Integrating with Product release. (15.1 to 15.3) **Software Test Automation**: Introduction, Terms used, Skills needed, scope of automation: Identifying the types of testing amenable to automation.(16.1 to 16.4.1) **10 Hrs**

TEXT BOOKS

- SrinivasanDesikan, Gopalaswamy Ramesh: Software testing Principles and Practices, 2nd Edition, Pearson, 2012.

REFERENCE BOOKS:

- Software Testing :AdityaMathur.
- Software Testing, Ron Patton, Second Edition, SAMS Pearson Publication2011
- The Craft of Software Testing, Brain Marick, Pearson Publication 2010

14BCABINT62: BUSINESS INTELLIGENCE

Total Hours: 50 Hrs

Unit I: Business View of Information Technology applications: Business Enterprise Organization , Its functions, and core business process, baldrige business excellence frame work (Optional reading) Key purpose of using IT in business, The connected world : Characteristics of Internet _Ready IT Applications, Enterprise applications(ERP/CRM) and bespoke IT applications, information users and their requirements, Types of digital data , structured data , unstructured data, Semi-structured data , Difference between semi structured and structured data.

10 Hrs

Unit II: Introduction to OLTP and OLAP : OLTP(online transaction processing) OLAP(online Analytical Processing) Different OLAP Architectures , OLTP and OLAP, Data models for OLTP and OLAP, Role of OLAP tools in the BI Architecture , should OLAP be performed directly on operational data bases. **Business intelligence:** Using analytical information of decision support, Information sources before dawn of BI , BI defined , evolution of BI and role of DSS , EIS, MIS and digital dash boards, Need for BI at virtually all levels , BI for past , present and future, The BI value Chain , Introduction to Business analytics.

10 Hrs

Unit III:BI definitions and concepts : BI component Framework , BI Users, Business Intelligence Applications, BI roles and responsibilities, Basics of data integration , Need for data Warehouse ,Definition of data Warehouse, ODS, Ralph Kimball's Approach vsInmon's Approach , Goals of data warehouse, Constituents of data Warehouse , Data integration, Data integration technologies , Data Quality , Data Profiling, A case Study from the Healthcare Domain.

Unit IV:Types of Data Model: Data Modelling techniques, Fact table, Dimension table, Typical dimensional Models, Dimensional Modelling Life cycle, Understanding Measures and performance measurement System terminology , navigating a Business Enterprise.

10 Hrs

Unit V:Basics of Enterprise Reporting: Reporting perspectives common to all levels of Enterprise, Report Standardization and Presentation practices, Enterprise Reporting characteristics in OLAP World , Balanced score card , Dash boards.

10 Hrs

Text Books:

1. R.N.Prasad, SeemaAcharya , Fundamentals of Business analytics, First Edition , 2011, Wiley-India

Reference Books:

1. GaliShmueli,.Nitin R Patel , peter C . Bruce, " Data mining for Business Intelligence" Wiley-India, 2011.
2. Ralph Kimball ,Margy Ross, "Practical tools for Data Warehosuing and Business Intelligence" , second Edition Wiley-India 2011.

14BCAJ2ET63 : J2EE

Total: 50 Hours

Unit I: Swings : The origins of Swing; Two key features; MVC Connection; Components and Containers, The Swing Packages; A simple Swing application; Create a Swing Applet; Jlabel and ImageIcon; JTextField; The Swing Buttons; JTabbedpane; JScrollPane; JList; JComboBox; JTable, DesktopPane and JInternalFrames.

8 Hrs

Unit II: Java 2 Enterprise Edition Overview, Database Access The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions

10 hrs

Unit III: Servlets, JSP : Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Javax. servlet Package; Reading Servlet Parameter; The Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking. **Java Server Pages (JSP):** JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects.

12 Hrs

Unit IV: **Networking and RMI:** Networking Basics, Classes and Interfaces, Inet Address, TCP/IP Client Sockets, Server Sockets, URL , URL Connection, HttpURLConnection, The URL Class, Cookies, Datagrams, Java Remote Method Invocation: Remote Method Invocation concept; Server side, Client side

10 Hrs

Unit V: Enterprise Java Beans : Enterprise java Beans; Deployment Descriptors; Session Java Bean, Entity Java Bean; Message-Driven Bean; The JAR File.

10 hrs

Text Books :

1. Schildt, H., Java The Complete Reference, 7ed., Tata McGraw Hill, 2007.
2. Jim Keogh, J2EE The Complete Reference, Tata McGraw Hill, 2007.

Reference Books:

1. Liang, Y.D., Introduction to JAVA Programming, 6ed., Pearson Education,2007.
2. Stephanie Bodoff et al, The J2EE Tutorial, 2ed., Pearson Education, 2004.

J2EE and Software Testing Laboratory

(Based on 14BCASPTT61 and 14 BCAJ2ET63)

J2EE Lab Assignments ---

1. Write a JAVA Swing Program to create a MDI form and child forms.
2. Write a JAVA Program to insert data into Student DATA BASE and retrieve info base on particular queries
3. Write a JAVA Servlet Program to implement a dynamic HTML using Servlet (user name and password should be accepted using HTML and displayed using a Servlet).
4. Write a JAVA Servlet Program to Download a file and display it on the screen (A link has to be provided in HTML, when the link is clicked corresponding file has to be displayed on Screen)
5. Write a JAVA Servlet Program to implement and demonstrate get() and Post methods(Using HTTP Servlet Class).
6. Write a JAVA Servlet Program to implement sendRedirect() method(using HTTP Servlet Class)
7. Write a JAVA Program to establish the client & server communication using TCP/IP socket.
8. Write a JAVA JSP Program to print 10 even and 10 odd number.

Software Testing Lab Assignments --

1. Write a program(C/C++/Java) to test the following constructs.
    a. do...while
    b. if...else
    c. for loop

2. Black Box testing: (Functional Testing) Design a login web page and test the same.

3. Black Box testing: (Functional Testing and performance Testing with database)
   Design a Web page to update the student record into the database and test the same.

4. Black Box testing: (Functional Testing and performance Testing)
   Design a web page to provide the total number of objects present / available on the page and test the same.

5. Black Box testing: (Load Testing)
   Design a web page to get the count of visitors who visit your web page.

6. White Box Testing: Code Coverage- JaCoCo
   Write a Java program to compute the factorial of a given non-negative number using:

    a. Iterative Process
    b. Recursion

   Produce the Coverage Information using the JaCoCo tool

Guidelines for Software Testing Lab Assignments --

Introduction to Selenium IDE: (http://docs.seleniumhq.org/docs/02_selenium_ide.jsp)

The Selenium-IDE (Integrated Development Environment) is the tool you use to develop your Selenium test cases. It's an easy-to-use Firefox plug-in and is generally the most efficient way to develop test cases. It also contains a context menu that allows you to first select a UI element from the browser's currently displayed page and then select from a list of Selenium commands with parameters pre-defined according to the context of the selected UI element. This is not only a time-saver, but also an excellent way of learning Selenium script syntax.

Selenium Server (formerly the Selenium RC Server)

The Selenium Server is needed in order to run either Selenium RC style scripts or Remote Selenium Webdriver ones. The 2.x server is a drop-in replacement for the old Selenium RC server and is designed to be backwards compatible with your existing infrastructure.

Configuration Needed:

- JDK 1.6 or above
- Selenium IDE (http://docs.seleniumhq.org/docs/02_selenium_ide.jsp)
- Eclipse for Java or Netbeans
- Selenium RC Server (http://docs.seleniumhq.org/download/)
  (Down load Selenium Client drivers of java, we will get Selenium Server v2.1xxx.zip file)
- firebug (http://getfirebug.com)
- Apache Tomcat 6 (http://apache.org)

Reference Books:

1) Software Testing: A Craft Marts Approach, 3rd Edition by Paul Jorgensen.
2) Testing Computer Software, 2nd Edition by Jack Falk and Hury.

EVALUATION CRITERIA-PRACTICAL EXAMINATION:

Evaluation criteria for practical examinations shall be as follows:

1. Writing of Programs -30 Marks
   a. One program from the journal list – **15 Marks**
   b. Another program given by examiner based on the concepts studied -**15 Marks**
2. Execution of programs **- 35 Marks**
   a. Journal Program -20 Marks
   b. Program of Examiner's Choice -15 Marks
3. Viva-Voce **-10 Marks**
4. Journal / Laboratory Report **- 5 Marks**

Total **- 80Marks**

14 BCAPROP65: PROJECT

Total: 300 Marks

Project guidelines:

1. The project shall be carried out in a team of minimum of 2 members or maximum of three students.
2. The team has to give three seminars on their project work focusing on the following aspect:
    a. Synopsis / Problem Definition
    b. System Requirement Specifications (SRS)
    c. Design – High Level ,Low Level
3. Students shall submit the weekly progress report to their allotted internal guides.

Evaluation

A. Internal Assessment:

The project shall be evaluated for

a) Synopsis : 5 Marks
b) SRS Document as per IEEE format:5 marks
c) Design :20 marks
    (i) High Level Design
    (ii) Low Level Design
d) Coding and Testing :20 marks
e) Report :10 marks

B. Final Examination:

The final examination shall be evaluated on the following guidelines.

Project Report : 30 Marks
Presentation : 30 Marks
Demonstration : 90 Marks
Viva-Voce : 30 Marks
Modifications : 60 Marks

The following suggested guidelines must be followed in preparing the Final project Report:

Good quality white executive bond paper A4 size should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies.

Page Specification :(Written paper and source code)

- Left margin - 3.0 cms
- Right margin- 2.0 cms
- Top margin 2.54 cms
- Bottom margin 2.54 cms
- Page numbers - All text pages as well as Program source code listing should be numbered
- at the bottom center of the pages.

Normal Body Text: Font Size: 12, Times New Roman, Double Spacing, Justified. 6 point above and below para spacing

Paragraph Heading Font Size: 14, Times New Roman, Underlined, Left Aligned. 12 point above & below spacing

Chapter Heading Font Size: 20, Times New Roman, Centre Aligned, 30 point above and below spacing.

Coding Font size :10, Courier New, Normal

Submission of Project Report to the University : The student will submit his/her project report in the prescribed format. The Project Report should include:

1. One copy of the synopsis.
2. One hard Copy of the Project Report.
3. Soft copy of project on CD in a thick envelope pasted inside of the back cover of the project report.
4. The Project Report may be about 75 pages (excluding coding).

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION OF THE PROJECT

- Cover Page as per format
- Acknowledgement
- Certificate of the project guide/Centre Manager as at Annexure III
- Certificate of the Company/Organization (for direct candidates)
- Synopsis of the Project
- Main Report
    - Objective & Scope of the Project
    - theoretical Background Definition of Problem
    - System Analysis & Design
    - User Requirements System Planning (PERT Chart)
    - Methodology adopted
    - System Implementation & Details ofHardware& Software used.
    - System Maintenance & Evaluation
    - Cost and benefit Analysis
    - Detailed Life Cycle of the Project
        - ✓ ERD, DFD
        - ✓ Input and output screen design
        - ✓ Process involved
        - ✓ Methodology used for testing
        - ✓ Test Report, Printout of the Reports & print out of the Code Sheet
- User/Operational Manual - including security aspects, access rights, back up, controls, etc.

Annexure:

1. Brief background of the organization where the student has developed the project.
2. Data Dictionary (This should give a catalogue of the data elements used in the system / sub system developed. The following are the details required. Write NA if NOT applicable:
   Data Name,
   Aliases, if any
   Length (Size) Type,
   Numeric, Alpha, Binary etc.
3. List of abbreviations, Figures, Tables
4. References
   Bibliography
   Website
5. Soft copy of the project on CD/DVD.

EVALUATION CRITERIA-THEORY EXAMINATION:

The question paper shall consist of three parts

PART A:

Q 1 with TWELVE sub Questions numbered as a,b,c,d,e,f,g,h,i,j,k,l each of TWO marks should be set. Student has to answer any TEN questions. Note: There should not be any multiple choice questions. At least TWO questions should be set on each unit.

Total Marks: 2 X 10 =20 marks

PART B : SIX Questions numbered as 2, 3,4,5,6,7 each of FIVE marks should be set. Student has to answer any FOUR questions. Note: Of this at least three shall be problem oriented marks .At least ONE question should set on each unit.

Total marks: 5 X 4 =20 marks

PART C: FIVE Questions numbered as 8, 9,10,11,12, each of TEN marks should be set. Student has to answer any FOUR questions. At least ONE question should set on each unit.

Total marks: 10 X 4 =40 marks

TOTAL MARKS (SECTION A+B+C)20+20+40=80 Marks