BBA (CA) Semester 5 Syllabus Framework

Course Type	Course Code	Course / Paper Title	Teaching Scheme Hours / Week			Credit
			Theory	**Tutorial**	**Practical**	
DEC-1	19BaBbcU501	Java programming	4 lect / week	--	--	3
DEC-2	19BaBbcU502	Web technology	4	--	--	3
DEC-3	19BaBbcU503	Information System security	4	--	--	3
DEC-4	19BaBbcU504	Software Project Management	4	--	--	3
SEC-1	19BaBbcU505	Practical: Java programming	--	--	2 Lect Hrs / week	2
SEC-1	19BaBbcU506	Practical: Web technology	--	--	2 Lect Hrs / week	2
DEC-5	19BaBbcU507	Project	--	--	2 Lect Hrs / week	2
DEC-6	19BaBbcU508	Certificate Course: **MOOC**: Artificial Intelligence	online	--	--	3
		Total credit				**21**

CCT: Core Courses Theory
SEC: Skill Enhancement Courses
DEC: Discipline Elective Courses
AECC: Ability Enhancement Compulsory Courses
MOOC: Massive Open Online Courses

BBA (CA) Semester 6 Syllabus Framework

Course Type	Course Code	Course / Paper Title	Teaching Scheme Hours / Week			Credit
			Theory	**Tutorial**	**Practical**	
DEC-1	19BaBbcU601	Advanced Java	4 lect / week	--	--	3
DEC-2	19BaBbcU602	Recent trends in IT	4	--	--	3
DEC-3	19BaBbcU603	Mobile Application Development (Android)	4	--	--	3
DEC-4	19BaBbcU604	Software testing	4	--	--	3
SEC-1	19BaBbcU605	Practical: Advanced Java	--	--	2 Lect Hrs / week	2
SEC-1	19BaBbcU606	Practical: Android	--	--	2 Lect Hrs / week	2
DEC-5	19BaBbcU607	Project	--	--	2 Lect Hrs / week	2
DEC-6	19BaBbcU608	Certificate Course: **MOOC:** Cloud computing	online	--	--	3
		Total credit				**21**

CCT: Core Courses Theory
SEC: Skill Enhancement Courses
DEC: Discipline Elective Courses
AECC: Ability Enhancement Compulsory Courses
MOOC: Massive Open Online Courses

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: V**
Subject Code: 19BaBbcU501
Subject Name: Java programming

Course Objectives:

- This course provides an introduction to object-oriented programming (OOP) using the Java programming language.
- To learn why Java is useful for the design of desktop and web applications.
- To identify Java language components and how they work together in applications.
- To learn how to design a graphical user interface (GUI) with Java Swing.
- To understand how to use Java APIs for program development.
- To learn Java generics and how to use the Java Collections API.

Course Outcome:

- To develop general purpose applications.
- To develop Enterprise Applications

Chapter 1	**Introduction to Java**	Lectures
	1.1 Features of java 1.2 JDK Environment & tools like (java, javac, appletviewer, javadoc, jdb) 1.3 OOPs Concepts Class, Abstraction, Encapsulation, Inheritance, Polymorphism 1.4 Difference between C++ and JAVA 1.5 Structure of java program 1.6 Data types, Variables, Operators, Keywords, Naming Convention 1.7 Decision Making (if, switch), Looping (for, while) 1.8 Type Casting 1.9 Array Creating an array Types of Array - One Dimensional arrays - Two-Dimensional array 1.10 String - Arrays, Methods. - StringBuffer class	06
Chapter 2	**Classes and Objects**	Lectures
	2.1 Creating Classes and objects 2.2 Memory allocation for objects 2.3 Constructor 2.4 Implementation of Inheritance Simple, Multilevel, 2.5 Interfaces 2.6 Abstract classes and methods 2.7 Implementation of Polymorphism 2.8 Method Overloading, Method Overriding 2.9 Nested and Inner classes. 2.10 Modifiers and Access Control	07

	2.11 Packages Packages Concept Creating user defined packages 2.12 Java Built in packages (java.lang->math java.util->Random, Date, Hashtable etc.) 2.13 Wrapper classes	
Chapter 3	**Collection**	Lectures
	3.1 Collection Framework. 3.1.1 Interfaces - Collection - List - Set - SortedSet - Enumeration - Iterator - ListIterator 3.1.2. Classes - LinkedList - ArrayList - Vector - HashSet - TreeSet - Hashtable 3.2 Working with maps 3.2.1 Map interface 3.2.2 Map classes - HashMap - TreeMap	09
Chapter 4	**Exception Handling**	Lectures
	4.1 Exception types 4.2 Using try catch and multiple catch Nested try, throw, throws and finally 4.3 Creating user defined Exceptions	03
Chapter 5	**File Handling**	Lectures
	5.1 Stream ByteStream Classes CharacterStream Classes 5.2 File IO basics 5.3 File operations 5.4 Reading file (character, byte) 5.5 Writing file (character, byte)	05
Chapter 6	**Applet, AWT**	Lectures
	6.1 Introduction 6.2 Types applet 6.3 Applet Life cycle - Creating applet - Applet tag 6.4 Applet Classes - Color - Graphics - Font **AWT:**	07

	6.5 Components and container used in AWT 6.6 Layout managers 6.7 Listeners and Adapter classes 6.8 Event Delegation model	
Chapter 7	**Swing Programming**	Lectures
	7.1MVC (Model View Controller) Architecture 7.2 Concepts of Swing, Swing Packages 7.3 Introduction to Swing Component and Container Classes 7.4 Event handling 7.5 Swing components: JFrame, JPanel, JButton, JcheckBox, JtextField, JRadioButton, JLabel, JList, JDialog, JFileChooser, JColorChooser,JMenu 7.6 Working with Swing- An Example; Swing Components.	10
	Guidance / Discussions on specific experiential learning through field work	01
	Total:	**48**

Recommended Books:

- Programming with JAVA by E. Balgurusamy
- The Complete Reference – JAVA by Herbert Schildt
- Core java Volume 1 -Fundamentals - Cay S. Horstmann
- Java : A Beginner's Guide - Herbert Schildt
- Head First Java - Karthy Sierra & Bert Bates

Web Links:

- https://www.tutorialspoint.com/java/index.htm
- https://www.javatpoint.com/java-tutorial
- https://www.w3schools.com/java/

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: V**
Subject Code: 19BaBbcU502
Subject Name: Web technology

Course Objectives:

- Start learning web development today to become a web developer tomorrow.
- To know & understand concepts of internet programming.
- To acquire knowledge and skills for creation of website considering both client and server-side programming.
- To understand how to develop web-based applications using PHP.

Course Outcome:

- This course covers basic programming and Object-oriented techniques used in PHP.
- Understands the fundamentals of PHP language and syntax, introduces them to web development with most used web development language.
- It will help them to develop applications with different technologies and database driven applications
- Develop skills in analyzing the usability of a web site.

- Develop basic programming skills using Java Script.

Chapter 1	**JAVA Script**	Lectures
	1.1 Introduction to Java Script 1.2 Identifier & operator, control structure, functions 1.3 Document Object Model (DOM), 1.4 DOM Objects (window, navigator, history, location) 1.5 Predefined functions, math & string functions 1.6 Array in Java scripts 1.7 Event handling in Java script	04
Chapter 2	**Introduction to PHP**	Lectures
	2.1 Introduction to PHP 2.2 What does PHP do? 2.3 Lexical structure 2.4 Language basics 2.4.1 Variable, constant, keywords, Data Types 2.4.2 Control Structures 2.4.3 Variables variable 2.4.4 Type casting, Type Juggling 2.4.5 $_GET, $_POST, $_REQUEST Variables	05
Chapter 3	**Function and String and Arrays in PHP**	Lectures
	3.1 Defining and calling a function 3.2 Default parameters 3.3 Variable parameters, Missing parameters 3.4 Variable function, Anonymous function	09

	3.5 Types of strings in PHP 3.6 Printing functions 3.7 Encoding and escaping 3.8 Comparing strings 3.9 Manipulating and searching strings 3.10 Indexed Vs Associative arrays 3.11 Identifying elements of an array 3.12 Storing data in arrays 3.13Multidimensional arrays 3.14 Extracting multiple values 3.15 Converting between arrays and variables 3.16 Traversing arrays 3.17 Sorting 3.18 Action on entire arrays	
Chapter 4	**Introduction to Object Oriented Programming in PHP**	Lectures
	4.1 Classes 4.2 Objects 4.3 Introspection 4.4 Serialization 4.5 Inheritance 4.6 Interfaces 4.7 Encapsulation	04
Chapter 5	**Web Techniques**	Lectures
	5.1 Web Variables 5.2 Server information 5.3 Self Processing forms 5.4 Setting response headers 5.5 Maintaining state (Cookies and Sessions)	06
Chapter 6	**Databases**	Lectures
	6.1 Using PHP to access a database 6.2 Mysql Database functions 6.3 Relational databases and SQL 6.4 PEAR DB basics 6.5 Advanced database techniques 6.6 Application development	07
Chapter 7	**XML**	Lectures
	7.1 What is XML? 7.2 XML document Structure 7.3 PHP and XML 4.4 XML parser 7.5 The document object model 7.6 The simple XML extension 7.7 Changing a value with simple XML	06
Chapter 8	**Ajax**	Lectures

	8.1 Understanding java scripts for AJAX 8.2 AJAX web application model 8.3 AJAX –PHP framework 8.4 Performing AJAX validation 8.5 Handling XML data using PHP and AJAX 8.6 Connecting database using PHP and AJAX	06
	Guidance / Discussions on specific experiential learning through field work	01
	Total:	**48**

Recommended Books:

- Complete HTML- Thomas Powell
- HTML and JavaScript – Ivan Bayross
- Programming PHP - Rasmus Lerdorf and Kevin Tatroe, O'Reilly publication
- Beginning PHP 5 - Wrox publication
- PHP for Beginners, SPD publication

Web Links:

- https://www.w3schools.com
- https://www.geeksforgeeks.org
- https://www.tutorialspoint.com/html/html_javascript.htm
- https://www.php.net
- https://phptherightway.com/

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: V**
Subject Code: 19BaBbcU503
Subject Name: Information System Security

Course Objectives:

- To understand the necessity of protecting information and systems that supports the operations and assets of agency.
- To understand and study cryptography and key encryption techniques used today.
- Comprehend relevant security parameters in the internet, web, database systems and applications.
- To understand what cyber-crime is and what are acts associated with it in order to avoid problems with data security.

Course Outcome:

- Understand the requirement of information security and a clear understanding of its importance.
- Be familiar with information security threats and countermeasures, and familiar with information security designs using available secure solutions.
- Use the database security mechanisms, intrusion detection systems, formal models of security, cryptography, network, web security.

Chapter 1	Introduction to Information Security	Lectures
	1.1 Various Principles of Security, 1.2 Attacks, Services and Mechanisms, 1.3 Integrity check, 1.4 Digital Signature, 1.5 Authentication.	04
Chapter 2	Cryptography	Lectures
	2.1 Briefing Private Key Cryptography: Block Encryption, DES Algorithm, AES Algorithm Problems with DES, Variations of DES, IDEA Algorithm. 2.2 Uses of Secret key Cryptography; ECB, CBC, OFB, CFB. 2.3 Public Key Encryption: RSA. 2.4 Symmetric and Asymmetric Key Cryptography together.	12
Chapter 3	Authentication and Internet Security	Lectures
	3.1 Types of Authentication- Password-based authentication, address-based authentication, cryptographic authentication, smart cards, biometrics, mutual authentications, reflection attacks, Message Digest: MD5, SHA, Digital Certificate process, Kerberos. 3.2 Transport Layer Security: SSL, SET Email Security: PGP, S/MIME IP security: IPSec	11
Chapter 4	Intrusion Prevention and Detection:	Lectures
	4.1 Introduction, Intrusion Detection Systems,	08

	Prevention versus Detection, Types of Intrusion Detection systems, DOS attacks, Flooding Attacks, DdoS Attack Prevention/Detection, Defenses Against Denial-of-Service Attacks, Malware Detection and Types, VPN.	
Chapter 5	An overview on Firewall	Lectures
	5.1 Characteristics, Packet filters, 5.2 Application-Level Gateways, Circuit Level Gateways, Firewall Architectures, Trusted System	06
Chapter 6	Cyber Security	Lectures
	6.1 **Cyber Crime –** Cyber Crime Introduction, Email Tracing and Tracking, Email Spoofing, Mobile Number Hacking, Data Recovery, Cyber Fraud Detection, Hack Website, Web Server/ISP, Web & DOS Attacks, Security Policy 6.2 **Cyber Law & IT Act -** Fundamentals of Cyber Law, Introduction to Indian Cyber Law: Information Technology Act 2000, Main features of the IT Act 2000, Information Technology Amendment Act 2008 and its major strengths.	06
	Guidance / Discussions on specific experiential learning through field work **Case study (one case study per cryptography method)**	01
	Total:	**48**

Recommended Books:

- Cryptography and Network Security- Atul Kahate
- Network Security and Cryptography- Bernard Menezes
- Kaufman C., Perlman R., and Speciner, “Network Security”, Private Communication in a public world, 2nd ed., Prentice Hall PTR.,2002
- Cyber Crime – Bansal S. K.
- Cyber Law – Ecommerce and M-Commerce- Ahmand Tabrez.
- Cyber Law in India-Farooq Ahmad (Pioneer Books).
- Godbole, “Information Systems Security”, Willey.00
- 1Merkov, Breithaupt, “Information Security”, Pearson Education
- Schou, Shoemaker, “Information Assurance for the Enterprise”, Tata McGraw Hill
- Sood, “Cyber Laws Simplified”, Mc Graw Hill
- Furnell, “Computer Insecurity”, Springer 7. IT Act 2000

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: V**
Subject Code: 19BaBbcU504
Subject Name: Software Project Management

Course Objective:

- To learn the process of software project management, cost estimation, use of project Management tools, configuration management, user roles and software teams.

Course Outcome:

- Able to recognize evolving role of software project management
- Apply project management concepts and techniques to an IT project.
- Identify issues that could lead to IT project success or failure.
- Explain project management in terms of the software development process.
- Describe the responsibilities of IT project managers.
- Evaluate the role of user and software teams

Chapter 1	Introduction to Software Project Management and Project Planning	Lectures
	1. **Introduction to Software Project Management:** 1.1. Introduction 1.1.1. Important of SPM. 1.1.2. What is a Project? 1.1.3. Software Projects versus Other Types of Project. 1.2. Management and Technical Project Management 1.3. Activities Covered by Software Contract Project Management 1.4. Plans, Methods and Methodologies 1.5. Categorizing Software Projects 1.6. Project Charter and Stakeholders 1.7. Setting Objectives 1.8. The Business Case, Project Success and Failure. 1.9. Management Introduction 1.9.1. Management Control 1.9.2. Project Management Life Cycle, 1.9.3. Traditional versus Modern Project Management Practices. 2. **Project Evaluation:** 2.1. Introduction, Business Case, Cost–benefit Evaluation Techniques, Risk Evaluation, Programme Management. 2.2. Managing the Allocation of Resources within Programme, Strategic Management. 3. **An Overview of Project Planning:** 3.1. Introduction to Step Wise Project Planning 3.1.1. Step 0: Select Project, Step 1: Identify Project Scope and Objectives, Step 2: Identify Project Infrastructure, Step 3: Analyze Project Characteristics, Step 4:	09

	Identify Project Products and Activities, Step 5: Estimate Effort for Each Activity, Step 6: Identify Activity Risks, Step 7: Allocate Resources, Step 8: Review/Publicize Plan, Steps 9 and 10: Execute Plan/Lower Levels of Planning, Work Breakdown Structure.	
Chapter 2	**Selection of an Appropriate Project Approach and Estimation**	
	1. **Selection of an Appropriate Project Approach and Estimation:** 1.1. Introduction, Build or Buy? Choosing Methodologies and Technologies, 1.2. Software Processes and Process Models, Choice of Process Models, Structure versus Speed of Delivery, The Waterfall Model, The Spiral Model, Software Prototyping, Incremental Delivery, Rapid Application Development, Agile Methods, Extreme Programming (XP), Scrum, Lean Software Development, Managing Iterative Processes, Selecting the Most Appropriate Process Model. 2. **Software Effort Estimation:** Introduction and Software Effort Estimation Techniques.	9
Chapter 3	**Activity Planning and Risk Management**	
	1. Activity Planning: 1.1. Introduction, Objectives of Activity Planning, When to Plan, Project Schedules, Projects and Activities, Sequencing and Scheduling Activities, Backward Pass. 1.2. Identifying the Critical Path, Activity Float, Shortening the Project Duration, Critical path chain, Identifying Critical Activities. **2. Risk Management:** 2.1. Introduction, Risk, Categories of Risk, Risk Management Approaches, A Framework for Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management. 2.2. Evaluating Risks to the Schedule, PERT Technique, Gantt Chart. **3. Resource Allocation:** 3.1. Introduction, Nature of Resources, Identifying Resource Requirements, Scheduling Resources. 3.2. Creating Critical Paths, Counting the Cost, Being Specific, Publishing the Resource Schedule, Cost Schedules, Scheduling Sequence.	10
Chapter 4	**Monitoring and Control**	
	1. **Monitoring and Control:** 1.1. Introduction, Creating the Framework, Collecting the Data, Review, Visualizing Progress, Cost	11

	Monitoring, Earned Value Analysis, Prioritizing Monitoring. 1.2. Getting the Project Back to Target, Change Control, Software Configuration Management (SCM). 2. **Managing Contracts:** 2.1. Introduction, Types of Contract, Stages in Contract Placement 2.2. Typical Terms of a Contract, Contract Management, Acceptance. 3. **Managing People in Software Environments:** 3.1. Introduction, Understanding Behavior, Organizational Behaviors. 3.2. Stress, Stress Management, Health and Safety, Some Ethical and Professional Concerns.	
Chapter 5	**Managing People in Software Environments and Software Quality**	
	1. **Working in Teams:** 1.1. Introduction, becoming a Team, Decision Making, Organization and Team Structures, Coordination Dependencies, Dispersed and Virtual Teams, Communication Genres, Communication Plans, Leadership. 2. **Software Quality:** 2.1. Introduction, The Place of Software Quality in Project Planning, Importance of Software Quality, Defining Software Quality, Software Quality Models, ISO-9126, Product and Process Metrics, Product versus Process Quality Management. 2.2. Quality Management Systems, Process Capability Models, Techniques to Help Enhance Software Quality, Testing, Software Reliability, Quality Plans. 3. **Project Closeout:** Introduction, Reasons for Project Closure, Project Closure Process, Performing a Financial Closure, Project Closeout Report.	8
	Guidance / Discussions on specific experiential learning through field work **Case study (one case study on Software Effort Estimation Techniques)**	1
	Total:	**48**

Recommended Books:

- Schwalbe, Kathy (2016) "Information Technology Project Management" Edition: 8th, ISBN-13: 978-1285452340, ISBN-10: 1285452348
- Bob Hughes and Mike Cotterell, "Software Project Management", Tata McGraw Hill, 4th edition, 2006
- Royce, "Software Project Management", Pearson Education, 2005
- Kieron Conway, "Software Project Management", Dreamtech Press, 2001
- S. A. Kelkar, "Software Project Management", PHI Publication, 15th edition, 2013.
- Roger S. Pressman, "Software Engineering -A Practitioner's approach", Tata McGraw Hill, 2009
- Ramesh, "Managing Global software Projects", Tata McGraw Hill, 2001
- Pankaj Jalote, "Software Project Management in Practice", Pearson Edn., 2002.
- Robert K. Wysocki, "Effective software project management", Willy India edition
- Software engineering principles and practice, McGraw-Hill, Waman S. Javadekar

Weblink :

- http://www.pmi.org
- https://www.geeksforgeeks.org/
- https://www.tutorialspoint.com/

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: VI**
Subject Code: 19BaBbcU601
Subject Name: Advanced Java

Course Objectives:

- Design and develop applications with RDBMS.
- Design and develop GUI applications with multithreading.
- Design and develop Web applications
- Designing network applications by encapsulating an application's business logic.

Course Outcome:

- learn to access database through Java programs, using Java Database Connectivity (JDBC)
- create dynamic web pages, using Servlets and JSP.
- create a program with multithreading support.
- make a reusable software component, using Java Bean.
- invoke the remote methods in an application using Remote Method Invocation (RMI)

Chapter 1	**JDBC**	**Lectures**
	1.1 The design of JDBC 1.2 Basic JDBC program Concept 1.3 Drivers 1.4 Architecture of JDBC 1.5 Making the Connection, Statement, ResultSet, PreparedStatement, CallableStatement 1.6 Executing SQL commands 1.7 Executing queries	10
Chapter 2	**Networking**	**Lectures**
	2.1 The java.net package 2.2 Connection oriented transmission – Stream Socket Class 2.3 Creating a Socket to a remote host on a port (creating TCP client and server) 2.4 Simple Socket Program Example.	09
Chapter 3	**Servlet and JSP**	**Lectures**
	Servlet 3.1 Introduction 3.2 How It differ from CGI 3.3 Types of servlet 3.4 Life cycle of servlet 3.5 Execution process of Servlet Application 3.6 Session Tracking 3.7 Cookie class 3.8 Servlet- JDBC **JSP** 3.9 Introduction to JSP 3.10 Components of JSP Directives, Tags, Scripting Elements	10

	3.11 Execution process of JSP Application 3.12 Building a simple application using JSP 3.13 JSP with Database	
Chapter 4	**Multithreading**	**Lectures**
	4.1 Introduction to Thread 4.2 Life cycle of thread 4.3 Thread Creation - By using Thread Class - By Using Runnable interface 4.4 Priorities and Synchronization 4.5 Inter thread communication 4.6 Implementation of Thread with Applet	09
Chapter 5	**Java Beans and RMI**	**Lectures**
	Java Beans 5.1 What is bean 5.2 Advantages 5.3 Using Bean Development Kit (BDK) 5.4 Introduction to jar and manifest files 5.5 The javabeans API **RMI: Remote Method Invocation** 5.6 Introduction to remote object RMI architecture 5.7 Stubs and skeleton 5.8 Registry 5.9 Setting up RMI 5.10 Using RMI with applet	09
	Guidance / Discussions on specific experiential learning through field work	1
	Total:	**48**

Recommended Books:

- The Complete Reference – JAVA by Herbert Schildt
- Core java –II by Cay S. Horstmann and Gary Cornell
- Complete Reference J2EE by Jim Keogh

Web Links:

- https://www.tutorialspoint.com/java/index.htm
- https://www.javatpoint.com/java-tutorial
- https://www.w3schools.com/java/

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: VI**
Subject Code: 19BaBbcU602
Subject Name: Recent Trends in IT

Course Objective:

- To identify the different technologies.
- To understand the importance of IT enabled services and challenges for the same.
- To learn different applications indifferent technologies.
- To enable students to have skills that will help them to solve complex real-world problems for decision support.

Course Outcome:

- Describe the importance of IT enabled services and challenges.
- Identify strategic IT planning for software development.
- Recognize enterprise IT architecture for Information technology.
- Use their skills to find out various current IT trends in IT.

Chapter 1	Big Data	Lectures
	1.1 Introduction to Big Data 1.2 Types of Digital Data 1.3 Why it's Important, Risks of Big Data, Need of Big Data 1.4 Structure of Big Data, Exploring Big Data, 1.5 Filtering Big Data, the Need for Standard 1.6 Big Data Analytics 1.7 Application of Big data	08
Chapter 2	Internet of Things (IoT)	Lectures
	2.1 IOT concepts 2.2 Components of IOT System/ IoT architecture. 2.3 IOT ecosystem 2.4 IOT in Indian Scenario 2.5 Advantages, disadvantages of IOT 2.6 Challenges in IOT implementation. 2.7 Relevance of IOT for the future. 2.8 IOT Applications, IOT Case study	08
Chapter 3	Blockchain	Lectures
	3.1 Introduction and Definition of Blockchain 3.2 Blockchain Architecture 3.3 How Blockchain Transaction Works, Need of Blockchain 3.4 Blockchain versions, Variants 3.5 Bitcoin cryptocurrency 3.6 Blockchain vs. Shared Database 3.7 Advantages and Limitations of Blockchain 3.8 Important Real Life Use Cases of Blockchain	08
Chapter 4	Introduction to Fuzzy Logic	Lectures

	4.1 Concept of computing systems. 4.2 "Soft" computing versus "Hard" computing 4.3 Characteristics of Soft computing 4.4 Some applications of Soft computing techniques 4.5 Introduction to Fuzzy logic. 4.6 Fuzzy sets, crisp set and membership functions. 4.7 Operations on Fuzzy sets. fuzzy complements, fuzzy intersections, and fuzzy union 4.8 Definition of Fuzzification and Defuzzification, crisp sets 4.9 Some applications of Fuzzy logic.	08
Chapter 5	Machine Learning	Lectures
	5.1 An introduction with machine learning 5.2 Types of machine learning. 5.3 Learning process, Data set 5.4 Model Learning and Model testing 5.5 Types of machine learning problems 1) Supervised 2) Unsupervised 3) Reinforcement 5.6 Regression and classification 5.7 Stages for problem solving in machine learning 5.8 Applications and benefits of Machine learning 5.9 Real world case studies based on Machine Learning	08
Chapter 6	Search Engine Optimization (SEO)	Lectures
	6.1 Introduction to SEO 6.2 Types of SEO Techniques - Black Hat, White Hat, etc. 6.3 How it works CRAWLING, INDEXING and RANKING 6.4 Search Engine Optimization - 1) On Page 2) Off Page 6.5 Some SEO Tools	07
	Guidance / Discussions on specific experiential learning through field work	1
	Total:	**48**

Recommended Books:

- Machine Learning Pocket Reference: by Matt Harrison
- Fuzzy Logic with Engineering Application by Timothy J. Ross
- Blockchain Basics By Daniel Drescher
- Internet of Things: A Hands-On Approach by Arsheep Bahga, Vijay Madisetti
- Seema Acharya, Subhashini Chellappan, "Big Data Analytics" Wiley 2015.

course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: VI**
Subject Code: 19BaBbcU603
Subject Name: Mobile Application Development (Android)

Course objectives:

- To cover the fundamentals of Android programming using the Android SDK.
- Topics discussed in this course include: fundamental concepts in Android programming activities and intents, designing user interface using views, data persistence, developing android services.

Course Outcomes:

- Demonstrate their understanding of the fundamentals of Android operating systems
- Demonstrate their skills of using Android software development tools ·
- Demonstrate their ability to deploy software to mobile devices ·
- Demonstrate their ability to debug programs running on mobile devices

Chapter 1	**Introduction to Mobile Computing and Android**	Lectures
	1.1 Introduction to Mobile Programming, need of Mobile Apps. 1.2 Brief About Android 1.3 Architecture of Android- OS Layer, Linux Kernel and Libraries. 1.4 Android for mobile apps development 1.5 Introduction to Android Frameworks.	08
Chapter 2	**Designing the user interface**	Lectures
	2.1 Design criteria for Android Application: Hardware Design Consideration, Design Demands For Android application 2.2 Intent, Activity- Activity Lifecycle, Creating Activities 2.3 Manifest 2.4 Introducing layouts and its Properties 2.5 Introducing GUI Objects i.e. Push Button, Text / Labels, Edit Text, Toggle Buttons etc.	07
Chapter 3	**Advance User Interface**	Lectures
	3.1 Selection Components (Grid View, List View, Spinners) 3.2 Adapters 3.3 Creating and using Menus 3.4 Toast: defining class and methods (with example)	08
Chapter 4	**Talking with Servers (Web services)**	Lectures
	4.1 Introduction to web services 4.2 Soap Web Service 4.3 Parsing Techniques: Ex. XML	08
Chapter 5	**Data Storage**	Lectures
	5.1 File system in android 5.2 Internal and external storage 5.3 Saving and loading files	08

	5.4 File Management tools	
Chapter 6	**Database Connectivity**	Lectures
	6.1 Introduction to SQLite 6.2 Creating a Database 6.3 Database Connectivity 6.4 Working with SQL queries (Insert, Update, Delete)	08
	Guidance / Discussions on specific experiential learning through field work	1
	Total:	48

Recommended Books:

- Android Programming: The Big Nerd Ranch Guide- By Chris Stewart , Kristin Marsicano
- Headfirst Android Development: By Dawn Griffiths, David Griffiths.
- Android Programming for Beginners: By John Horton

Course Contents

Course Name: T.Y.B.B.A. (CA) **Semester: VI**
Subject Code: 19BaBbcU604
Subject Name: Software Testing

Course Objectives:

- To know the concept of software testing.
- To understand how to test bugs in software.
- To develop programming logic.

Course Outcome:

- learn concepts of testing, it's principles, life cycle
- know testing approaches.
- understand how to test bugs in software.
- know software testing approaches and metrics.

Chapter 1	**Software Testing**	Lectures
	1.1 Introduction, Nature of errors, 1.2 Testing principles 1.3 Goals of testing 1.4 Software Testing life cycle 1.5 Functional vs Nonfunctional testing 1.6 Static vs Dynamic testing 1.7 Debugging-approaches ○ Brute-force ○ Backtracking ○ Induction ○ Deduction 1.8 Quality Assurance- tools (QTP,Selenium etc)	08
Chapter 2	**Approaches to Testing - I**	Lectures
	2.1 White Box Testing, Black Box Testing, Gray Box Testing, 2.2 Unit Testing 2.3 Integration- Top-down, Bottom up 2.4 Big Bang Sandwich	07
Chapter 3	**Testing for Specialized Environments**	Lectures
	3.1 Testing GUI's, Testing of Client/Server Architectures, 3.2 Testing Documentation and Help Facilities, 3.3 Testing for Real-Time Systems	09
Chapter 4	**Software Testing Strategies & Software metrics**	Lectures
	4.1 Validation Testing, System Testing, verification, 4.2 V-Model, W-Model, 4.3 Performance Testing, Regression Testing, Agile testing, 4.4 Acceptance testing, Smoke Testing, Load Testing, 4.5 Introduction, Basic Metrics, Complexity Metrics	12

Chapter 5	**Specialized Testing & Testing Tools (Introduction)**	Lectures
	5.1 Manual Testing vs Automation Testing 5.2 Test Case Design, Junit, Apache Jmeter, Winrunner 5.3 Loadrunner, Rational Robot	7
Chapter 6	**Testing Tools**	Lectures
	Case study: On Writing Test cases (Min 2) **Introduction to QTP**	4
	Guidance / Discussions on specific experiential learning through field work	1
	Total:	**48**

Recommended Books:

- Software Engineering – A Practitioner's Approach, Roger S. Pressman, Tata McGraw Hill
- Software Engineering for Students- A Programming Approach, Douglas Bell, Pearson Education
- "Foundations of Software Testing", by Aditya P. Mathur – Pearson Education custom edition 2000.
- "The ART of Software Testing", by Glenford J. Myers, Wiley India, Second Edition
- "Software Testing: Principles and Practices", by Srinivasan D and Gopalswamy R, Pearson Ed, 2006.