

# **University Grant Commission**

## **Bachelor of Vocational (B.Voc.)**

**ShikshanPrasarakSansthas**

**S. N. Arts, D. J. M. Commerce and B. N. S. Science College, Sangamner**

**Dist.Ahmednagar -422605**

### **Software Development (SD)**

- |                                  |  |
|----------------------------------|--|
| <b>1. Discipline</b>             | <b>:Science</b>                                      |
| <b>2. Name of the Course</b>     | <b>: Software Development (SD)</b>                   |
| <b>3. Co-ordinate Department</b> | <b>: Dept. Of Computer &amp; Electronic Sciences</b> |
| <b>4. Name Of Coordinator</b>    | <b>: Prof. R.S.Laddha</b>                            |

## B.Vocational(Software Development)

### Aim:

Student should be able to design, develop, operate and maintain the software .

### Objectives:

1. To develop web based applications in anyfield.
2. To make the student will be able to play important role in marketing of software.
3. To provide training about software to software users.

Programme	NameoftheSpecialization (*)	JobRolesproposedtobecoveredin each year(AlongwithNSQFlevel)		
		Yr-1	Yr-2	Yr-3
Information Technology	Software Development(SD)	Development of Language and Communication skill.	Conceptual and practical understanding.	Development of abilities/skill to tackle problems related networking.
		Development of Practical skills required to accomplish task and solved problems.	To design framework of software.	Development of professional Websites.
		Development of abilities to implements small programs.	Development of practical skill required to generate solution to specific problem related to hardware.	Development of basic skills in software design and maintenance
		Practical skill of presentation.	Development of independent software modules.	Able to find the problems in software.

# Syllabus Structure B.Vocational (Software Development)

Course Code	Section	First Year	Credits
		Sem-I	
SDT-11	SECTION-I	Soft Skill –English and CommunicationSkill-I	02
	SECTION-II	Computer Fundamentals-I	02
SDT-12	SECTION-I	HTML5 & CSS3–I	02
	SECTION-II	Applied Mathematics -I	02
SDT-13	SECTION-I	Introduction to C Programming-I	02
	SECTION-II	Database Management System-I	02
SDP-14		Practical I Soft skill Development	
		Lab work	02
		Field Work	02
		Self-Learning	02
SDP-15		Practical –II C Programming Computer Hardware ,OS & N/W	
		Lab Work C Programming	02
		Field work Computer Hardware ,OS & N/W	02
		Self-Learning (Seminar ,e-content ,Activity)	02
SDP-16		Practical –III Database management System ,HTML5&CSS3	
		Lab Work	02
		Field Work based on Project	02
		Mini Project	02
		<b>Sem-II</b>	
SDT-21	SECTION-I	Soft Skill –English and CommunicationSkill-II	02
	SECTION-II	Computer Fundamentals-II	02
SDT-22	SECTION-I	HTML5 & CSS3 –II	02
	SECTION-II	Applied Mathematics -II	02
SDT-23	SECTION-I	Introduction to C Programming-II	02
	SECTION-II	Database Management System-II	02
SDP-24		Practical I Soft skill Development	
		Lab work	02
		Field Visit/Field Work	02
		Self-Learning	02
SDP-25		Practical –II C Programming Computer Hardware ,OS & N/W	
		Lab Work C Programming	02
		Field work Computer Hardware ,OS & N/W	02
		Self-Learning (Seminar ,e-content ,Activity)	02
SDP-26		Practical –III Database management System ,HTML5&CSS3	
		Lab Work	02
		Field Work based on Project	02

		Mini Project	02
		<b>Second Year</b>	
		Sem-III	
<b>SDT-31</b>	<b>SECTION-I</b>	Operating System –I	02
	<b>SECTION-II</b>	Introduction to C#.NET –I	02
<b>SDT-32</b>	<b>SECTION-I</b>	Software Engineering-I	02
	<b>SECTION-II</b>	Object Oriented Programming using CPP-I	02
<b>SDT-33</b>	<b>SECTION-I</b>	Networking-I	02
	<b>SECTION-II</b>	PHP-I	02
<b>SDP-34</b>		Practical I Introduction to C#.NET	
		Lab work	02
		Field Work (Market Survey about Software)	02
		Self-Learning(PPT,E-Content & activity)	02
<b>SDP-35</b>		Practical –II CPP	
		Lab Work	02
		Activity	02
		Self-Learning (PPT,E-Content & activity)	02
<b>SDP-36</b>		Practical –III PHP	
		Lab Work	02
		Field Work (based on project)	02
		Project	02
		Sem-IV	
<b>SDT-41</b>	<b>SECTION-I</b>	Operating System –II	02
	<b>SECTION-II</b>	Introduction to C#.NET –II	02
<b>SDT-42</b>	<b>SECTION-I</b>	Software Engineering-II	02
	<b>SECTION-II</b>	Object Oriented Programming using CPP-II	02
<b>SDT-43</b>	<b>SECTION-I</b>	Networking –II	02
	<b>SECTION-II</b>	PHP-II	02
<b>SDP-44</b>		Practical I Introduction to C#.NET –II	
		Lab work	02
		Field Work/Field Visit	02
		Self-Learning	02
<b>SDP-45</b>		Practical –II CPP	
		Lab Work	02
		Activity	02
		Self-Learning	02
<b>SDP-46</b>		Practical –III PHP	
		Lab Work	02
		Field Work (Based on project)	02
		Project	02

		<b>Third Year</b>	
		Sem-V	
<b>SDT-51</b>	<b>SECTION-I</b>	ASP.net	02
	<b>SECTION-II</b>	OOSE	02
<b>SDT-52</b>	<b>SECTION-I</b>	Mobile Computing	02
	<b>SECTION-II</b>	Core Java	02
<b>SDT-53</b>	<b>SECTION-I</b>	RDBMS	02
	<b>SECTION-II</b>	Web Development using CMS-I	02
<b>SDP-54</b>		Practical I ASP .net	
		Lab work	02
		Field Work/Activity (related to website)	02
		Self-Learning	02
<b>SDP-55</b>		Practical –II Core Java	
		Lab Work	02
		Field Work/Field visit	02
		Self-Learning	02
<b>SDP-56</b>		Practical –III Web Development using CMS	
		Lab Work	02
		Field Work (Based on project)	02
		Project	02
		Sem-VI	
<b>SDT-61</b>	<b>SECTION-I</b>	Computer Graphics	02
	<b>SECTION-II</b>	Software Testing	02
<b>SDT-62</b>	<b>SECTION-I</b>	Mobile Programming using Android	02
	<b>SECTION-II</b>	Advanced Java	02
<b>SDT-63</b>	<b>SECTION-I</b>	Multimedia	02
	<b>SECTION-II</b>	Web Development using CMS-II	02
<b>SDP-64</b>		Practical I Mobile Programming using Android	
		Lab work	02
		Project(Android App)	02
		Self-Learning	02
<b>SDP-65</b>		Practical –II Advanced Java	
		Lab Work	02
		Field Work/Field visit	02
		Self-Learning	02
<b>SDP-66</b>		Practical –III Web Development using CMS	
		Lab Work	02
		Field Work (Based on project)	02
		Project	02

**Third Year**

**Objectives :**

To understand the DOTNET framework, C# language features and Web development using ASP.NET

**Syllabus**

<b>Asp.NET</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
1	<b>Introduction to ASP.NET</b>	1
2	<b>Server Controls and Variables, control Structures &amp; Functions</b> 1. Forms, webpages, HTML forms, Webforms 2. Request & Response in Non-ASP.NET pages 3. Using ASP.NET Server Controls 4. Datatypes : Numeric, text, arrays, datacollections 5. Overview of Control structures 6. Functions : web controls as parameters	6
2	<b>Even Driven Programming andPostBack</b> 1. HTML events 2. ASP.NET page events 3. ASP.NET Web control events 4. Event driven programming and postback	5
3	<b>Reading from Databases</b> 1. Data pages 2. ADO.NET	3
4	<b>ASP.NET Server Controls</b> 1. ASP.NET Web Controls 2. HTML Server Controls 3. Web Controls	6
5	<b>DOTNET assemblies and Custom Controls</b> 1 . Introduction to Coolies, Sessions 2. Session events 3. State management Recommendations	3
6	<b>Web Services</b> 1. HTTP, XML & Web services 2. SOAP 3. Building ASP.NET web service 4. Consuming a web service	6

**References:**

1. Beginning Visual C#, Wrox Publication
2. Professional Visual C#, Wrox Publication
3. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â© 2001, 403 pages
4. Beginning ASP.NET 3.5, Wrox Publication
5. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly
6. Illustrated C# 2008, Solis, Publication APRESS, ISBN 978-81-8128-958-2
7. Professional C# 4.0 and .NET 4by Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, WROX
8. Beginning C# Object-Oriented Programming By Dan Clark ,Apress
9. ADO.NET Examples and Best Practices for C# Programmers, By Peter D. Blackburn Apress
10. Database Programming with C#, By Carsten Thomsen, Apress

## 2)Object Oriented Software Engineering

Total lectures: 30 Credits: 02

Sem-V

### Syllabus

<b>Object Oriented Software Engineering</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
1	<b>Object Oriented Concepts and Principles</b> 1.1 What is Object Orientation - 1.1.1 Introduction – 1.1.2 Object – Classes and Instance 1.1.3 Polymorphism 1.1.4 Inheritance 1.2 Object Oriented System Development – 1.2.1 Introduction - 1.2.2 Function/Data Methods (With Visibility) - 1.2.3 Object Oriented Analysis - 1.2.4 Object Oriented Construction 1.3 Identifying the Elements of an Object Model 1.4 Identifying Classes and Objects 1.5 Specifying the Attributes (With Visibility) 1.6 Defining Operations 1.7 Finalizing the Object Definition	4
2	<b>Introduction to UML</b> 2.1 Concept of UML 2.2 Advantages of UML	6
3	<b>Basic Structural Modeling</b> 3.1 Classes 3.2 Relationship 3.3 Common Mechanism 3.4 Class Diagram (Minimum three examples should be covered)	5
4	<b>Advanced Structural Modeling</b> 4.1 Advanced Classes 4.2 Advanced Relationship 4.3 Interface 4.4 Types and Roles 4.5 Packages 4.6 Object Diagram (Minimum 3 examples should be covered)	3
5	<b>Basic Behavioral Modeling</b> 5.1 Interactions 5.2 Use Cases and Use Case Diagram with stereo types (Minimum three examples should be covered) 5.3 Interaction Diagram (Minimum two examples should be covered) 5.4 Sequence Diagram (Minimum two examples should be covered) 5.5 Activity Diagram (Minimum two examples should be covered) 5.6 State Chart Diagram (Minimum two examples should be covered)	6



6	<b>Object Oriented Analysis</b> 6.1 Iterative Development and the Rational Unified Process 6.2 Inception 6.3 Understanding Requirements 6.4 Use Case Model From Inception to Elaboration 6.5 Elaboration	3
7	<b>Object Oriented Design</b> 7.1 The Booch Method, The Coad and Yourdon Method and Jacobson Method and Raumbaugh Method 7.2 The Generic Components of the OO Design Model 7.3 The System Design Process 7.3.1 Partitioning the Analysis Model 7.3.2 Concurrency and Sub System Allocation 7.3.3 Task Management Component 7.3.4 The Data Management Component 7.3.5 The Resource Management Component 7.3.6 Inter Sub System Communication 7.4 Object Design Process	3

**References:**

- 1 The Unified Modeling Language User/Reference Guide by Grady Booch, James Rumbaugh Pearson Education INC
- 2 Object Oriented Software Engineering by Ivar Jacobson Pearson Education INC
- 3 Applying UML and Patterns by Craig Larman Pearson Education INC
- 4 Object Oriented Analysis and Design by Bennett, Simon McGraw Hill

### 3) Mobile Computing

Total lectures: 30 Credits: 02

Sem-V

#### Syllabus

#### Objectives

- To familiarize the students with the buzz words and technology of mobile communication
- Understand the GSM architecture
- Understand the issues relating to Wireless applications

Mobile Computing		
No	Topic	Lectures
1	<b>Chapter 1 : Introduction to Mobile Computing</b> <ul style="list-style-type: none"><li>• Introduction and need for Mobile computing</li><li>• Mobility and portability</li><li>• Mobile and Wireless devices</li><li>• Applications</li><li>• Brief History of wireless communication</li></ul>	1
2	<b>Chapter 2 : Wireless Transmission</b> <ul style="list-style-type: none"><li>• General Concepts of multiplexing and modulation</li><li>• Spread Spectrum</li><li>• Cellular Systems</li></ul>	2
3	<b>Chapter 3 : Medium Access Control Layer</b> <ul style="list-style-type: none"><li>• Why specialized MAC?<ol style="list-style-type: none"><li>a. hidden and exposed terminals</li><li>b. near and far terminals</li></ol></li></ul>	2
4	<b>Chapter 4 : Mobile IP</b> <ul style="list-style-type: none"><li>• Goals, assumptions and requirements</li><li>• Entities and terminologies</li><li>• Agent Discovery</li><li>• Registration</li><li>• Tunneling and encapsulation</li><li>• Optimization</li><li>• Reverse Tunneling</li><li>• IPv6</li><li>• IP micro-mobility support – Cellular IP, Hawaii, Hierarchical, mobile IPv6</li></ul>	6
5	<b>Chapter 5 : Mobile TCP</b> <ul style="list-style-type: none"><li>• Traditional TCP:-Congestion Control, Slow start, Fast retransmit / Fast recoveryImplications on mobility</li><li>• Classical TCP improvements:-Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit / Fast recovery, Transmission / Timeout freezing, Selective Retransmission, Transaction oriented TCP</li><li>• TCP over 2.5/3G wireless networks</li></ul>	5
6	<b>Chapter 6 : GSM</b> <ul style="list-style-type: none"><li>• Mobile Services (Bearer, Tele-and-supplementary services)</li><li>• System Architecture</li></ul>	6

	<ul style="list-style-type: none"> <li>○ Radio subsystem</li> <li>○ Network and switching subsystem</li> <li>○ Operation subsystem</li> <li>● Protocols</li> <li>● Localization and calling</li> <li>● Handover</li> <li>● Value Added Services <ul style="list-style-type: none"> <li>○ SMS: Architecture, Mobile Originated and Mobile Terminated procedures.</li> <li>○ Architecture, determination of Location Information, Location based services</li> </ul> </li> <li>● GPRS</li> </ul>	
7	<b>Chapter 7 : 3G mobile networks</b> <ul style="list-style-type: none"> <li>● UMTS System architecture, radio interface</li> <li>● UTRAN Architecture, Functions of RNC, Core network</li> </ul>	5
8	<b>Chapter 8 : Wireless Application Protocol</b> <ul style="list-style-type: none"> <li>● Architecture</li> <li>● Wireless datagram protocol</li> <li>● Wireless transport layer security</li> <li>● Wireless transaction protocol</li> <li>● Wireless session protocol</li> <li>● Wireless application environment</li> </ul>	3

### Reference Books

1. Mobile Communications Jochen Schiller, Pearson Education, 2nd Edition, ISBN : 9780321123817
2. Beginning Android Application Development by Wei-Meng Lee Wiley India ISBN:9788126531066
3. Mobile Networks GSM and HSCSD- NishitNarang, SumitKasera, TataMcGrawHill
4. Mobile Computing: Technology, Applications, and Service Creation by Asoke K. Talukder,

## 4) Core Java

Total lectures: 30 Credits: 02Sem –V

### Objective:

1. Introduce learners to the three most popular open source content management systems (CMS) in use on the web today, including WordPress, Drupal, and Joomla.
2. Understand the difference between a CMS website, a static website, and websites using other server-side technologies.

<b>Core Java</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
<b>1</b>	<b>An Introduction to Java</b> <ul style="list-style-type: none"><li>• A Short History of Java</li><li>• Features of Java</li><li>• Comparison of Java and C++</li><li>• Java Tools And Editors(Appletviewer, Jar, Jdb)</li><li>• Java Environment.</li></ul>	<b>2</b>
<b>2</b>	<b>An Overview of Java</b> <ul style="list-style-type: none"><li>• Types of Comments.</li><li>• Built In Data Types.</li><li>• Variables and Constants(Final Keyword Related to variables)</li><li>• Operators</li><li>• Memory Allocation Using new Operator.</li><li>• Output using println() method</li><li>• Control Statements.</li><li>• Arrays, static and dynamic</li><li>• Simple Java Program.</li></ul>	<b>2</b>
<b>3</b>	<b>Objects and Classes</b> <ul style="list-style-type: none"><li>• Defining Your Own Classes and Use of 'this' Keyword.</li><li>• Using Predefined Classes</li><li>• Object the cosmic class</li><li>• Constructor and Overloading Constructors</li><li>• Method Parameters</li><li>• Static Fields and Methods</li><li>• Access Specifiers (public, protected, private, friendly(default))</li><li>• <b>Creating</b> Accesses and using Packages</li><li>• Wrapper Classes</li><li>• Garbage Collection(finalize() Method)</li><li>• String class and String Buffer class</li></ul>	<b>5</b>
<b>4</b>	<b>Inheritance</b> <ul style="list-style-type: none"><li>• Inheritance Basics (extends Keyword) and Types of Inheritance Superclass, and Subclass and use of Super Keyword</li><li>• Method Overriding and Use of final keyword related to method and class</li><li>• Use of Abstract class</li></ul>	<b>5</b>
<b>5</b>	<b>Interfaces and Inner Classes</b> <ul style="list-style-type: none"><li>• Defining and Implementing Interfaces</li><li>• Object Cloning</li></ul>	<b>2</b>

	<ul style="list-style-type: none"> <li>• Inner Classes</li> </ul>	
<b>6</b>	<b>Exception Handling</b> <ul style="list-style-type: none"> <li>• Dealing Errors</li> <li>• Catching exception and exception handling</li> <li>• Creating user defined exception.</li> <li>• Using assertion</li> </ul>	<b>3</b>
<b>7</b>	<b>User Interface Components with AWT and Swing</b> <ul style="list-style-type: none"> <li>• What AWT ? What is Swing? Difference between AWT and Swing.</li> <li>• The MVC Architecture and Swing</li> <li>• Layout Manager and Layouts, The JComponent class</li> <li>• Components - Buttons and Labels (JButton, JLabel), Checkboxes and Radio Buttons (JCheckBox and JRadioButton), Lists and Combo Boxes (JList and JCombo) along with the JScrollPane Class, Menus – Jmenu and the JPopupMenu Class, JMenuItem and JCheckBoxMenuItem, Scrollbars and Sliders(JScrollBar and JSlider), Dialogs (Message, confirmation, input (like file selection) and options(like color chooser))</li> <li>• Event Handling: Event sources, Listeners, Adapters, Anonymous class</li> </ul>	<b>8</b>
<b>8</b>	<b>Applet Programming</b> <ul style="list-style-type: none"> <li>• Applet Life Cycle.</li> <li>• Applet HTML Tags.</li> <li>• Passing parameters to Applet</li> <li>• Repaint() and Update() method</li> </ul>	<b>3</b>

Reference Books:

- 1) Complete reference Java by Herbert Schildt(5th edition)
- 2) Java 2 programming black books, Steven Horlzner
- 3) Programming with Java , A primer ,Forth edition , By E. Balagurusamy
- 4) Java servlet Programming by Jason Hunter, O'Reilly
- 5) Core Java Volume-I-Fundamentals, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press.
- 6) Core Java Volume-II-Advanced Features, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press.

## 2) RDBMS

Total lectures: 30 Credits: 02Sem –V

### Objective:-

- To teach fundamental concepts of RDBMS (PL/PgSQL)
- To teach principles of databases
- To teach database management operations
- To teach data security and its importance
- To teach client server architecture

Prerequisites: Knowledge of DBMS

RDBMS		
No	Topic	Lectures
1	<b>Relational Database Design</b> <ul style="list-style-type: none"><li>• Preliminaries</li><li>• Functional Dependencies</li><li>• Basic concepts : Closure of a set of functional dependencies, Closure of attribute set, Canonical cover, Decomposition.</li><li>• PL/PgSQL: Datatypes, Language structure</li><li>• Controlling the program flow, conditional statements, loops</li><li>• Views</li><li>• Stored Functions, Stored Procedures</li><li>• Handling errors and exceptions</li><li>• Cursors</li><li>• Triggers</li></ul>	14
2	<b>Transaction Concepts and concurrency control</b> <ul style="list-style-type: none"><li>• Describe a transaction, properties of transaction, state of the transaction.</li><li>• Executing transactions concurrently associated problem in concurrent execution.</li><li>• Schedules, types of schedules, concept of Serializability, Precedencegraph for Serializability.</li><li>• Ensuring Serializability by locks, different lock modes, 2PL and its Variations.</li></ul>	6
3	<b>Database Integrity and Security Concepts</b> <ul style="list-style-type: none"><li>• Domain constraints</li><li>• Referential Integrity</li><li>• Introduction to database security concepts</li><li>• Methods for database security</li></ul> Discretionary access control method Mandatory access control and role base access control formultilevel security.	5
4	<b>Crash Recovery</b> <ul style="list-style-type: none"><li>• Failure classification</li><li>• Recovery concepts</li><li>• Log base recovery techniques (Deferred and Immediate update)</li><li>• Checkpoints</li><li>• Recovery with concurrent transactions (Rollback, checkpoints, commit)</li></ul>	3
5	<b>Client-Server Technology</b>	2

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• Describe client-server computing.</li><li>• Evolution of Client - Server information systems.</li><li>• Client – Server Architecture benefits.</li><li>• Client Server Architecture- Components, Principles, Client Components, Communication middleware components</li></ul> |  |
|---|--|

### **References:-**

1. Fundamentals of Database Systems (4th Ed) By: Elmasri and Navathe
2. Database System Concepts (4th Ed) By: Korth, Sudarshan, Silberschatz
3. Practical Postgre SQL O'REILLY
4. Beginning Databases with PostgreSQL, From Novice to Professional, 2nd Edition By Richard Stones , Neil Matthew, Apress

## 5) Web Development using CMS-I

Total lectures: 30 Credits: 02Sem –V

### Objective:

3. Introduce learners to the three most popular open source content management systems (CMS) in use on the web today, including WordPress, Drupal, and Joomla.
4. Understand the difference between a CMS website, a static website, and websites using other server-side technologies.

Web Development using CMS-I		
No	Topic	Lectures
1	<b>Introducing Content Management Systems.</b> 1.1 Review of Syllabus and other materials 1.2 Grading and attendance policies 1.3 Purchasing and configuring a domain name and web hosting 1.4 Exploring CMS terminology, including open source, PHP, MySQL, server-side, client-side, static HTML website, how CMS web pages are generated, and so forth. 1.5 Website strategy and planning, site mapping, content planning	5
2	<b>Introduction to Joomla</b> 2.1 Installing Joomla 2.2 Exploring the Admin Interface 2.3 Content creation using the CAM model 2.4 Content customization: images, video, audio, tags, formats, etc.	4
3	<b>Joomla Menus</b> 3.1 Adding and displaying menus 3.2 Linking menus to articles and other features	2
4	<b>Extending Joomla</b> 4.1 Finding and adding Joomla extensions 4.2 Must have extensions for any Joomla site 4.3 Adding and setting up 2 “big” extensions (choose blog, calendar, image gallery, Paypal-based shopping cart, or portfolio. Other extensions on approval)	4
5	<b>Custom Templates</b> 5.1 Creating customized Joomla templates 5.2 Modifying Joomla CSS and HTML parameters 5.3 Tweaking the Joomla backend 5.4 Mobile considerations	3
6	<b>Joomla User management and permissions</b> 6.1 User management 6.2 Permissions	3
7	<b>Introduction to WordPress</b> 7.1 WordPress.org vs. WordPress.com 7.2 Installing WordPress 7.3 Exploring the admin interface 7.4 Content creation: Posts vs. pages 7.5 Content customization: images, video, audio, tags, formats, etc.	4



## References:

1. Drupal 7 Explained: Your Step-by-Step Guide, Stephen Burge, ISBN 0133124231
2. WordPress: Visual QuickStart Guide, 3rd Edition, Matt Beck and Jessica Neuman Beck, ISBN 032195761X
3. Joomla! Explained: Your Step-by-step Guide Joomla! Press by Author: Stephen Burge

## Sem-VI

### 1) Computer Graphics

Total lectures: 30

Credits: 02

Sem-VI

#### Syllabus

#### Objective:

- To study how graphics objects are represented in Computer
- To study how graphics system in a computer supports presentation of graphics information
- To study how interaction is handled in a graphics system
- To study how to manipulate graphics object by applying different transformations
- To provide the programmer's perspective of working of computer graphics

<b>Computer Graphics</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
1	<b>Introduction to Computer Graphics</b> <ul style="list-style-type: none"><li>• Introduction to computer graphics &amp; graphics systems</li><li>• Components of Computer Graphics Representation, Presentation, Interaction and Transformations</li><li>• Applications of Computer Graphics</li><li>• Pixel/Point, Raster v/s Vector, RGB color model, intensity</li><li>• Programming essentials – event driven programming. OpenGL library</li></ul>	4
2	<b>Input devices and Interaction tasks</b> <ul style="list-style-type: none"><li>• Logical Interaction – Locator, valuator, pick and choice;</li><li>• Physical devices used for interaction – keyboard, mouse, trackball, spaceball, tablets, light pen, joy stick, touch panel, data glove;</li><li>• Keyboard, Mouse interaction in OpenGL</li><li>• Graphical User Interfaces- cursors, radio buttons, scroll bars, menus, icons</li><li>• Implementing GUI in open GL</li></ul>	4
3	<b>Presentation and Output devices</b> <ul style="list-style-type: none"><li>• Presentation Graphics - frame buffer, display file, lookup table;</li><li>• Display devices, Random and Raster scan display devices; CRT</li><li>• Hardcopy devices - Plotters and Printers</li></ul>	4
4	<b>Raster Scan Graphics</b> <ul style="list-style-type: none"><li>• Line drawing algorithms; DDA algorithm, Bresenham's line drawing algorithm, Circle generation algorithm;</li><li>• Scan conversions- Generation of the Display, Image compression</li><li>• Displaying Lines and characters</li><li>• Polygon filling -Scan converting polygons, fill algorithms, Boundary fill algorithm, flood fill algorithm</li></ul>	11
5	<b>Transformations</b> <ul style="list-style-type: none"><li>• Basic transformations: translation, rotation, scaling; Matrix representations &amp; homogeneous coordinates, Reflection, shear</li></ul>	7

	<ul style="list-style-type: none"><li>• Transformation of points, lines, parallel lines, intersecting lines. Viewing pipeline</li><li>• Window to viewport co-ordinate transformation. Setting window and viewport in OpenGL.</li></ul>	
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**References:**

1. Foley, Vandam, Feiner, Hughes – “Computer Graphics principles (2nd Ed.) – Pearson Education.
2. W. M. Newman, R. F. Sproull – “Principles of Interactive computer Graphics” – TMH.
3. Z. Xiang, R. Plastock – “Schaum’s outlines Computer Graphics (2nd Ed.)” – TMH

## 2) Software Testing

Total lectures: 30 Credits: 02

Sem-VI

### Syllabus

<b>Software Testing</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
1	<b>Software Testing</b> 1. Introduction 2. Nature of errors An example for Testing	2
2	<b>Software Testing Methods</b> 1. Testing Fundamentals, 2. Test Case Design, White Box Testing Black Box Testing	3
3	<b>Testing For Specialized Environments</b> 1. Testing GUI's 2. Testing of Client/Server Architectures 3. Testing Documentation and Help Facilities, 4. Testing for Real-Time Systems	5
4	<b>Software Testing Strategies</b> 1. Strategic Approach to Software Testing 2. Unit Testing, Integration Testing, Validation Testing ,System Testing	5
5	<b>Software metrics</b> 1. Introduction, 2. Basic Metrics, 3. Complexity Metrics	5
6	<b>Software Quality Assurance</b> 1. Concepts, 2. Quality Movement, 3. Background issues and SQA activities Software Reviews, Formal Technical Reviews, Formal approaches to SQA Statistical Quality Assurance, Software Reliability, 4. SQA Plan, 5. The ISO 9001 Quality Standard, Six sigma	4
7	<b>Quality Costs</b> 1. Quality Cost Measurement, 2. Utilizing Quality Costs for Decision-Making	3
8	<b>Testing Tools (Introduction and execution only)</b> Junit, Apache Jmeter, WinrunnerLoadrunner, Rational Robot	3

### References:

- 1) Software Engineering – A Practitioners Approach Roger S. Pressman Tata McGraw Hill
  - 2) Software Engineering for Students- A Programming Approach Douglas Bell Pearson Education
  - 3) Quality, 5th ed., Prentice-Hall, 2010. Donna C. S. Summers
  - 4) Total Quality Management, Prentice Hall, 2003. Dale H. Besterfield
  - 5) Software engineering: An Engineering approach, John Wiley. J.F.Peters, W.Pedrycz
- www.opensource testing .org

### 3) Mobile Programming Using Android

Total lectures: 30 Credits: 02

Sem-VI

#### Syllabus

**Objective:** This Course Introduces mobile application development for the Android platform. Students will learn skills for creating and deploying Android applications, with particular emphasis on software engineering topics including software architecture, software process, usability and deployment.

Mobile Programming Using Android		
No	Topic	Lectures
1	Introduction to Android <ul style="list-style-type: none"><li>• A little background about Mobile Technologies.</li><li>• Android- an Open Platform for Mobile Development.</li><li>• Android SDK Features.</li><li>• Android Versions and Features.</li></ul>	3
2	Tools for Development <ul style="list-style-type: none"><li>• Installing Android.</li><li>• First Android Application.</li><li>• Running on Emulator.</li><li>• Android Development Tools.</li><li>• Eclipse, IDEs and Tools.</li></ul>	2
3	Activities and Intents <ul style="list-style-type: none"><li>• Understanding Activities<ol style="list-style-type: none"><li>1. Life Cycle of Activities.</li><li>2. Applying Styles and Themes to an Activity.</li></ol></li><li>• Linking Activities Using Intents<ol style="list-style-type: none"><li>1. Resolving Intent Filter Collision.</li><li>2. Returning Results from an Intent.</li><li>3. Passing Data Using an Intent Object.</li></ol></li></ul>	6
4	Android User Interface <ul style="list-style-type: none"><li>• Understanding the components of a Screen.</li><li>• Creating User Interface Programmatically.</li><li>• Listening for UI Notifications.</li><li>• Using Basic Views- TextView, Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, and RadioGroup Views, ProgressBar View, AutoCompleteTextView View.</li><li>• Using Picker Views- TimePicker&amp;DatePicker View.</li></ul>	10
5	Android SQLITE Database <ul style="list-style-type: none"><li>• Introducing SQLite.</li><li>• Content Values and Cursors.</li><li>• Working with SQLite Databases<ol style="list-style-type: none"><li>1. Introducing the SQLiteOpenHelper.</li><li>2. Opening and Creating Databases Without the SQLiteOpenHelper.</li><li>3. Android Database Design Considerations</li><li>4. Querying a Database.</li><li>5. Extracting Values from a Cursor.</li><li>6. Adding, Updating, and Removing Rows</li></ol></li></ul>	9

**References:**

1. Professional Android 4 Application Development by Reto Meier- Wrox Publication.
2. Beginning Android 4 Application Development by Wei-Meng Lee- Wrox Publication.
3. <http://developer.android.com>

**4) Advanced Java**  
**Total lectures: 30    Credits: 02                      Sem-VI**

**Syllabus**

<b>Advanced Java</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
1	<b>Collection Framework</b> 1.1 Introduction to the Collection framework. 1.2 List – ArrayList, LinkedList and Vector, Stack, Queue 1.3 Set - HashSet, TreeSet, and LinkedHashSet 1.4 Map – HashMap, LinkedHashMap, Hashtable and TreeMap 1.5 Interfaces such as Comparator, Iterator, ListIterator, Enumeration	4
2	<b>Database Programming</b> 2.1 The design of jdbc, jdbc configuration 2.2 Types of drivers 2.3 Executing sql statements, query execution 2.4 Metadata – DatabaseMetadata, ResultSetMetadata	8
3	<b>Servlet</b> 3.1 Introduction to Servlet and Hierarchy of Servlet 3.2 Life cycle of servlet 3.3 Handling get and post request (HTTP) 3.4 Retriving a data from database to servlet 3.5 Session tracking – User Authorization, URL rewriting, Hidden form fields, Cookies and HttpSession	10
4	<b>JSP</b> 4.1 Simple first JSP program 4.2 Life cycle of JSP 4.3 Implicit Objects 4.4 Scripting elements – Declarations, Expressions, Scriptlets, Comments 4.5 JSP Directives – Page Directive, include directive 4.6 Example of forwarding contents from database to servlet, servlet to JSP and displaying it	4
5	<b>Multithreading</b> 5.1 What are threads? 5.2 Life cycle of thread 5.3 Running and starting thread using Thread class 5.4 Thread priorities 5.5 Running multiple threads 5.6 The Runnable interface 5.7 Synchronization and interthread communication	4

Reference Books:

- 1) Complete reference Java by Herbert Schildt(5<sup>th</sup> edition)
- 2) Java 2 programming black books, Steven Horlznner
- 3) Programming with Java , A primer ,Forth edition , By E. Balagurusamy
- 4) Java servlet Programming by Jason Hunter, O'Reilly
- 5) Core Java Volume-I-Fundamentals, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press.
- 6) Core Java Volume-II-Advanced Features, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press.





## 5) Multimedia

Total lectures: 30 Credits: 02

Sem-VI

### Syllabus

<b>Multimedia</b>		
<b>No</b>	<b>Topic</b>	<b>Lectures</b>
1	<b>Introduction to Multimedia</b> 1.1 What is multimedia? 1.2 History of Multimedia systems 1.3 Components of Multimedia Systems 1.4 Hypertext and Hypermedia 1.4.1 What is Hypertext and Hypermedia 1.4.2 Characteristics of Hypertext and Hypermedia 1.5 Applications of Multimedia System	4
2	<b>Multimedia Application Development</b> 2.1 Introduction 2.2 Conceptualization 2.2.1 Subject Matter/Theme 2.2.2 Target Audience 2.2.3 Objectives 2.3 Story 2.4 Flowline 2.5 Script 2.6 Storyboard 2.6.1 What is Storyboard 2.6.2 General Guidelines 2.6.3 Guidelines for Visual Elements 2.6.4 Guidelines for Animation 2.6.5 Guidelines for Text 2.6.6 Guidelines for Audio 2.7 Overview of multimedia Software tools 2.7.1 Digital Audio 2.7.2 Music sequencing notations 2.7.3 Image/Graphics editing 2.7.4 Animation	6
3	<b>Digital Representation</b> 3.1 Analog Representation 3.2 Digital Representation 3.3 Analog to digital Conversion 3.4 Digital to Analog Conversion	2
4	<b>Storage Technology</b> 4.1Magnetic Media 4.1.1 Hard Disk 4.1.2 RAID 4.2 Optical Media 4.2.1 CD Storage 4.2.2 CD standards 4.3 DVD 4.3.1 Sizes and Capacity of DVD 4.3.2 DVD Video 4.3.4 DVD audio	4

5	<b>Audio</b> 5.1 Basics of Digital Audio 5.1.1 What is Sound? 5.1.2 Characteristics of Sound 5.2.3 Digital Audio 5.2 Synthesizers 4.2.1 Types of Synthesizers 4.2.2 Characteristics of Synthesizers 5.3 Introduction to MIDI 5.3.1 What is MIDI 5.3.2 Components of MIDI 5.3.3 MIDI Messages 5.3.4 Channel Messages 5.3.5 System Messages 5.3.6 General MIDI	7
6	<b>Video</b> 6.1 Basics of Video 6.2 Video Signal Formats 6.2.1 Component Video 6.2.2 Composite Video 6.2.3 S-Video 6.3 Television Broadcasting Standards 6.3.1 NTSC 6.3.2 PAL 6.3.3 SECAM 6.4 Digital Video Standards	7

**References:**

1. Principles of Multimedia – Ranjan Parekh
2. Multimedia Systems Design – Prabhat K. Andleigh and KiranThakrar

### 3) Web Development using CMS-II

Total lectures: 30 Credits: 02 Sem –VI

#### Objective:

1. Introduce learners to the three most popular open source content management systems (CMS) in use on the web today, including WordPress, Drupal, and Joomla.
2. Understand the difference between a CMS website, a static website, and websites using other server-side technologies.

Web Development using CMS-II		
No	Topic	Lectures
1	<b>Introduction to Drupal</b> 1.1 Installing Drupal 1.2 Exploring the admin interface 1.3 Content customization: images, video, audio, tags, formats, etc.	4
2	<b>Drupal User management and permissions</b> 2.1 User management 2.2 Permissions	1
3	<b>Basic of Drupal</b> 3.1. Overview 3.2. Architecture 3.3. Main Menu 3.4. Blocks & Regions 3.5. Themes & Layouts 3.6. Static Pages 3.7. Create Blog	6
4	<b>Drupal Menu, Article and Pages</b> 4.1. Create Articles 4.2. Create Pages 4.3. Create Content, Modify Content , Delete Content , PublishContent 4.4. Menu Management	4
5	<b>DRUPAL E-COMMERCE</b> 5.1. Shopping Cart 5.2. Create Products 5.3. Create Categories 5.4. Set up Taxes 5.5. Set up Discounts 5.6. Receive Donations 5.7. Set up Shipping 5.8. Set up Payments 5.9. Invoice Generation	8
6	<b>Database Connectivity Using PHP with MySql</b> 6.1 Cerate DataBase, Connect and Use. 6.2. Select Query 6.3 Insert Query 6.4 Update Query 6.5 Delete Query	7

## References:

4. Drupal 7 Explained: Your Step-by-Step Guide, Stephen Burge, ISBN 0133124231
5. WordPress: Visual QuickStart Guide, 3rd Edition, Matt Beck and Jessica Neuman Beck, ISBN 032195761X
6. Joomla! Explained: Your Step-by-step Guide Joomla! Press by Author: Stephen Burge