

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Computer Science and Engineering

Semester-VI

- A) Course Code : 2033671(033)
B) Course Title : Multimedia Technology
C) Pre- requisite Course Code and Title : CFA
D) Rationale :

Multimedia is required to create action oriented phenomena in applications that can be hosted on website. Multimedia plays a huge role in entertainment (providing action and realism) in advertising, films and gaming industry and also be extremely effective in education (providing visualization and demonstrations of abstract ideas and concepts).

Adobe flash is an important and popular tool that is used to design such application suitable for web. In this course student will learn to use adobe flash to develop two dimensional animations. Developing animation requires fair knowledge about the graphics. Thus course also introduces basics of graphics using Photoshop. The students of this course will be able to design multimedia and animated rich content that can be hosted on the web.

E) **Course Outcomes:**

CO-1 Create a graphic image using design elements of Photoshop software.

CO-2 Change various attributes of a graphic image.

CO-3 Develop an animation sequence using various features of Flash Software.

CO-4 Develop 3D animations using various tools of Flash software.

CO-5 Develop an animation using action script of flash.

F) **Scheme of Studies:**

S.No.	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credit L+T+P/2
1.	Information Technology	2033671(033)	Multimedia Technology	3	4	1	6

G) **Scheme of Assessment:**

S.No.	Board of Study	Course code	Course title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1.	Information Technology	2033671(033)	Multimedia Technology	70	30	30	30	50	210

H) **Course-Curriculum Detailing:**

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

Convert unit of the given physical quantity from one-unit system to other.

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CO-1 Create a graphic image using design elements of Photoshop software.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
SO1.1 Explain Graphic s and color Fundam entals. SO1.2 Explain steps to create graphic image and optimiz e it using Photosh op softwar e	LI.1 Develop graphics lines, shapes, texture, filling colors using color palates, texturing LI.2 Develop a banner of recent activity in your collage or any festival..	Unit-1: The Elements of Design and Image Basics 1.1 Graphics Basics: Bitmap vs. vector based graphics, Color/bit depth and image resolution, Vector graphics vs. bitmap graphics, Standard selection vs. floating, selection, Tolerance and Opacity 1.2 Introduction to Color: Color modes-RGB, CMYK, grayscale, Hue, saturation, and brightness, Browser safe colors, Shadows, highlights and mid tones of an image Photoshop Interface, Tools and Options. 1.3 The Photoshop Interface, setting up a new Photoshop document, saving document, working with Photoshop palettes, Toolbox and Options bar, Using Guides and Ruler. 1.4 Photoshop Image and Color Basics: Supported import and export image formats, opening an Image, Creating images, Saving images, Basic image editing, Changing image size, Cropping, Changing color/bit depth, 1.5 Transforms :Using free transform , Move ,Rotate ,Scale, Skew , Distort , Perspective, Flip-vertical, horizontal ,Invert , Rotate 180º, Rotate 90º CW , Rotate 90º CCW	SL.1 Configure and installation of Photoshop SL.2 Optimizing Images using Save for Web

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- i. Write down the different steps for making a collage.

b. Mini Project:

- i. Design logo of college and university

CO-2 Change various attributes of a graphic image.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
SO2.1 Describe use of different Photoshop tools. SO2.2 Explain importance of layers. SO2.3 Explain the need for enhancement	LI2.1 Develop a collage of different images of different sizes and properties. LI2.2 Develop a	Unit-2: Photoshop tools for creating professional grade Images 2.1 Photoshop Tools: Toolbox shortcuts , Tools options, Marquees , Magic wand , Lassos , Move tool , Crop tool, Slice tools, Pencil , Paintbrush ,Eraser tools, History brushes, Gradient , Paint bucket , Burn-dodge-sponge, Blur-sharpen-smudge, Shapes-line-	SL2.1 Advantage and disadvantage of Layers SL2.2 Adding effects to text

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Session Outcomes	Laboratory	Classroom Instruction (CI)	Self Learning (SL)
<p>of images and color Corrections in image.</p> <p>SO2.4 Describe text editing tools for creating images.</p>	<p>webpage using Photoshop software.</p>	<p>rectangle-polygon , Path selection tool , Pen tool , Type tools , Notes tool-audio annotation, Eyedropper- color sampler-measure too, Hand-zoom, Quick mask-Screen modes, Jump to Image Ready, Back ground and foreground.</p> <p>2.2 Layers, Channels and Actions: About layers-fill and adjustment layers, The layer palette, Naming layers, Creating layers, Deleting layers, Viewing layers, Moving layers, Layer opacity. Locking layers, Merging layers, Layer modes and blending options, Image composting using layers</p> <p>2.3 Restoring and enhancing images : Restoring damaged photos , Photo retouching , Clone tamp-pattern stamp, Healing brush tool , Retouch tool, Photo enhancement and Color correction, Changing levels , curves, Color balance, brightness and contrast , hue saturation and brightness , Histogram, Gradient map , Desaturate, Invert ,Color replace, Selective color , Equalize, Threshold, Channel mixer, Posterize, Changing background using layer composting. Multimedia and Animation Techniques</p> <p>2.4 Text editing and special effects : types of layer, Creating vertical and horizontal types, Point and paragraph text creation, Using horizontal and vertical type mask tools, Using character palette for text editing, Choosing a font, type size, type color , Specifying kerning and tracking, Using fractional character widths , Specifying baseline shift , Applying underline and strikethrough , Text alignment and justification , Specifying anti-aliasing ,Creating text warp , Rasterizing type, Converting type to shapes</p>	

SW-2 Suggested Sessional Work (SW) :

- a. Assignments:**
 - i. Write down the different steps for Creating documents based on layers and setting image resolution
- b. Mini Project:**
 - i. Design a banner for different college activities.
- c. Other Activities (Specify):**

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CO-3 Develop an animation sequence using various features of Flash Software.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Interaction(CI)	Self Learning (SL)
<p>SO3.1 Explain basic concepts of vector graphics and flash environment.</p> <p>SO3.2 Explain steps to develop flash animations using various tools.</p>	<p>LI3.1 Develop, test and debug small flash application.</p>	<p>Unit-3: Fundamentals of Flash software:</p> <p>3.1 Environments and tools: Bitmap Vs vector graphics, Image Vs Movie, Conventional Animation Vs Flash animations, Concepts of Frame Rate and Resolution, PAL, NTSC and Film Standards</p> <p>3.2 Exploring The Flash Interface: The Flash stage, Stage Settings, Creating a new Flash file, The various import formats, Timeline-Play head/Frames/Key Frames/ Blank frames, Menus, Toolbox and Properties, Keyboard shortcuts and Preferences, Color Swatches and Color Mixer, Rulers, Guides, Grids and Snappings, Common Libraries, Debugger and Output, Movie Explorer</p> <p>3.3 Basic drawing and Selections: Applying the Pencil and Eraser tools, Drawing with the Pen tool, Creating custom line styles, Selection Tools -Arrow Tools, and Lasso Tool, Navigation Tools -Hand and Zoom Tools</p> <p>3.4 Shapes: Basic shapes, Creating rectangles, ovals, and circles, polystar, Creating freeform shapes, Selecting and editing shapes, Using the Selection and Lasso tools, Transforming Multimedia and Animation Techniques shapes, Copying, moving, and deleting a shape, Grouping and aligning objects</p> <p>3.5 Color: Applying color, Using the Paint Bucket and Ink Bottle tools, Using the Eyedropper and Brush tools, Fill Transform Tool, Custom colors and gradients, Creating a custom color swatch, Applying gradients, Creating a custom gradient</p> <p>3.6 Text : The Text tool, Creating an extending text block, Creating a fixed text block, Text formatting, Changing font styles, text block, Aliasing small text, kerning of text, Setting line spacing/ margins/indentation,</p>	<p>SL3.1 Configure flash tools</p> <p>SL3.2 Text utilities, Using the Find and Replace feature, Using the Spell Checker feature, History panel.</p>

SW-3 Suggested Sessional Work (SW) :

- a. Assignments:**
 - i. Create small animation like text animation, candle animation, image slider etc.
- b. Mini Project:**
 - i. Create an animation on happy holiday theme.
- b. Other Activities (Specify):**

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CO-4 Develop 3D animations using various tools of Flash software.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
<p>SO4.1 Discuss importance of layers and detailed steps to create application using layers.</p> <p>SO4.2 Explain frames, time-line and discuss detailed steps to develop applications using it.</p> <p>SO4.3 Explain animation concepts and write detailed steps to develop animated applications</p> <p>SO4.4 Write detailed steps to include sound and embedding videos</p>	<p>LI4.1 Develop, test and debug small applications with flash players.</p> <p>LI4.2 Develop, test and debug small applications with flash symbols and instances.</p> <p>LI4.3 Develop, test and debug small applications with flash animation.</p>	<p>Unit-4: Symbols, Animation And Organizing Projects</p> <p>4.1 Layers : Layer basics, Merging ,rearranging, Deleting, Modifying, Renaming, Locking and hiding, Masking, Layers Folders ,Creating layer folders, Guide layers, Creating a guide layer, Controlling the speed of a motion tween, Arranging and extending frames</p> <p>4.2 Scenes and Frame Labels: Creating and Organizing Scenes & frame labels</p> <p>4.3 Symbols and Instances: Using and managing the Symbol Library, Graphic Symbols, Movie Clip Symbols, Managing the Timeline of Movie Clip with the main Timeline, Button Symbols, Creating and editing a button symbol, Controlling tints, brightness and transparency of instances</p> <p>4.4 Animation: Timeline, Frames and Key Frames, Creating and manipulating animations, Creating a basic frame-by-frame animation, Using Onion Skin to modify an animation, shape tweening and hinting, motion tweening with a guide, Mask Animations</p>	<p>SL4.1 Configure flash with symbols, animation, sound, embedding videos.</p> <p>SL4.2 Working with sound and embedding videos</p>

SW-4 Suggested Sessional Work (SW):

- a. **Assignments:**
 - i. Create a flash movie to create a minimum of five layers (Water, fish, bubbles, plants etc)
- b. **Mini Project:**
 - i. Create any animation using layers, sound and embedding videos.
- c. **Other Activities (Specify):**

CO-5 Develop an animation using action script of flash

Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
<p>SO5.1 Describe the importance of ActionScript.</p> <p>SO5.2 Describe steps to create movie using</p>	<p>LI5.1 Develop, test and debug simple application, movie application using actionscript.</p> <p>LI5.2 Develop, test</p>	<p>Unit-5: Introduction To ActionScript</p> <p>5.1 Introduction : Understanding Object Oriented Programming, When to Use ActionScript, Introducing the Actions Panel, Working in Normal Mode, Expert</p>	<p>SL5.1 Configuration and execution of ActionScript.</p> <p>SL5.2 Publishing A flash movie; changing publish</p>

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
ActionScripts. SO5.3 Write various ActionScript using loops, variables and arrays. SO5.4 Write scripts to modify existing objects of movie. SO5.5 Describe steps to publish flash movie.	and debug simple application using timeline actionsript.	Mode, Reference Panel, ActionScript Syntax. 5.2 Creating ActionScript Movies: About Flash Symbol Types, Adding an Action to a Key frame, an Object, a Button, Planning Your ActionScript Movie, Tips for Creating Code, Dissecting an ActionScript. 5.3 Controlling The Timeline With ActionScript: Starting and Stopping the Movie, Navigating to Frames and Scenes, Creating an Interactive Animation, Navigating to URLs, Opening a URL in a Different Browser Window, Load and unload movie. 5.4 Creating ActionScript Loops, Looping Between Frames, Creating a For Loop, while and do while 5.5 Working With Variables And Arrays: Variable Data Types, Variable and Array Naming Conventions, Working with Arrays, Getting Data From an Array. 5.6 Modifying An Object With ActionScript: Creating a Movie Clip, Movie Clip Instances, Using the Set Property Action, Changing an Object's, Getting an Object's Properties 5.7 Using ActionScript with Text: Creating Input Text Blocks, Creating Dynamic Text Blocks, Loading Text From an External Document, Creating Rich Formatted Text.	settings.

SW-5 Suggested Sessional Work (SW) :

- a. **Assignments:**
 - i. Write down different features and applications of action script.
- b. **Mini Project:**
 - i. Develop an small application using action script.
- c. **Other Activities (Specify):**

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESA of Classroom Instruction CI+SW+SL):

Unit Number	Unit Title	Total Marks
1	The Elements of Design and Image Basics	14
2	Photoshop tools for creating professional grade Images	14
3	Fundamentals of Flash software	14
4	Symbols, Animation And Organizing Projects	14
5	Introduction To ActionScript	14
Total		70

J) Suggested Specification Table (For ESA of Laboratory Instruction*):

Note: The student at the end of semester examination of **30 Marks**; has to undertake any **ONE** of the listed practical's.

Laboratory Instruction Number	Short Laboratory Experiment Title	Total Marks
1.	Develop graphics lines, shapes, texture, filling colors using color palates, texturing.	30 Marks are allocated for performance under ESA
2.	Develop a banner of recent activity in your collage or any festival.	
3.	Develop a collage of different images of different sizes and properties.	
4.	Develop a webpage using Photoshop software.	
5.	Develop, test and debug small flash application.	
6.	Develop, test and debug small applications with flash players.	
7.	Develop, test and debug small applications with flash symbols and instances.	
8.	Develop, test and debug small applications with flash animation.	
9.	Develop, test and debug simple application, movie application using ActionScript.	
10.	Develop, test and debug simple application using timeline ActionScript.	

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Industrial visits
6. Industrial Training
7. Field Trips

8. Portfolio Based Learning
9. Role Play
10. Demonstration
11. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
12. Brainstorming
13. Others

L) Suggested Learning Resources:

(a) Books :

S. No.	Title	Author	Publisher	Edition & Year
1.	Adobe Photoshop CC Classroom in a Book	AndrewFaulkner, Conrad Chavez	Pearson	First edition (15 June 2018)
2.	Adobe Flash Professional CS5 Bible	Todd Perkins	Wiley	latest
3.	ActionScript for Flash MX: The Definitive Guide	Colin Mook	O'Reilly Media	2nd Edition
4.	Macromedia Flash MX Bible	Robert Reinhardt and Snow Dowd	Wiley	latest

(b) Open source software and website address:

- i. Software: Adobe flash 4.0 or higher version, Adobe Photoshop CC2020 or higher version, flash compatible browsers
- ii. <http://www.codecademy.com/learn>
- iii. www.photoshopesentials.com
- iv. www.adobeknowhow.com
- v. <http://www.webdevelopersnotes.com/tutorials/flash/>
- vi. <http://www.adobe.com/devnet/flash.html>
- vii. http://www.adobe.com/support/flash/tutorial_index.html
- viii. <http://www.thefreecountry.com/webmaster/flash.shtml>

M) List of Major Laboratory Equipment and Tools:

- i. Computer System with latest configuration and memory, laptops, servers
- ii. Open source Free software for animations /editors for html5/css3
- iii. Multimedia projector
- iv. Internet Access
- v. Access to library resources

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs) Titles	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	Basic knowledge PO-1	Discipline knowledge PO-2	Experiments & Practice PO-3	Engineering Tools PO-4	The Engineer & Society PO-5	Environment & Sustainability PO-6	Ethics PO-7	Individual & Team work PO-8	Communication PO-9	Life Long learning PO-10	PSO-1	PSO-2
CO-1 Create a graphic image using design elements of Photoshop software.	3	2	3	2	1	1	1	3	2	3	2	2
CO-2 Change various attributes of a graphic image.	3	2	3	2	1	1	1	2	2	2	2	2
CO-3 Develop an animation sequence using various features of Flash Software.	3	3	3	3	2	1	2	3	2	3	2	2
CO-4 Develop 3D animations using various tools of Flash software.	3	3	3	2	2	1	1	3	2	3	2	2
CO-5 Develop an animation using action script of flash.	3	3	3	2	1	1	1	2	2	2	2	2

Legend: 0- No Correlation, 1- Low, 2- Medium, 3- High

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O) Course Curriculum Map:

POs & PSOs No.	COs No.	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO1-PO10 PSO1-PSO2	CO-1 Create a graphic image using design elements of Photoshop software.	SO1.1 - SO1.2	LI1.1 - LI1.2	Unit 1.0: The Elements of Design and Image Basics	SL1.1 SL1.2
PO1-PO10 PSO1-PSO2	CO-2 Change various attributes of a graphic image.	SO2.1 - SO2.4	LI2.1 - LI2.2	Unit 2.0: Photoshop tools for creating professional grade Images	SL2.1 SL2.2
PO1-PO10 PSO1-PSO2	CO-3 Develop an animation sequence using various features of Flash Software.	SO3.1 - SO3.2	LI3.1	Unit 3.0: Fundamentals of Flash software	SL3.1 SL3.2
PO1-PO10 PSO1-PSO2	CO-4 Develop 3D animations using various tools of Flash software.	SO4.1 - SO4.4	LI4.1 - LI4.3	Unit 4.0: Symbols, Animation And Organizing Projects	SL4.1 SL4.2
PO1-PO10 PSO1-PSO2	CO-5 Develop an animation using action script of flash.	SO5.1 - SO5.5	LI5.1 - LI5.2	Unit 5.0: Introduction To ActionScript	SL5.1 SL5.2

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

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- A) Course Code : 2022672(022)
B) Course Title : Cloud Computing
C) Pre- requisite Course Code and Title : Computer Networks, Computer Architecture
D) Rationale :

This course will enable Diploma Engineers to access the inexpensive software, infrastructure and platform through very simple API's that are based on a pay-per -use model, so that renting these resources is much cheaper than acquiring dedicated new ones. Its practice would allow use of shared resources through a network of remote servers, which store and manage the data on the Internet. By using Cloud Computing, one might access services such as data security, scalability, easy accessibility and sharing of data with zero maintenance and easy data recovery.

- E) **Course Outcomes:** The course content should be taught and implemented with the aim to develop the following outcomes in the students.

CO-1: Describe Cloud Computing

CO-2: Enlist factors affecting Cloud Computing

CO-3: Describe Cloud Computing Architecture

CO-4: Comprehend models of Cloud Computing

CO-5: Comprehend Core Elements of Data Centre & Virtualization

- F) **Scheme of Studies**

Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
			L	P	T	Total Study Hours (L+T+P)	Total Credits(C) (L+T+P/2)
Computer Science and Engineering	2022672(022)	Cloud Computing	2	2	1	5	4

- G) **Scheme of Assessment**

Board of Study	Course code	Course Title	Scheme of Examination					
			Theory			Practical		Total Marks
			ESE	CT	TA	ESE	TA	
Computer Science and Engineering	2022672(022)	Cloud Computing	70	30	30	30	50	210

- H) **Course-Curriculum Detailing:**

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessionals Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Describe Cloud Computing

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO1.1 Define cloud computing SO1.2 describe need of cloud computing SO1.3 describe history of cloud computing SO1.4 describe benefits of cloud computing. SO1.5 understand limitations of cloud computing SO1.6 Explain elastic computing	LI1.1 Install Virtualbox/VMware Workstation	Unit-1.Overview of Cloud Computing 1.1 Essentials of Cloud Computing 1.2 Need of Cloud Computing 1.2.1 Reduced Costs 1.2.2 Scalability 1.2.3 Remote Access 1.2.4 Disaster Relief 1.2.5 Ease of Implementation 1.2.6 Skilled Vendors 1.2.7 Response Time 1.2.8 Easy to Customise 1.2.9 Virtual Provisioning 1.2.10 Fully Automated Storage Tiering-FAST 1.3 History of Cloud Computing 1.3.1 Client Server Technology 1.3.2 Peer to Peer Approach 1.3.3 Distributed Computing 1.3.4 Evolution of Cloud Computing 1.3.5 Benefits of Cloud Computing 1.3.6 Limitations of Cloud Computing 1.4 Elastic Computing	SL1.1 Difference between Cloud Computing & Internet. SL 1.2 Challenges of Cloud Computing SL 1.3 Various Vendors of Cloud Computing

SW-1 Suggested Sessional Work (SW):

a. Assignments

- i. How is traditional Data Center different from a cloud data center?
- ii. How is cloud computing beneficial?
- ii. What is the need of elastic computing?

CO-2 Enlist factors affecting Cloud Computing

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO2.1 Understand cloud data center requirement SO2.2 Describe architectural, technological and operational influences on cloud computing. SO2.3 Understand influences of cloud on various business.	LI2.1 Configure various virtualization tools such as Virtual Box, VMware workstation LI2.2 Implementation of SOAP Web services in C#/JAVA Applications. LI2.3 To study and implementation of Storage as a Service	Unit-2.0 Factors of Cloud Computing 2.1 Cloud Data Center Requirements 2.1.1 Architectural Influences 2.1.2 Operational Influences 2.2 Influence of Cloud Computing on Business Companies 2.2.1 Business Alignment 2.2.2 Governance	SL2.1 Enterprise Grid Computing SL 2.2 Open Source Software SL 2.3 IT Service Management

SW-2 Suggested Sessional Work (SW):

a. Assignments

- i. How does cloud computing influence business and governance?
- ii. How is data quantity important for cloud computing?

b. Mini Project

- i. How does business grow with the help of cloud computing? Perform a case study.

c. Other Activities (Specify)

- i. A Seminar on cloud IT modes- Saas, laas and PaaS

CO-3 Describe Cloud Computing Architecture

(Approx. Hrs: CI+LI+SW+SL=12)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO3.1 Comprehend characteristics of cloud computing. SO3.2 Define Grid Computing SO3.3 Explain important features of cloud and grid computing	LI3.1 Install and use a generic cloud environment that can be used as a private cloud. LI3.2 To study and implementation of identity LI3.3 To Study Cloud security management	Unit-3.0 Cloud Computing Architecture 3.1 Grid Computing framework 3.2 Grid Architecture 3.2.1 Advantages of Grid Computing 3.2.2 Challenges of Grid Computing 3.3 Cloud Computing Architecture 3.4 Key Design aspects of Cloud	SL3.1 Similarities and differences between Grid and Cloud Computing

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		Architecture, Cloud Services and Cloud Applications 3.5 Characteristics of Cloud and Grid Computing	

SW-3 Suggested Sessional Work (SW):

a. Assignments

- i. What are the different services provided by cloud computing?
- ii. What are the application area that is fully as per the requirement of grid computing?

b. Other Activities (Specify)

- i. A Seminar on ‘Architecture of Grid and Cloud Computing’

CO-4 Comprehend models of Cloud Computing

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Comprehend service models of cloud computing SO4.2 Describe cloud services provided by SaaS, IaaS and PaaS SO4.3 Describe cloud stack and cloud storage SO4.4 Differentiate various deployment models SO4.5 List the benefits of service models.	LI4.1 Study and implementation of infrastructure as Service using Open Stack. LI4.2 Write a program for Web feed using PHP and HTML LI4.3 Write a Program to Create, Manage and groups User accounts in own Cloud by Installing Administrative Features. LI4.4 Design an Assignment to retrieve, verify, and store user credentials using Firebase Authentication, the Google App Engine standard environment, and Google Cloud Data store.	Unit-4.0 Models of Cloud Computing 4.1 Cloud Service Models 4.1.1 Software as a Service 4.1.2 Platform as a Service 4.1.3 Infrastructure as a Service 4.2 Cloud Computing Sub Service Models 4.2.1 Everything as a Service 4.2.2 Compliance as a Service 4.2.3 Identity as a Service 4.2.4 Database as a Service 4.2.5 Storage as a Service 4.2.6 Communication as a Service 4.2.7 Security as a Service 4.2.8 Monitoring as a Service 4.2.9 Desktop as a Service 4.2.10 Compute Capacity as a Service 4.3 Cloud Deployment	SL4.1 Alternative Deployment Models SL4.2 Cloud stack SL4.3 Cloud storage

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		Models 4.3.1 Public Clouds 4.3.2 Private Clouds 4.4.3 Community Clouds 4.4.4 Hybrid Clouds	

SW-4 Suggested Sessional Work (SW):

a. Assignments:

- i. What are the various points to be considered when client opts for SaaS?
- ii. Explain the services provided to an application developer by cloud providers.

b. Mini Project:

- i. Create a short slide show of any event organized in college.

c. Other Activities (Specify)

- i. A Seminar on different types of cloud service models

CO-5 Comprehend Core Elements of Data Centre & Virtualization

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO5.1 Comprehend the core elements of cloud data center	LI5.1 Create single node Hadoop Installation.	Unit-5.0 Cloud Data Centre and Virtualization 5.1 Cloud Data Center core elements 5.2 Storage Network Technologies and Virtualization 5.3 Object based storage technologies 5.4 Cloud Backup 5.5 Cloud and Disaster recovery 5.6 Traditional Data Centre Management 5.7 Virtualization Technology 5.7.1 At Server 5.7.2 At Network 5.7.3 At Desktop and Application	SL5.1 Information Life Cycle Management
SO5.2 Describe the different storage options	LI5.2 Case Study: PAAS(Facebook, Google App Engine)		SL5.2 Replication Technologies
SO5.3 Describe RAID technology and its advantage	LI5.3. Case Study: Amazon Web Services.		SL5.3 Cloud Analytics
SO5.4 Understand database and its management			
SO5.5 Describe cloud analytics			
SO5.4 Understand traditional data centre management			
SO5.5 Comprehend Virtualization			

SW-5 Suggested Sessional Work (SW)

a. Assignments:

- i. What are the different ways to manage traditional data centers?
- ii. What are the various storage devices used in cloud data centers?
- iii. Explain the key management activities of a traditional data center?

b. Other Activities (Specify)

- iii. A seminar on 'Network Virtualization'

F) Suggested Specification Table (For ESA of Classroom Instruction)

Unit Number	Unit Titles	Total Marks
1	Overview of Cloud Computing	14
2	Factors of Cloud Computing	14
3	Cloud Computing Architecture	14
4	Models of Cloud Computing	14
5	Cloud Data Centre and Virtualization	14
Total		70

G) Suggested Specification Table (For ESA of Laboratory Instruction*)

S.No/ Units	List of Practical	Total Marks
1	Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8. 2.	30 Marks are allocated for performance under ESA
2	Configure various virtualization tools such as Virtual Box, VMware workstation	
3	Implementation of SOAP Web services in C#/JAVA Applications.	
4	To study and implementation of Storage as a Service	
5	Install and use a generic cloud environment that can be used as a private cloud.	
6	To study and implementation of identity	
7	To Study Cloud security management	
8	Study and implementation of infrastructure as Service using Open Stack.	
9	Write a program for Web feed using PHP and HTML	
10	Write a Program to Create, Manage and groups User accounts in own Cloud by Installing Administrative Features.	
11	Design an Assignment to retrieve, verify, and store user credentials using Firebase Authentication, the Google App Engine standard environment, and Google Cloud Data store.	
12	Create Single node Hadoop installation.	
13	Case Study: PAAS(Facebook, Google App)	
14	Case Study: Amazon Web Services.	

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals

H) Suggested Instructional/Implementation Strategies

1. Improved Lecture, Tutorial, Group Discussion, Industrial visits
2. Field Trips, Portfolio Based Learning, ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Facebook, Mobile)
3. Brainstorming, Others

L) Suggested Learning Resources-books

S. No.	Titles	Author	Publisher	Edition & Year
1.	Cloud Computing	Shailendra Singh	Oxford Higher Education	2018 or latest
2.	Cloud Computing: Bible	Barrie Sesinky	Wiley	2011 or latest
3.	Mastering Cloud Computing	Rajkumar Buyya, Christian Vecchiola , S Thamarai Selvi	Mc Graw Hill Education (India) Pvt. Ltd.	2003 or latest
4.	Cloud Computing: Concept Technology Architecture	Erl	Pearson	2014 or latest
5.	Cloud Computing for Dumies	Judith Hurwitz, Robin Bloor, Marcia Kaufman, and Dr. Fern Halper	Wiley	2009 1 st Edition

(a) Open source software and website address

1. Cloud computing tutorial-
https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf
2. Computer course, Ravi Kant Taxali-
https://books.google.co.in/books/about/COMPUTER_COURSE.html?id=PfHftdSmNBkC&redir_esc=y
3. Cloud Computing Tutorial for Beginners -<https://www.guru99.com/cloud-computing-for-beginners.html>

M) List of Major Laboratory Equipment, Tools& Software :NIL

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N) Mapping of POs & PSOs with COs

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)	
	PO-1 Basic and Discipline specific knowledge	PO-2 Problem analysis	PO-3 Design/development of solutions	PO-4 Engineering Tools, Experimentation and Testing	PO-5 Engineering practices for society, sustainability and environment	PO-6 Project Management	PO-7 Life-long learning	PSO-1	PSO-2
CO-1 Describe Cloud Computing	3	3	3	3	3	2	3	3	3
CO-2 Enlist factors affecting Cloud Computing	3	3	3	3	3	2	3	3	3
CO-3 Describe Cloud Computing Architecture	3	3	3	3	3	2	3	3	3
CO-4 Comprehend models of Cloud Computing	3	3	3	3	3	2	3	3	3
CO-5 Comprehend Core Elements of Data Centre & Virtualization	3	3	3	3	3	2	3	3	3

Legend:0 - No correlation,1 – Low, 2 – Medium, 3 – High

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O) Course Curriculum Map

POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
PO1,2,3,4, 5,6,7 PSO1,2	CO-1 Describe Cloud Computing	SO1.1-SO1.6	LI.1.1 - LI1.1	Unit-1.Overview of Cloud Computing	SL1.1 - SL1.3
PO1,2,3,4, 5,6,7 PSO1,2	CO-2 Enlist factors affecting Cloud Computing	SO2.1-SO2.3	LI.2.1 - LI2.3	Unit-2.0 Factors of Cloud Computing	SL2.1 - SL2.3
PO1,2,3,4, 5,6,7 PSO1,2	CO-3 Describe Cloud Computing Architecture	SO3.1-SO3.5	LI.3.1 - LI3.4	Unit-3.0 Cloud Computing Architecture	SL3.1
PO1,2,3,4, 5,6,7 PSO1,2	CO-4 Comprehend models of Cloud Computing	SO4.1-SO4.5	LI.4.1 - LI4.3	Unit-4.0 Models of Cloud Computing	SL4.1 - SL4.3
PO1,2,3,4, 5,6,7 PSO1,2	CO-5 Comprehend Core Elements of Data Centre & Virtualization	SO5.1 - SO5.5	LI.5.1 - LI5.3	Unit-5.0 Cloud Data Centre and Virtualization	SL5.1 - SLI5.3

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning.

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- A) **Course Code** : 2022673(022)
B) **Course Title** : Computer Troubleshooting and Maintenance
C) **Pre- requisite Course Code and Title** : CFA, Computer Network
D) **Rationale** :
This course is aimed at developing an insight towards computer hardware/software and its common errors/faults. After, the course, the students should be able to detect the failure, identify the root cause and suggest a speedy and effective resolution. This course will also enable students to maintain a healthy hardware and prevent computer from virus infections by following best practices for computer maintenance.

- E) **Course Outcomes** :
- CO-1 Identify fundamental problems in computer troubleshooting
 - CO-2 Apply troubleshooting procedures for finding motherboard, processor and memory faults
 - CO-3 Apply troubleshooting techniques to rectify storages faults
 - CO-4 Apply troubleshooting techniques to rectify display and power supply faults
 - CO-5 Apply preventive measures for computer and network maintenance

F) **Scheme of Studies:**

Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
			L	P	T	Total Study Hours (L+T+P)	Total Credits(C) (L+T+P/2)
Computer Science and Engineering	2022673(022)	Computer Troubleshooting and Maintenance	2	2	1	5	4

G) **Scheme of Assessment:**

Board of Study	Course code	Course Title	Scheme of Examination					
			Theory			Practical		Total Marks
			ESE	CT	TA	ESE	TA	
Computer Science and Engineering	2022673(022)	Computer Troubleshooting and Maintenance	70	30	30	30	50	210

Note: Separate passing is must for Progressive and End Semester Assessment.

H) **Course-Curriculum Detailing:**

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

Convert unit of the given physical quantity from one-unit system to other.

CO-1: Identify fundamental problems in computer troubleshooting.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO1.1 Define computer troubleshooting SO1.2 Classify types of faults SO1.3 Define software infections/viruses	LE1.1 Identify computer hardware and its type LE1.2 Illustrate examples of each type of hardware/software fault LE1.3 Study of anti-virus programs, installing antivirus programs	Unit 1.0 Computer troubleshooting fundamentals 1.1 Basics of troubleshooting and diagnosis 1.2 Classification of faults 1.2.1 Hardware faults 1.2.2 Software faults 1.3 Software infections/Virus	1.1 Types of hardware faults - Static faults, Dynamic faults Types of software faults- System software fault, application software faults and device driver software 1.2 Symptoms of virus infection 1.3 Types of viruses/software infections

SW-1 Suggested Sessional Work (SW):

- a. Assignments:**
 - i. List the common hardware/software faults along with their resolution
- b. Mini Project:**
 - i. Not applicable
- c. Other Activities (Specify):**
 - i. Install antivirus programs, activate/de-activate anti-virus
 - ii. Format PC, laptop

CO-2 Apply troubleshooting procedures for finding motherboard, processor and memory fault.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Discuss types and features of motherboard SO2.2 Identify types of chipsets SO2.3 Identify different types of ports used in motherboard SO2.4 Identify different types of buses used in motherboard SO2.5 Apply troubleshooting techniques to rectify the fault in motherboard	LE2.1 Study the various components of motherboard LE2.2 Illustrates examples of each types of chipsets LE2.3 Identification of motherboard related problems, possible cause and resolution LE2.4 Identification of processor related problems, possible cause and resolution LE2.5 Identify the BIOS related error	Unit 2. Motherboards, Processors, and Memory 2.1 Types and features of motherboard 2.2 Chipsets, Ports, Buses and Expansion slots 2.3 Motherboard Troubleshooting 2.4 Processor 2.4.1 Processor Features 2.4.2 Processor troubleshooting techniques	1. Study different features of a motherboard, including motherboard, sockets, chipsets, buses, expansion slots, and onboard ports and connectors 2. learn different types and brands of processors 3. How startup BIOS controls the boot process and booting a computer

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.6 Discuss features of processor SO2.7 Discuss the functions of BIOS SO2.8 Apply the troubleshooting techniques to identified errors relate to BIOS and POST SO2.9 Discuss different memory modules SO2.10 Apply memory troubleshoot techniques	messages, beeps codes, possible cause and resolution LE2.6 Identification of memory related problem, possible cause and resolution	2.5 BIOS 2.5.2 Functions of BIOS 2.5.3 Booting process 2.5.4 Beep Codes, Error messages, Post-Faults related to Hardware 2.6 Memory 2.6.1 Memory Modules 2.6.2 SIMMs, DIMMs, and RIMMs 2.6.3 Memory troubleshooting	4. List the steps to perform booting process

SW-2 Suggested Sessional Work (SW) :

a. Assignments:

Search the Web sites of Intel and AMD (www.intel.com and www.amd.com), and print information on the following:

- a. The most recent processor for a desktop offered by each company
- b. The most recent processor for a laptop offered by each company

b. Mini Project:

Draw a diagram of the motherboard and label these parts:

- i Processor (Include the prominent label on the processor housing.)
- ii RAM (each DIMM slot)
- iii CMOS battery
- iv Expansion slots (Identify the slots as PCI, PCIe x1, PCIe x4, PCIe x16, and AGP.)
- v Each port coming directly from the motherboard
- vi Power supply connections
- vii SATA or IDE drive connectors and floppy drive connector

c. Other Activities (Specify):

- i. Create a program to check the steps of troubleshooting. Throw an output if one succeeds in arranging the steps in correct order

CO- 3 Apply troubleshooting techniques to rectify storages faults.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO3.1 Discuss the working concept, types of hard disk drive SO3.2 Discuss different interfaces SO3.3 Define working principle of solid state	LE3.1 Identification of fault symptoms –errors, related to hard drive LE3.2 Disk formatting LE3.3 Creation of logical disk drives LE3.4 Dismantle and assemble different storage devices	Unit 3.0 Storage Devices 3.1 Anatomy of a Hard Drive 3.2 Hard Drive Interfaces: IDE, SCSI 3.3 Solid-State Drives 3.1 SSD types, advantages, disadvantages	3.1 Structure of Hard disk and its components 3.2 Steps to dismantle/assemble the components of different storage devices

Session Outcomes	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
drives SO3.4 Apply concept formatting and partitioning SO3.5 Apply optimizing principles on hard disk drive SO3.6 Identify symptoms of failure of disk drive SO3.7 Identify errors using troubleshooting methodologies and rectify the faults related to disk drive	LE 3.5 Practice with scan disk, disk cleanup, disk De-fragmentation	3.2 SSD vs HDD 3.4 Formatting, Partitioning and Installation of OS 3.5 Optimizing Hard drive 3.5.1 Disk cleanup 3.5.2 Disk fragmentation 3.5.3 Disk backup 3.6 Preventive maintenance for Hard Drives 3.7 Hard disk and USB drive troubleshooting and maintenance	

SW-3 Suggested Sessional Work (SW) :

- a. Assignments:**
 - i. List and explain the components of hard disk
 - ii. Hard drive, optical drive installation process.
- b. Mini Project:**
 - i. Create a simulator to reproduce physical system errors and fix them
- c. Other Activities (Specify):**
 - i. Formatting, Partitioning and Installation of OS

CO- 4 Apply troubleshooting techniques to rectify display and power supply faults.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Discuss working principles of different types of display devices SO4.2 Define working of video graphics card SO4.3 Apply video troubleshooting techniques SO4.4 Discuss working principles of SMPS SO4.5 Apply troubleshooting techniques to identify	LE4.1 Study the working of different display devices LE4.2 Identification of display device related problem, possible cause and resolution LE4.3 Illustrates the working of SMPS LE 4.4 Identify O/P Voltages, Cable color codes and Connectors in SMPS LE 4.5 Identification of fault finding and troubleshooting in SMPS	Unit 4.0 Display and power supply 4.1 Display 4.1.1 LCD Principles 4.1.2 Plasma Displays 4.1.3 TFT Displays 4.1.4 LED Displays 4.1.5 OLED 4.2 Graphic Cards: 4.2.1 Video capture card 4.3 Video Troubleshooting and Maintenance 4.4 SMPS	4.1 working principles of different display devices 4.2 compare the main categories of display technology 4.3 Familiarization of video graphics card 4.4 Study the working of SMPS

faults in power supply		4.4.1 Block diagram – Basic Principles and Operations 4.4.2 O/P Voltages, Cable color codes and Connectors 4.5 Power Supply Form Factors 4.6 Power Supply Troubleshooting
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SW-4 Suggested Sessional Work (SW) :

- a. Assignments:**
 - i. Discuss and differentiate the various features of LCD and LED monitors
 - ii. Troubleshooting Video Related Issues
- b. Mini Project:**
- c. Other Activities (Specify):**

CO- 5 Apply preventive measures for computer and network maintenance.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO5.1 Apply best practices in computer maintenance SO5.2 Apply measures to prevent computer faults SO5.3 Apply measures to prevent network faults	LE5.1 Installation of hardware device, device drivers LE5.2 Study of best practices on computer maintenance LE5.3 Study of best practices on network maintenance LE 5.4 Configure internet connection to the pc through wire. LE 5.5 Configure internet connection to the pc through wireless technologies. LE 5.6 Share the internet connection (wire and wireless) in the local network and access it from other machine in LAN 5.7 Perform Remote desktop access and control, VoIP	Unit 5.0 Computer and network maintenance 5.1 Preventive measures to ensure a healthy system 5.2 Write best practices to be followed while working with a computer 5.3 System Maintenance and fault prevention 5.4 Steps to configure internet connection to the PC using wireless technology and troubleshoot various connection related problems 5.5 Steps to configure internet connection using L2 and L3 switch. 5.6 Concept of VPN & proxy server.	5.1 Observe system failures while working with computer and rectify 5.2 Concept of resource sharing through network. 5.3 configure internet connection to the pc through wire & troubleshoot the problems

SW-5 Suggested Sessional Work (SW):

- a. **Assignments:**
 - i. List the system faults observed while working with computer system and classify them
 - ii. Troubleshoot wired and wireless networks with appropriate tools
- b. **Mini Project:**
 - i. Not applicable
- c. **Other Activities (Specify):**
 - i. Check and diagnose real-time computer failures and suggest possible rectification

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

Suggested Specification Table (For ESA of Classroom Instruction CI+SW+SL):

Unit Number	Unit Title	Total Marks
I	Computer troubleshooting fundamentals	10
II	Motherboards, Processors, and Memory	15
III	Storage Devices	15
IV	Display and power supply	15
V	Computer and network maintenance	15
Total		70

J) Suggested Specification Table (For ESA of Laboratory Instruction*):

S. No.	Short Laboratory Experiment Title	Total Hours
1	Identify computer hardware and its type	30 Marks are allocated for performance under ESA
2	Illustrate examples of each type of hardware/software fault	
3	Study of anti-virus programs, installing antivirus programs	
4	Study the various components of motherboard	
5	Run diagnostic programs to detect system faults	
6	Identification of motherboard related problems, possible cause and resolution	
7	Identification of processor related problems, possible cause and resolution	
8	List the steps to perform booting process	
9	Identify the BIOS related error messages, beeps codes, possible cause and resolution	
10	Identify of memory related problem, possible cause and resolution	
11	Identification of display device related problem, possible cause and resolution	
12	Disk formatting & logical disk drive creation and device driver installation	

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13	Dismantle and assemble different storage devices	
14	Identify fault, O/P Voltages, Cable color codes and Connectors in SMPS	
15	Perform Remote desktop access and control, VoIP	

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practical's

Note: Only one experiment has to perform at the end semester examination of30.... Marks as per assessment scheme

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture, Tutorial, Case Method, Group Discussion
2. Industrial visits, Industrial Training, Field Trips, Portfolio Based Learning
3. Role Play, Demonstration, ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
4. Brainstorming
5. Others

L) Suggested Learning Resources:

(a) Books :

S. No.	Title	Author	Publisher	Edition & Year
01.	IBM PC and Clones	B. Govindrajalu	Tata Mc-Graw Hill Publications Pvt. Ltd	7th /2000
02.	Troubleshooting, Maintaining & Repairing PC's	Stephen J. Bigelow	Tata Mc-Graw Hill Publications Pvt. Ltd	5 th
03.	PC Upgrading and Maintenance	Bigelow's	Smart Computing, BPB Publications	2nd
04.	The Complete PC Upgrade & Maintenance Guide	Mark Minasi	BPB Publications	10th
05.	Computer Troubleshooting: The Complete Step-by-step Guide to Diagnosing and Fixing Common PC Problems	Kyle McRae, gary Marshall	J H Haynes & Co Ltd	2nd Edition/2008
06.	Troubleshooting and Maintaining Your PC All-in-One for Dummies	Dan Gookin	Learn Made Easy	2nd Edition
07.	Handbook of Computer Troubleshooting	Michael Byrd, Saigh	Global Professional publisher	2001

(b) Open source software and website address:

1. **Computer repair and maintenance** -<http://vkool.com/16-tips-for-computer-repair-and-maintenance/>
2. **Tips for troubleshooting**-<https://www.gcflearnfree.org/computerbasics/basic-troubleshooting-techniques/1/>

3. Common Computer errors - <http://www.learning-about-computers.com/tutorials/troubleshooting.shtml>

4. Backup and restore-<http://www.freecomputermaintenance.com/category/computer-maintenance-tutorials/>

5. PC repair and maintenance- a practical guide-
<https://www.youtube.com/watch?v=I1JxP9aZhjs>

6. Computer maintenance tutorial video-<https://www.youtube.com/watch?v=x9SDcFPDU4o>

(c) Others:

1. PC Troubleshooting and Maintenance Guide PDF-

<http://h10032.www1.hp.com/ctg/Manual/c00772931.pdf>

2. Hong kong polytechnic university PDF on computer maintenance and troubleshooting -

http://cd1.edb.hkedcity.net/cd/tech_edu/handout/Files/Computer_Organization_Day3.pdf

M) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Desktop computer system	Processor i5 10 th gen , 8 GB RAM, 1TB HDD, 512 SSD	LE1.1 to LE5.3
3	Maintenance kit and Preventive maintenance kit	shallow socket, universal joint, extension bars, flexible extension, spinner handle ,hex key wrenches, quick release ratchet handle, sliding T-bar, socket bits slotted & laptop tool kit set, Air blower, vacuum cleaner , heat sink tube, CMOS battery, safety hand gloves	LE1.1 to LE5.3
4	USB PCI Analyzer Diagnostic Card Tester	Motherboard USB PCI Analyzer Diagnostic Card Tester	LE3.2
5	Diagnostic software	Software tools, file recovery software preferably open source based	LE2.2, LE5.2
6	Digital Multimeter	DC Voltage up to 600V (In 5 Ranges) AC Voltage up to 600V (In 2 Ranges) DC Current up to 10A (In 5 Ranges) Resistance up to 2 M.OHMS (In 5 Ranges)	LE1.1 to LE5.3
7	Power supply tester	Power Supply Tester 20 or 24 Pin PSU ATX SATA HDD SMPS PC	LE4.3 to LE4.5
8	Motherboard Diagnostic Card	PC 4-Digit PC Motherboard Diagnostic Card with User Manual	LE2.1-LE2.5
9	Lan Tester	Trace RJ11, RJ45, cables or other metal wire. Check wire continuity.	LE1.1 to LE5.3
10	Connector and cables	RJ 45 connector , CAT-6 cables	LE5.1 to LE5.5

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs) Titles	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)	
	PO-1 Basic and Discipline specific knowledge	PO-2 Problem analysis	PO-3 Design/ development of solutions	PO-4 Engineering Tools, Experimentation and Testing	PO-5 Engineering practices for society, sustainability and environment	PO-6 Project Management	PO-7 Life-long learning	PSO-1	PSO-2
CO-1	2	3	0	2	0	0	2	2	3
CO-2	1	2	1	2	1	0	2	3	3
CO-3	2	2	2	2	1	0	2	3	2
CO-4	2	3	2	2	1	1	2	2	2
CO-5	2	3	1	2	0	1	3	3	3

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O) Course Curriculum Map:

POs & PSOs No.	COs No.& Title	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self-Learning (SL)
PO-1,2,4,7 PSO---1,2	CO-1 Identify fundamental problems in computer troubleshooting	SO1.1 SO1.2 SO1.3	LE1.1 LE1.2 LE1.3	Unit 1.0 Computer troubleshooting fundamentals	As mentioned in relevant page number
PO-2, 4,7 PSO---1,2	CO-2 Apply troubleshooting procedures for finding motherboard, processor and memory faults	SO.2.1, SO.2.2 SO.2.3, SO.2.4 SO.2.5, SO.2.6 SO.2.7, SO.2.8 SO.2.9, O.2.10	LE. 2.1, LE. 2.2 LE. 2.3, LE. 2.4 LE. 2.5, LE. 2.6 LE. 2.7	Unit 2.0 Motherboards, Processors, and Memory	
PO-1,2,4,7 PSO---1,2	CO-3Apply troubleshooting techniques to rectify storages faults	SO.3., SO3.2 SO3.3, SO3.4 SO3.5, SO3.6 SO3.7, SO3.8 SO3.9	LE3.1 LE 3.2 LE3.3 LE3.4	Unit 3.0 Storage Devices	
PO-1,2, 4,7 PSO---1,2	CO-4 Apply troubleshooting techniques to rectify display and power supply faults	SO4.1, SO4.2 SO4.3, SO4.4 SO4.5	LE4.1, LE4.2 LE4.3, LE4.4 LE4.5	Unit 4.0 Display and power supply	
PO-1,2,34,7 PSO---1,2	CO-5 Apply preventive measures for computer maintenance	SO5.1 SO5.2 SO5.3	LE5.1 LE5.2 LE5.3	Unit 5.0 Computer and network maintenance	

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others) , LI : Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

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Semester-VI

- A) Course Code : 2022674(022)
B) Course Title : Mobile Application Development
C) Pre-requisite Course Code and Title : Java Programming
D) Rationale :

Mobile Application development is becoming need of the day. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. 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. Thus this course is an important course for IT students with possibilities of self-employment.

E) Course Outcomes:

- CO-1 Explain framework of Android Application Development.
CO-2 Demonstrate Android activity life cycle.
CO-3 Use of Android User Interface (UI) Layout.
CO-4 Develop applications using menus and dialog boxes of Android.
CO-5 Develop applications using database concept in Android.

F) Scheme of Studies:

Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)				
			L	P	T	Total Study Hours (L+T+P)	Total Credits(C) (L+T+P/2)
Computer Science and Engineering	2022674(022)	Mobile Application Development	2	2	1	5	4

G) Scheme of Assessment:

Board of Study	Course code	Course Title	Scheme of Examination					
			Theory			Practical		Total Marks
			ESE	CT	TA	ESE	TA	
Computer Science and Engineering	2022674(022)	Mobile Application Development	70	30	30	30	50	210

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.
Convert unit of the given physical quantity from one unit system to other.

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CO-1 Explain framework of Android Application Development.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO1.1 Analyze Open source mobile technology SO1.2 Explain android Framework, SDK and Emulation SO1.3 Explain Android Application structure	LI1.1 Install android SDK LI1.2 Install Eclipse IDE LI1.3 Install Android Development Tools LI1.4 Creating & setting up custom Android emulator.	Unit-1.0 Android OS Concepts 1.1 Overview of Android - An Open Platform for Mobile development. 1.2 Android Versions, Codename and API. 1.3 Android applications. 1.4 Features and Marketplaces of Android. 1.5 Android Development Environment setup. 1.6 Android development Framework - Android-SDK, Eclipse Emulators / Android AVD. 1.7 Platform Architecture of Android and component level of Android software stack.	SL1.1 Explain Basics of Application development SL1.2 Awareness of the opportunities in Mobile App development field. SL1.3 History of Android

SW-1 Suggested Sessional Work (SW):

- a. **Assignments:**
 - i. Explain recent trends in mobile Operating System
- b. **Mini Project:**
 - i. Design home grid for your application

CO-2 Demonstrate Android activity life cycle.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Explain Android Activities life cycle. SO2.2 Use Expressions, Manifest, and other necessary UI concept. SO2.3 Explain Different layouts in android.	LI2.1 Design a simple layout. LI2.2 Develop a program based on activity lifecycle.	Unit 2.0 Android Activity & UI Design 2.1 Application components Intent. 2.2 Activity. 2.2.1 Introduction. 2.2.2 Activity Lifecycle. 2.2.3 Activity State Change. 2.3 Broadcast receivers. 2.4 Services and Manifest. 2.5 Create Application and new Activities. 2.6 Expressions and Flow control 2.7 Fundamental Android UI Design 2.8 UI-Layouts and Layout properties 2.8.1 Introducing Layouts 2.8.2 Creating new Layouts 2.8.3 Drawable Resources	SL1.1 Uses of Android drawable resources.

SW-2 Suggested Sessional Work (SW):

- a. **Assignments:**
 - i. Develop a program based on UI interface

b. Mini Project:

- i. Design App icons for your application

CO-3 Use Android User Interface(UI) Layout.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO3.1 List different GUI Objects in android. SO3.2 Explain Layout Design concepts. SO3.3 Explain Android Event driven Programming.	LI3.1 Develop an Event driven program base on Button click. LI3.2 Develop a program on splash screen.	Unit-3.0 Advanced UI Programming 3.1 Introduction to GUI objects. 3.2 Supporting Multiple Screen Activities. 3.3 Application context. 3.4 Intent Web View. 3.5 Event driven Programming in Android (Text Edit, Button clicked etc.) 3.6 Creating a splash screen. 3.7 Introduction to threads in Android	<ul style="list-style-type: none"> • Uses of Threads in Android

SW-3 Suggested Sessional Work (SW):

a. Assignments:

- i. Develop an event driven program based on Text Edit

b. Mini Project:

- i. Animate images in your application

CO-4 Develop applications using menus and dialog boxes of Android.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Demonstrate working of menus SO4.2 Develop application with dialog boxes SO4.3 Explain Adapters and Lists in android	LI4.1 Develop an application based on menu. LI4.2 Develop a program on splash screen.	Unit4.0 Toast, Menu, Dialog, List and Adapters 4.1 Menu: Custom Vs. System Menus 4.2 Creating and Using Handset menu Button (Hardware) 4.3 Android Themes, Dialog, create an Alter Dialog. 4.4 Toast in Android, List & Adapters. 4.5 Android Manifest.xml File. 4.6 Handle Location based services. 4.7 Develop interfaces. 4.8 Create Android Projects based on above tools.	SL1.1 Use of Android Dialog SL1.2 Content of manifest.xml file

SW-4 Suggested Sessional Work (SW):

a. Assignments:

- i. Develop an application based on android themes.

b. Mini Project:

- i. Design an admin panel for your application

CO-5 Develop applications using database concept in Android.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO5.1 Perform Demo Application Launching SO5.2 Perform Database operation	LI5.1 Develop a program on database. LI5.2 Secure android application program.	Unit5.0 Database and Security In Android. 5.1 Understand handling of data in android application. 5.2 Messaging and Networking in android. 5.3 Developing Android Services. 5.4 Learn the concept of Object oriented database. 5.4.1 Database(SQLite DB) 5.4.2 Open and close a database 5.4.3 Creation of .apk files. 5.4.4 File Shared Preferences 5.5 Learn how to secure android applications 5.6 Learn the concept of debugging Methodologies and re-testing process. 5.8 Learn the concept of compliance process/procedures and tests for hosting applications at app stores. 5.9 Learn about the tools used for application functional and security testing. 5.10 Publishing Android application.	SL1.1 Use of google map in android program SL1.2 Understand the fundamentals of Networking

SW-5 Suggested Sessional Work (SW):

a. Assignments:

- i. Develop a program to share file in android

b. Mini Project:

- i. Design a database for your application

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESA of Classroom Instruction):

Unit Number	Unit Title	Total Marks
1	Android OS Concepts	14
2	Android Activity & UI Design	14
3	Advanced UI Programming	14
4	Toast, Menu, Dialog, List and Adapters	14
5	Database and Security In Android	14
Total		70

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J) Suggested Specification Table (For ESA of Laboratory Instruction*):

S. no.	Short Laboratory Experiment Titles	Marks
1	Installation and setup of java development kit(JDK),setup android SDK, setup eclipse IDE, setup android development tools (ADT) plugins, create android virtual device	30 Marks are allocated for performance under ESA
2	Create "Hello World" application. That will display "Hello World" in the middle of the screen using TextView Widget in the red color	
3	Create Registration page to demonstration of Basic widgets available in android.	
4	Create login application where you will have to validate username and passwords Till the username and password is not validated , login button should remain disabled.	
5	Create an application for demonstration of Relative and Table Layout in android.	
6	Create an application for demonstration of Scroll view in android	
7	Create an application for demonstration of Explicitly Starting New Activity using Intent.	
8	Create an application that will pass two number using TextView to the next screen , and on the next screen display sum of that number.	
9	Create spinner with strings taken from resource folder(res >> value folder). On changing spinner value, change background of screen.	
10	Create an application that will get the Text Entered in Edit Text and display that Text using toast (Message).	
11	Create an application that will Demonstrate Button onClick() Event and change the TextView Color based on button Clicked	
12	Create student database and connect with the android UI.	

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practical's.

Note: Only one experiment has to be performed at the end semester examination of **30Marks** as per assessment scheme.

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture, Tutorial, Case Method, Group Discussion
2. Industrial visits, Industrial Training, Field Trips, Portfolio Based Learning
3. Role Play, Demonstration, ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
4. Brainstorming, Others

L) Suggested Learning Resources:

(a) Books :

S. No.	Titles	Author	Publisher	Edition & Year
1.	Android Application Development Black Book	Pradeep Kothari	Dreamtech press	2014
2.	Android Programming for beginners	John Horton	1st Edition,Kindle Edition, Amazon Asia-Pacific Holdings Private Limited	2015
3.	Building Android Apps IN EASY STEPS	Mike McGrath	2nd edition Edition, Kindle Edition, Amazon Asia-Pacific Holdings Private Limited	2012

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S. No.	Titles	Author	Publisher	Edition & Year
4.	Android Programming	Erik Hellman	1st Edition, Kindle Edition, Amazon Asia-Pacific Holdings Private Limited	Latest Edition
5.	Android Programming (Big Nerd Ranch Guide)	Brian Hardy and Bill Phillips	1st Edition, Kindle Edition, Amazon Asia-Pacific Holdings Private Limited	Latest Edition

(b) Open source software and website address:

1. <http://nptel.ac.in/courses/106106147/6>
2. www.android.com
3. www.developer.android.com/tools/help/index.html
4. www.slideshare.net/venturehire/best-android-application-development-tutorials-for-beginner

M) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Computer	Processor i5 with 10 th Gen, 8GB RAM , 256GB SSD or higher	LI1.1-LI5.1
2	Android SDK	Latest version	LI1.1-LI5.1
3	Eclipse/ Android Studio IDE	Latest version	LI1.1-LI5.2

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and teamwork	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2
CO-1 Explain the concept of Open source mobile technology	3	3	1	1	1	1	1	3	2	3	2	2
CO-2 Demonstrate Android activity life cycle.	3	3	2	2	1	1	1	2	2	2	2	2
CO-3 Use of Android UI Layout.	3	3	3	3	2	1	2	3	3	3	2	2
CO4 Develop applications using menus and dialog boxes	3	3	3	3	2	1	1	3	3	3	2	2
CO-5 Develop applications using database concept in android	3	3	2	1	1	1	1	2	2	2	2	2

Legend:1 – Low, 2 – Medium, 3 – High

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O) Course Curriculum Map:

POs & PSOs No.	COs No.& Titles	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO-1,2,3,4,5,6, 7,8,9,10 PSO-1,2	CO-1 Explain the concept of Open source mobile technology	SO1.1 SO1.2 SO1.3	L11.1 L11.2 L11.3	Unit 1.0 Android OS Concepts	SL1.1 SL1.2 SL1.3
PO-1,2,3,4,5,6, 7,8,9,10 PSO-1,2	CO-2 Demonstrate Android activity life cycle.	SO2.1 SO2.2 SO2.3	L12.1 L12.2	Unit 2.0 Android Activity & UI Design	SL2.1
PO-1,2,3,4,5,6, 7,8,9,10 PSO-1,2	CO-3 Use of Android UI Layout.	SO3.1 SO3.2 SO3.3	L13.1 L13.2	Unit 3.0 Advanced UI Programming	SL3.1
PO-1,2,3,4,5,6, 7,8,9,10 PSO-1,2	CO4 Develop applications using menus and dialog boxes	SO4.1 SO4.2 SO4.3	L14.1 L14.2	Unit 4.0 Toast, Menu, Dialog, List and Adapters	SL4.1
PO-1,2,3,4,5,6, 7,8,9,10 PSO-1,2	CO-5 Develop applications using database concept in android	SO5.1 SO5.2	L15.1 L15.2	Unit 5.0 Database and Security In Android.	SL5.1 SL5.2

Legend:CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning.