

# GANPAT UNIVERSITY



## FACULTY OF COMPUTER APPLICATIONS

<b>Programme</b>	Master of Computer Applications	<b>Semester</b>	II
<b>Effective from Academic Year</b>	2020-21	<b>Effective for the batch Admitted in</b>	June 2020

### TEACHING AND EXAMINATION SCHEME – SEM.- II

Subject Code	Subject Name	Teaching scheme												Examination scheme (Marks)					
		Credit						Hours (per week)						Theory			Practical		
		Lecture(DT)			Practical(Lab.)			Lecture(DT)			Practical(Lab.)			CE	SEE	Total	CE	SEE	Total
		L	TU	Total	P	TW	Total	L	TU	Total	P	TW	Total						
P12A1WD	Web Designing	2	1	3	2	-	2	2	1	3	4	-	4	40	60	100	20	30	50
P12A2CN	Computer Networks	2	1	3	-	-	-	2	1	3	-	-	-	40	60	100	-	-	-
P12A3FMA	Fundamental of Mobile	2	1	3	2	-	2	2	1	3	4	-	4	40	60	100	20	30	50

	Applications																		
	Elective-I	2	1	3	2	-	2	2	1	3	4	-	4	40	60	100	20	30	50
	Elective-II	2	1	3	2	-	2	2	1	3	4	-	4	40	60	100	20	30	50
<b>Total</b>		10	5	15	8		8	10	5	15	16		16	200	300	500	80	120	200

**ELECTIVE - I**

- 1) P12A4WAD1 Web Applications Development-I
- 2) P12A4JWT Java Web Technologies

**ELECTIVE - II**

1. P12A5FDS Fundamental of Data Science
2. P12A5IBA Big Data Analytics-I
3. P12A5ICS Cyber Security and Forensic-I
4. P12A5FCC Fundamental of Cloud Computing

**Programme Outcomes(POs):**

<b>PO1:</b>	Apply fundamental knowledge of mathematics, computing science and domain knowledge to provide IT solutions
<b>PO2:</b>	Ability to learn programming, operating system, design, conduct experiments, analyze, process data and interpret results.
<b>PO3:</b>	Design, Develop and evaluate software solutions to meet societal and environmental concerns and process to meet desired needs within realistic constraints.
<b>PO4:</b>	Conduct investigations of complex problems using research based knowledge and methods to provide valid conclusions.
<b>PO5:</b>	The ability to analyze, design, verify, validate, testing, implement, deployment and maintain software systems.
<b>PO6:</b>	Ability to design the system to securely exchange information between inter connecting systems and understand

	professional ethics, cyber regulations and responsibilities.
<b>PO7:</b>	Involve in life-long learning for continual development as an IT professional.
<b>PO8:</b>	Apply and demonstrate computing and management principles to manage projects in multidisciplinary environments by involving in different roles
<b>PO9:</b>	Ability to identify, formulate, and solve engineering problems to optimize the objectives and also comprehend & write effective reports and make quality presentations.
<b>PO10:</b>	Understand the impact of IT solutions on socio-environmental issues and professional and ethical responsibility.
<b>PO11:</b>	Work collaboratively as a member or leader and ability to communicate effectively.
<b>PO12:</b>	Identify potential business opportunities and innovate to create value for the society and seize that opportunity

### **Program Specific Objective (PSO)**

<b>PSO-1</b>	Ability to analyze, design and implement effective software, computing systems with the latest available technologies by applying the basic knowledge of computing science, mathematics and software engineering.
<b>PSO-2</b>	Students will have the ability to test, deploy and analyze the quality of component based systems and to integrate them with the aim to develop a quality software system.
<b>PSO-3</b>	Ability to exhibit knowledge of diverse software engineering practices and project management and can work on interdisciplinary projects as a team leader/team member in developing software of interdisciplinary nature.
<b>PSO-4</b>	Expertise to communicate in oral and written forms and demonstrating the practice of professional ethics.



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Semester	II			Version	1.0.0.0				
Effective from Academic Year			2020-21		Effective for the batch Admitted in			June 2020	
Subject code	P12A1WD		Subject Name		Web Designing				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	2	1	2	-----	5	Theory	40	60	100
Hours	2	1	4	-----	7	Practical	20	30	50
<b>Objectives</b>									
Student can develop responsive website using HTML, CSS, Bootstrap, Javascript, JQuery and Ajax.									
<b>Pre-requisites:</b>									
Basic knowledge of computer fundamentals.									
<b>Course Outcomes :</b>									
Cos	Description								
CO1	Able to design websites using html elements and their attributes.								
CO2	Learn how html elements are to be displayed by defining CSS styles for web pages.								
CO3	Understand Bootstrap framework for developing responsive, mobile-first websites.								
CO4	Experience the client side web development using JavaScript, JQuery and Ajax								

**Mapping of CO and PO:**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	0	2	0	2	2	0	1	0	1
CO2	1	1	2	0	2	0	2	2	0	1	0	1
CO3	1	2	3	1	3	1	2	2	1	1	0	1
CO4	1	2	3	1	3	1	2	2	1	1	0	1

**Theory syllabus**

Unit	Content	Hrs
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**SECTION - I**

1	<p>HTML</p> <p>HTML Introduction, HTML Elements, HTML Attributes, Styles, Formatting, Links, Images, Tables, Lists, Forms, Form Attributes, Form Elements, Input Types, Input Attributes, Media, Video, Audio</p>	6
2	<p>CSS</p> <p>CSS Introduction, CSS Syntax, CSS Selectors, CSS Types, Backgrounds, Borders, Margins, Padding, Height, Width, CSS Box Model, CSS Outline, CSS Text, CSS Fonts, CSS Icons, CSS Links, CSS Lists, CSS Tables, CSS Display, CSS Max-width, CSS Position, CSS Overflow, CSS Float, CSS Inline-block, CSS Align, CSS Opacity, CSS Rounded Corners, CSS Border Images, CSS Backgrounds, CSS Gradients, CSS Shadows, CSS Text Effects, CSS Web Fonts, CSS 2D Transforms, CSS 3D Transforms, CSS Transitions, CSS Animations, CSS Style Images, CSS Box Sizing, CSS Flexbox, Responsive Web Design Introduction, RWD Viewport, RWD Grid View, RWD Media Queries</p>	8
3	<p>Bootstrap</p> <p>Bootstrap Introduction, Containers, Bootstrap Grid, Typography, Colors, Tables, Images, Jumbotron, Alerts, Buttons, Button Groups, Badges, Progress Bars, Spinners, Pagination, List Groups, Cards, Dropdowns, Collapse, Navs, Navbar, Forms, Inputs, Input Groups, Custom Forms, Carousel, Modal, Tooltip, Popover, Toast, Scrollspy, Bootstrap Flex</p>	8

**SECTION - II**

4	<p>JavaScript</p> <p>JavaScript Introduction, &lt;script&gt; Tag, JS Syntax, JS Output, Variables, Operators, Data Types, Functions, Objects, Events, Strings, Numbers, Arrays, Dates, Math, Booleans, Conditions, Switch, For Loop, While Loop, Break and Continue, Type Conversion,</p>	10
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	RegExp, Forms Validations, this Keyword, Let, Const, Arrow Function, Classes, JS JSON	
5	JavaScript HTML DOM DOM Introduction, DOM Methods, DOM Document, DOM Elements, DOM HTML, DOM CSS, DOM Events, DOM Event Listener	6
6	JavaScript AJAX and jQuery AJAX Introduction, AJAX Request, AJAX Response, jQuery Introduction, jQuery Syntax, jQuery Selectors, jQuery Events, jQuery Effects	7

#### Reference Books

1	HTML 5 Developer's Cookbook, By Chuck Hudson, Tom Leadbetter
2	Bootstrap By Jake spurlock ,O'RELLY

#### Web References

1	<a href="https://developer.mozilla.org/en-US/docs/Learn">https://developer.mozilla.org/en-US/docs/Learn</a>
2	<a href="https://www.w3schools.com/">https://www.w3schools.com/</a>
3	<a href="https://getbootstrap.com/">https://getbootstrap.com/</a>
4	<a href="https://jquery.com/">https://jquery.com/</a>
5	<a href="https://jqueryui.com/">https://jqueryui.com/</a>

#### Question Paper Scheme:

##### University Examination Duration: 3 Hours

Note for Examiner: -

(I) Questions 1 and 4 are compulsory with no options.

(II) Internal options should be given in questions 2, 3, 5 and 6.

##### SECTION - I

Q.1 -8 Marks

Q.2 -11 Marks

Q.3 -11 Marks

##### SECTION - II

Q.4 -8 Marks

Q.5 -11 Marks

Q.6 -11 Marks

FACULTY OF COMPUTER APPLICATIONS

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<b>Semester</b>	II			<b>Version</b>	1.0.0.0				
<b>Effective from Academic Year</b>	2020-21			<b>Effective for the batch Admitted in</b>	June 2020				
<b>Subject Code</b>	P12A2CN		<b>Subject Name</b>	Computer Networks					
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>				
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>
	L	TU	P	TW					
Credit	2	1	-	-	3	Theory	40	60	100
Hours	2	1	-	-	3	Practical	-	-	-

**Objective:**

To make aware students aware about network basics, protocols and idea of security

**Pre-requisites:**

Basic Information of Computer Networking and Communication, Unguided and Guided Media of Computer Network

**Course Outcomes :**

<b>Name of CO</b>	<b>Description</b>
<b>CO1</b>	Knowing about Computer Networks, Network Types, Protocol Suite and the basic components of a Network system.
<b>CO2</b>	Knowing and Applying pieces of hardware and software to make networks more efficient, secure and easier to use.
<b>CO3</b>	Differentiating the various types of network configurations, network administration and applying them to meet the changing and challenging networking needs of organizations
<b>CO4</b>	To learn and analyze IPV 4 and IPV 6, protocols of application layer, presentation layer and transport layers, software, and network architectures.

Mapping of CO and PO												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	2	3	2	2	2	2	2	3
CO2	2	2	3	2	2	3	3	2	2	2	2	3
CO3	3	3	2	2	2	3	3	3	3	3	2	3
CO4	2	3	2	3	2	3	2	2	2	2	2	3

**Content:**

Unit		Hrs
<b>SECTION - I</b>		
1	<b>Fundamental of Computer Network</b> Network Types, Work group model VS Domain Model, Network Topologies, Types of Server, VLAN configuration in switch, wired and wireless Networks, OSI Model, TCP / IP Reference models, IEEE standards, Firewall authentication.	11
2	<b>Networking Host Layers:</b> Application Layer: SIP, NNTP, FTP, HTTP, NFS, NTP, SMPP, SMTP, SNMP, Telnet, Presentation Layer: MIME, SSL, TLS, XDR, Session Layer: Sockets, Session establishment in TCP, RTP, PPTP, Transport Layer: UDP, TCP, TCP Connection Establishment and Termination, SCTP and DCCP.	11
3	<b>Networking Media Introduction:</b> Network Layer: IPv4, IPv6, IP Address Classes, Subnet Masks and CIDR Networks	2
<b>SECTION - II</b>		
4	<b>Networking Media Layers:</b> IPsec, ICMP, IGMP, OSPF(Link State), Distance Vector(RIP), Data Link Layer: PPP, SBTV, SLIP, Physical Layer: X.25, wifi, Ethernet, FDDI	4
5	<b>Computer Network Administration:</b> Introduction to server Operating System, Linux Installation, Linux Commands, Linux Directory Structure, Mount and Un-mount devices, DNS, DNS forward lookup zone and reverse lookup zone, Managing User and Group, Introduction to DHCP, DHCP configuration, Group Policy , Logs introduction, log files( Messages, dmesg, Audit log)	9
6	<b>Server Virtualization and Security Authentication</b> Introduction to virtualization, virtualization Architecture, System Backup and recovery, Security Protocols, Security threads, overview of system troubleshooting, Understanding attack techniques, Firewall, mod_evasive, iptables, ssh security, tcpwrappers, SELinux, Wireshark and TCPdump, Server and client administration(LDAP, Kerberos, NIS), Process Management	8

**Reference Books:**



1	TCP/IP Protocol suite B.A. Forouzan
2	Microsoft server 2008: beginner's guide Marty Matthews published by McGraw hill
3	Linux Bible Edition 8 By Christopher Negus and Christine Bresnaham Publication Wiley-India
4	Fedora Bible 2010 Edition: Featuring Fedora Linux 12
<b>Question Paper Scheme:</b>	
	<p><b>University Examination Duration: 3 Hours</b></p> <p>Note for Examiner: -</p> <p>(I) Questions 1 and 4 are compulsory with no options.</p> <p>(II) Internal options should be given in questions 2, 3, 5 and 6.</p> <p><b>SECTION - I</b></p> <p>Q.1 –8 Marks</p> <p>Q.2 –11 Marks</p> <p>Q.3 –11 Marks</p> <p><b>SECTION - II</b></p> <p>Q.4 –8 Marks</p> <p>Q.5 –11 Marks</p> <p>Q.6 –11 Marks</p>

FACULTY OF COMPUTER APPLICATIONS

<b>Programme</b>	Master of Computer Applications				<b>Branch/Spec.</b>	Master of Computer Applications			
<b>Semester</b>	II				<b>Version</b>	1.0.0.0			
<b>Effective from Academic Year</b>			2020-21		<b>Effective for the batch Admitted in</b>			June 2020	
<b>Subject Code</b>	P12A3FMA		<b>Subject Name</b>		Fundamental of Mobile Applications				
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>				
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>
	L	TU	P	TW					
Credit	2	1	2	-	5	Theory	40	60	100
Hours	2	1	4	-	7	Practical	20	30	50

**Objective:**

- ✓ To be able to understand the process of developing software for the mobile application using Android programming.

**Pre-requisites:**

- ✓ How code is built, compiled, and executed, in general terms.
- ✓ Basic knowledge of Object Oriented Programming Concepts.

**Course Outcomes :**

Name of CO	Description
CO1	Employ good software and utilize resources for designing in Android applications.
CO2	Learn about the views and views groups to integrate in Android applications.
CO3	Select pictures, menus and animation to enhance the Android applications.
CO4	Construct programs that demonstrate connect and manage data storage with Android Applications.

Mapping of CO and PO												
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	1	3	2	1	1	1	0	1	0
CO2	1	3	1	0	2	1	0	1	1	1	1	0
CO3	2	2	1	0	1	1	0	1	1	0	0	0
CO4	1	2	2	0	1	2	0	1	1	0	0	1

**Content:**

Unit	SECTION – I	Hrs
1	<p><b>Basics of Android Programming</b>            Basic of Android - Android Versions, Features of Android, Architecture of Android, Android Devices in the Market, Installation of Android Studio, Android Components – Activity; Intents; Service; Broadcast Receiver; Content Provider,            Design &amp; Execute Android App: Creating First Android Application using Activity on Virtual and Physical devices, SDK Manager, AVD Manager – Creation and Deletion of Virtual Devices,            Lice cycle and skeleton - Anatomy of Android Application, Understanding Activities – Life cycle.            Working with Resources – Integer; String; Array; Boolean; Dimension, Colors, Style; Themes,</p>	12
2	<p><b>Working with View and Views Group</b>            User Interface – Using XML; Using Programming.            Display message – Log; Toast; Dialogs – Simple; Positive; Negative; Neutral, Basic Views – Text View; Edit Text; Simple Button; Image Button; Check Box; Toggle Button; Radio Group and Radio Button,            Picker Views – Time Picker View; Date Picker View;            Views Groups – Linear Layout; Table Layout; Relative Layout; Frame Layout; Scroll View.</p>	11
<b>SECTION – II</b>		
3	<p><b>Display Picture, Animation and Menus</b>            Adapters –Base Adapter; Simple Adapter; Array Adapter,            Display Picture –Image View; List View; Gallery View; Grid View            Display Menus – Option menu; Context menu; Popup menu            Animation – Frame by Frame; Tween Animation.</p>	10
4	<p><b>Sharing and Storage</b>            Types of Storage – Internal &amp; External; Shared Preferences; Files; SQLite database; Cloud database            Shared Preferences – Introduction of Shared Preference; Saving and Retrieving Data.</p>	12

	Files – Read, Write and Append the data in/from files SQLite – Introduction; Features; CRUD operation on table Cloud database – Introduction of Fire base; Features; Example	
<b>Practical Content:</b>		
List of programs specified by the subject teacher based on above mentioned topics		
<b>Text Books:</b>		
1	Beginning Android 4 Application Development by Wei – Meng Lee, John Wiley & Sons	
<b>Reference Books:</b>		
1	Professional Android 4 Application Development by Reto Meier, Wrox Publication	
2	Teach Yourself Android Application Development in 24 Hours, 2nd Edition, Sams Publication	
3	Head First Android Development by Dawn Griffiths and David Griffiths, Oreilly Publication	
4	Learn Android Studio by Adam Gerber and Clifton Craig, Apress Publication	
<b>MOOC / Certification Course</b>		
1	<a href="#">Android Basics: User Input by Google</a>	
2	<a href="#">Android Basics: Multiscreen Apps by Google</a>	
3	<a href="#">Android Basics: Networking by Google</a>	
4	<a href="#">Android Basics: Data Storage by Google</a>	
<b>Question Paper Scheme:</b>		
	<p><b>University Examination Duration: 3 Hours</b></p> <p>Note for Examiner: -</p> <p>(I) Questions 1 and 4 are compulsory with no options.</p> <p>(II) Internal options should be given in questions 2, 3, 5 and 6.</p> <p><b>SECTION - I</b></p> <p>Q.1 –8 Marks</p> <p>Q.2 –11 Marks</p> <p>Q.3 –11 Marks</p> <p><b>SECTION - II</b></p> <p>Q.4 –8 Marks</p> <p>Q.5 –11 Marks</p> <p>Q.6 –11 Marks</p>	

**FACULTY OF COMPUTER APPLICATIONS**

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<b>Semester</b>	II				<b>Version</b>	1.0.0.0			
<b>Effective from Academic Year</b>	2020-21				<b>Effective for the batch Admitted in</b>	June 2020			
<b>Subject Code</b>	ELECTIVE – I P12A4WAD1		<b>Subject Name</b>	Web Applications Development-I					
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>				
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>
	L	TU	P	TW					
Credit	2	1	2	-	5	Theory	40	60	100
Hours	2	1	4	-	7	Practical	20	30	50

**Objective:**

- ✓ This course provides a practical hands-on introduction to developing C# language and Web applications using ASP.NET Core MVC.
- ✓ To learn the fundamentals of C# language for developing web, window and app. It's simple, modern, general-purpose, object-oriented programming language and support for software engineering principles.
- ✓ ASP.NET Core MVC is a rich framework for building web apps using the Model-View-Controller design pattern.

**Pre-requisites:**

- ✓ The student should have a basic knowledge of C, C++ and High Level Programming Language concepts.
- ✓ The student should have a good working knowledge of HTML, CSS and Javascript for creating web pages.
- ✓ How code is built, compiled, and executed, in general terms.

**Course Outcomes :**

<b>Name of CO</b>	<b>Description</b>
CO1	Learn about the fundamentals of C# language using Program Control Statements, Arrays, Object Oriented Programming concepts and Language Integrated Query.
CO2	Students will be able to C# language for developing web, window and app.
CO3	Students will be able to examine and Implement all of the new features of MVC and to perform practical hands-on developing web applications using ASP.NET Core MVC.

CO4	Construct programs that demonstrate to Build Entity Framework Code First Data Access Techniques.
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#### Mapping of CO and PO

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	2	2	1	3	2	1	2	1	2
CO2	3	2	2	2	3	1	2	2	2	2	2	3
CO3	3	3	2	1	3	2	3	2	2	2	2	2
CO4	3	3	3	2	3	3	3	3	3	3	3	3

#### TheoryContent :

Unit	Content	Hrs
<b>SECTION - I</b>		
<b>1</b>	<p><b>Core C# Language:</b> Fundamental of Core C#, Installing Visual Studio, The Anatomy of a core C# Program, Declaring variables, Data types, Rules for Identifiers, Enumeration type.</p> <p><b>Console I/O:</b> Reading Console Input, Writing Console Output, Using ReadKey ().</p> <p><b>Program Control Statements:</b> Conditional Statements (if, switch), Looping Statements (for, while, do-while, foreach), Jump Statements (break, continue, goto, return).</p> <p><b>Understanding Arrays and Strings:</b> One Dimensional Arrays, Multi-Dimensional Arrays, Jagged Array, Using Strings.</p> <p><b>OOP's Concepts:</b> Define Classes and Objects, Methods, Access Modifiers, Constructor, Destructor, Inheritance, Polymorphism (Overloading and Overriding), Collections ( ArrayList and Hashtable), Exception Handling.</p> <p><b>Language Integrated Query:</b> Introduction to LINQ, LINQ Query Syntax, LINQ Query Operators, LINQ Query Methods.</p>	14
<b>2</b>	<p><b>Introduction ASP.NET Core MVC :</b> Understand the History of ASP.NET Core MVC, Key Benefits of ASP.NET Core MVC, Understand MVC Architecture or Pattern, Creating a New ASP.NET Core MVC Project: Adding the Controller, Understanding Routes, Rendering Web Pages: (Creating and Rendering a View, Adding Dynamic Output), Understanding MVC Conventions, Build a Project, Debugging and Running an applications.</p>	10
<b>SECTION - II</b>		
<b>3</b>	<p><b>Introduction to View, Controller and Model:</b> <b>The View:</b> The Purpose of views, ViewData, ViewBag and TempData, Strongly typed view, Adding View, Working with HTML and Tag Helpers, Layout.</p>	11

	<p><b>The Razor View Engines:</b> Introduction Razor View Engines, Razor Syntax: Implicit Razor expressions, Explicit Razor expressions, Expression encoding, Razor code blocks, Implicit transitions, Explicit delimited transition, Explicit line transition, Control structures: Conditionals : if, else if, and switch; Looping : for, foreach, while, and do while; Comments, functions,</p> <p><b>Controller:</b> The Purpose of Controller, Creating New Controllers, Write Action Methods, Parameters in Controller Actions, types of Action Results &amp; Return Type.</p> <p><b>Model :</b> Understanding Model, Creating the Model, Model Binding, Understanding the Need for Model Validation.</p> <p><b>URL Routing :</b> Introducing URL Patterns, Defining Default Values, Using Static URL Segments, Attribute Routes;</p>	
4	<p><b>Creating a web applications using ASP.NET Core MVC:</b></p> <p>Create a web app with Core MVC, Add a controller, Add a view, Add a model, Work with SQL Server Local DB, Controller methods and views, Add search, Add a new field, Add validation, Examine the Details and Delete methods.</p> <p><b>ASP.NET Core MVC using Entity Framework:</b></p> <p>Get started, Create, Read, Update, and Delete operations, Sorting record, filtering record, paging and grouping.</p>	10
<b>Practical Content:</b>		
List of programs specified by the subject teacher based on above mentioned topics.		
<b>Reference Books:</b>		
1	Professional C# 7 and .NET Core 2.0 by Christian Nagel, Wrox publication	
2	Pro C# 7: With .NET and .NET Core by Andrew Troelsen, Philip Japikse, Apress Publication	
3	The Complete Reference C# 4.0, Herbert Schildt, Tata McGraw Hill Edition	
4	Pro ASP.NET Core MVC Sixth Edition by Adam Freeman, Apress Publication	
5	Professional C# 7 and .NET Core 2.0 by Christian Nagel, Wrox publication	
6	ASP.NET Core 2.0 MVC and Razor Pages for Beginners	
7	Pro Entity Framework Core 2 for ASP.NET Core MVC, Adam Freeman, Apress	
<b>Web Reference:</b>		
1	<a href="https://docs.microsoft.com/en-us/aspnet/core/mvc/overview?view=aspnetcore-5.0">https://docs.microsoft.com/en-us/aspnet/core/mvc/overview?view=aspnetcore-5.0</a>	
2	<a href="https://docs.microsoft.com/en-us/aspnet/core/data/entity-framework-6?view=aspnetcore-5.0">https://docs.microsoft.com/en-us/aspnet/core/data/entity-framework-6?view=aspnetcore-5.0</a>	
3	<a href="https://asp.mvc-tutorial.com/introduction/what-is-mvc/">https://asp.mvc-tutorial.com/introduction/what-is-mvc/</a>	
4	<a href="https://www.tutorialspoint.com/asp.net_core/asp.net_core_setup_mvc.htm">https://www.tutorialspoint.com/asp.net_core/asp.net_core_setup_mvc.htm</a>	
5	<a href="https://www.pragimtech.com/courses/asp-net-core-mvc-tutorial-for-beginners/">https://www.pragimtech.com/courses/asp-net-core-mvc-tutorial-for-beginners/</a>	
<b>MOOC/Certification Course</b>		
1	Microsoft Course 20486-D: Developing ASP.NET Core MVC Web Applications	
2	Microsoft Exam 70-486: Developing ASP.NET MVC Web Applications	
3	Udemy Online Course ASP.NET MVC Courses	

**Question Paper Scheme:****University Examination Duration: 3 Hours**

Note for Examiner: -

(I) Questions 1 and 4 are compulsory with no options.

(II) Internal options should be given in questions 2, 3, 5 and 6.

**SECTION - I**

Q.1 -8 Marks

Q.2 -11 Marks

Q.3 -11 Marks

**SECTION - II**

Q.4 -8 Marks

Q.5 -11 Marks

Q.6 -11 Marks



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<b>Effective from Academic Year</b>			2020-21		<b>Effective for the batch Admitted in</b>			June 2020				
<b>Subject Code</b>	ELECTIVE – I P12A4JWT		<b>Subject Name</b>		Java Web Technologies							
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>							
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>			
	L	TU	P	TW								
Credit	2	1	2	-	5	Theory	40	60	100			
Hours	2	1	4	-	7	Practical	20	30	50			
<b>Objective:</b>												
To make students aware about different java technologies which are used in developing websites												
<b>Pre-requisites:</b>												
Students should be familiar with core, object oriented java language.												
<b>Course Outcomes :</b>												
<b>Name of CO</b>		<b>Description</b>										
CO1		Develop web applications using Servlet and JSP.										
CO2		Develop web applications using MVC Framework like JSF.										
CO3		Apply concepts of session handling and java bean scopes.										
CO4		Perform database CRUD operations using JDBC.										
<b>Mapping of CO and PO</b>												
<b>COs</b>	<b>Programme Outcomes(POs)</b>											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>CO1</b>	2	2	2	1	3	2	1	2	1	1	0	1
<b>CO2</b>	2	2	2	1	3	2	1	2	1	1	0	1
<b>CO3</b>	2	2	2	1	3	2	1	2	1	1	0	1
<b>CO4</b>	2	2	2	1	3	2	1	2	1	1	0	1
<b>TheoryContent :</b>												

Unit	Content	Hrs
	<b>SECTION – I</b>	
<b>1</b>	<p><b>Regular Expression in Java</b> Introduction to <u>Common matching symbols</u>, Introduction to <u>Meta characters</u>, Introduction to <u>Quantifiers</u>, Introduction to <u>Capturing Groups</u></p> <p><b>Java Annotations</b> Introduction to Java Custom Annotation, Introduction to Meta annotations in java, Introduction to Built-in annotations in Java, Java Annotations Example</p> <p><b>Using JDBC to Work With Databases</b> Driver Types; Configuring ODBC Data Source; Connecting to a Database; Returning a Result Set; Moving Cursor Through a Result Set; Returning Data From a Result Set; Modifying Data</p>	12
<b>2</b>	<p><b>Servlet Lifecycle</b> Basic Servlet Structure, service method, doGet method, doPost method, init method, destroy method</p> <p><b>Servlets for Handling Request &amp; Response</b> Reading Form Data from Servlets, Redirections, Building Excel Spreadsheets</p> <p><b>Servlets for Session Tracking</b> Sending Cookies, Receiving Cookies, Session Cookies, Persistent Cookies, Hidden Form Field, URL Rewriting, Session Tracking API</p> <p><b>JSP</b> Expression tag, Script let tag, Declaration tag, Predefined (implicit) Objects, Directive Elements (page, include , tag lib), Exception handling in jsp, Action Elements (forward, include, use Bean), Introduction to Expression language, Using MVC in jsp</p>	11
	<b>SECTION – II</b>	
<b>3</b>	<p><b>JavaBeans and JDBC in JSP and Servlets</b> Creating and using java beans, MVC with Request Dispatcher, JDBC Examples using Prepared Statements in Servlets and JSP</p> <p><b>Introducing JSF</b> A Simple Example, JSF Framework Services</p> <p><b>Navigation and Managed Beans Concepts in JSF</b> Message Bundles, Bean Scopes, Static Navigation, Dynamic Navigation, Redirection</p> <p><b>Standard JSF Tags</b> Panels, Text Fields and Text Areas, Buttons and Links, At least six Selection Tags, Displaying Messages</p>	11
<b>4</b>	<p><b>Data Tables in JSF</b> Displaying a Simple Table, Setting Headers, Footers, and Captions, Using Styles, How to edit Tables, Database Tables in JSF, Scrolling Techniques in data tables</p>	11

	<p><b>Conversion and Validation Process in JSF</b>  Overview of the Conversion and Validation Process, Using Standard Converters , Using Standard Validators, Creating Custom Converters, Creating Custom Validators</p> <p><b>Event Handling and JDBC in JSF</b>  Events and the JSF Life Cycle, Example of Event handling in JSF, Immediate Components Basic Database Operations like Insert, Update, Delete, Selectin JSF Applications</p>	
<b>Practical Content:</b>		
List of programs specified by the subject teacher based on above mentioned topics.		
<b>Reference Books:</b>		
1	Core Servlets and Javasever Pages Volume1 and 2, By Marty Hall and Larry Brown, PEARSON Education	
2	Core Java Server Faces By David Geary and Cay Horst Mann, PEARSON Education	
<b>Web Reference:</b>		
1	<a href="https://docs.oracle.com/javase/tutorial/">https://docs.oracle.com/javase/tutorial/</a>	
2	<a href="https://www.javatpoint.com/java-tutorial">https://www.javatpoint.com/java-tutorial</a>	
<b>Question Paper Scheme:</b>		
	<p><b>University Examination Duration: 3 Hours</b>  Note for Examiner: -  (I) Questions 1 and 4 are compulsory with no options.  (II) Internal options should be given in questions 2, 3, 5 and 6.</p> <p><b>SECTION - I</b>  Q.1 -8 Marks  Q.2 -11 Marks  Q.3 -11 Marks</p> <p><b>SECTION - II</b>  Q.4 -8 Marks  Q.5 -11 Marks  Q.6 -11 Marks</p>	

**FACULTY OF COMPUTER APPLICATIONS**

<b>Programme</b>	Master of Computer Applications				<b>Branch/Spe c.</b>	Master of Computer Applications			
<b>Semester</b>	II				<b>Version</b>	1.0.0.0			
<b>Effective from Academic Year</b>			2020-21		<b>Effective for the batch Admitted in</b>			June 2020	
<b>Subject Code</b>	ELECTIVE – II P12A5FDS		<b>Subject Name</b>		Fundamental Of Data Science				
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>				
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>
	L	TU	P	TW					
Credit	2	1	2	-	5	Theory	40	60	100
Hours	2	1	4	-	7	Practical	20	30	50

**Objective:**

To familiarize students with the basic statistical methods and tools.  
 To understand data visualization methods and tools used.  
 To summarize and analyze quantitative information for decision making

**Pre-requisites:**

Basic Knowledge of Mathematics

**Course Outcomes:**

Name of CO	Description
CO1	To understand data types such as cross-sectional data, time series data and panel data.
CO2	To understand uncertainty and how probability concepts are used for measuring and modelling uncertainty.
CO3	To Understand the students how machine learning is useful in solving real world problems.
CO4	To Understand how to build and evaluate Models for different classification problems.
CO5	To learn various data visualization techniques for making Decision.

<b>Mapping of CO and PO</b>											
Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	0	1	1	1	0	0	0
CO2	3	1	2	2	1	2	2	2	0	0	1
CO3	2	3	3	3	2	3	3	3	0	1	2
CO4	2	3	3	3	2	3	3	3	0	1	2
CO5	1	3	2	2	2	3	2	2	0	0	1

**Content:**

Unit	<b>SECTION – I</b>	Hrs
1	<p><b>Basics of Statistics</b></p> <p>Data Types, Structured and unstructured data, Cross-sectional data, time series data and Panel data, Types of Data Measurement scale, Nominal scale, Ordinal Scale, Interval Scale and Ratio Scale. Measures of Central Tendency; Mean value, Median Value, Mode. Percentile, Decile and Quartile. Measures of Variation; Range, Inter-Quartile Distance, Variance, Standard Deviation. Data visualization in python: Histogram, Bar Chart, Pie Chart, Scatter Plot, Coxcomb Chart, Box and Whisker Plot.</p>	12
2	<p><b>Introduction to Probability Theory</b></p> <p>Probability theory terminology, Random experiment, Sample Space, Event, Probability Estimation, using relative frequency, Joint probability, Marginal Probability, independent events, Conditional probability. Application of simple probability rules- Association Rule learning. Bayes’ theorem, Solving Monty Hall Problem using Bayes’ Theorem. Probability distributions (Normal Distribution, Binomial Distribution and Poison Distribution).</p>	11
<b>SECTION – II</b>		
3	<p><b>Introduction to Machine Learning</b></p> <p>Introduction to Analytics and Machine Learning, Why Machine Learning? Framework for developing Machine Learning Models, Python Stack for Data Science, Applications of Machine learning, Classification of Machine Learning algorithms, Supervised learning, Unsupervised learning, Reinforced learning and Evolutionary learning, Python libraries suitable for Machine Learning, Supervised Learning Algorithms with applications in Predictive Analytics, Correlation Analysis, Pearson Correlation Coefficient, Spearman Rank Correlation, Point Bi-Serial Correlation, The Phi-coefficient. Building a Simple Regression Model, Model Diagnostics, Making prediction and Measuring Accuracy, Developing multiple linear regression model using Python, Making prediction on the Validation Set, Performance measures, Confusion matrix, accuracy, Error rate, Type-I error,</p>	12

	Type-2 error, Sensitivity, Specificity, Precision, ROC curve and AUC.	
4	<p><b>Introduction to Decision Trees</b></p> <p>Classification and Regression Tree, Cost Based Splitting Criteria, Decision tree learning, Splitting the dataset, Building Decision Tree Classifier using Gini Criteria, Measuring Test Accuracy, Displaying the tree, Understanding Gini Impurity, Building Decision Tree using Entropy criteria, Finding Optimal criteria and Max depth, Benefits of Decision Tree.</p>	10
<b>Practical Content:</b>		
List of programs specified by the subject teacher based on above mentioned topics		
<b>Reference Books:</b>		
1	Kumar, U. D. (2017). Business Analytics: The Science of Data-driven Decision Making. Wiley India.	
2	Sancheti, D. C., & Kapoor, V. K. (2007). Statistics: Theory. Methods and Applications, Sultan Chand & Sons, New Delhi.	
3	Knaflic, C. N. (2015). Storytelling with data: A data visualization guide for business professionals. John Wiley & Sons.	
4	Gupta, S.P., "Statistical Methods," Sultan Chand & Sons, 2004	
5	Business Statistics by J. K. Sharma	
<b>Web Reference:</b>		
1	<a href="https://www.youtube.com/watch?v=RM8T1eYBjQY">https://www.youtube.com/watch?v=RM8T1eYBjQY</a>	
2	<a href="https://www.edx.org/learn/statistics">https://www.edx.org/learn/statistics</a>	
<b>Question Paper Scheme:</b>		
	<p><b>University Examination Duration: 3 Hours</b></p> <p>Note for Examiner: -</p> <p>(I) Questions 1 and 4 are compulsory with no options.</p> <p>(II) Internal options should be given in questions 2, 3, 5 and 6.</p> <p><b>SECTION - I</b></p> <p>Q.1 –8 Marks</p> <p>Q.2 –11 Marks</p> <p>Q.3 –11 Marks</p> <p><b>SECTION - II</b></p> <p>Q.4 –8 Marks</p> <p>Q.5 –11 Marks</p> <p>Q.6 –11 Marks</p>	

**FACULTY OF COMPUTER APPLICATIONS**

<b>Programme</b>	Master of Computer Applications				<b>Branch/Spe c.</b>	Master of Computer Applications			
<b>Semester</b>	II				<b>Version</b>	1.0.0.0			
<b>Effective from Academic Year</b>				2020-21	<b>Effective for the batch Admitted in</b>				June 2020
<b>Subject Code</b>	ELECTIVE – II P12A5IBA			<b>Subject Name</b>	Big Data Analytics-I				
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>				
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>
	L	TU	P	TW					
Credit	2	1	2	-	5	Theory	40	60	100
Hours	2	1	4	-	7	Practical	20	30	50
<b>Objective:</b>									
To learn the Injecting data into Hadoop also build and maintain reliable, scalable, distributed systems with Hadoop. Understand the Big Data Platform and its Use cases. This course provides an overview of Apache Hadoop, HDFS Concepts and Interfacing with HDFS, Understand Map Reduce Jobs. To understand Apache Hadoop architecture and knowledge on a variety of databases and how to work in databases. To apply analytics on Structured, Unstructured Data.									
<b>Pre-requisites:</b>									
<ul style="list-style-type: none"> <li>✓ The student should have a basic knowledge of Object Oriented programming and High Level Programming Language concepts.</li> <li>✓ Basic knowledge of SQL (RDBMS) and Linux operating system flavours.</li> <li>✓ How code is built, compiled, and executed, in general terms.</li> </ul>									
<b>Course Outcomes :</b>									
<b>Name of CO</b>	<b>Description</b>								
CO1	Understanding about big data application development technology.								
CO2	Students will be able to operate Ubuntu (Linux) Operating system and It's command and will be able to build and maintain reliable, scalable, distributed systems with Apache Hadoop.								
CO3	Students will learn HDFS Architecture and It's core components.								
CO4	Students will be able to Construct programs that demonstrate the Map-Reduce based Applications.								

Mapping of CO and PO												
Cos	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	2	2	0	2	2	1	2	1	3
CO2	2	2	3	2	3	0	3	3	2	2	2	3
CO3	3	3	2	3	3	0	3	3	3	3	2	3
CO4	3	3	3	3	3	0	2	2	2	2	2	3
<b>TheoryContent :</b>												
Unit	Content											Hrs
<b>SECTION – I</b>												
<b>1</b>	<p><b>Introduction to BigData:</b> Introduction to BigData and its importance, Evolution of Big Data, Concepts and Terminology : Datasets, Data Analysis, Data Analytics, Descriptive Analytics, Diagnostic Analytics, Predictive Analytics, Prescriptive Analytics, Business Intelligence (BI), Key Performance Indicators (KPI), Big Data Characteristics : Volume, Velocity, Variety, Veracity, Value, Different Types of Digital Data : Structured Data, Semi-Structured data, Unstructured Data, Difference between Structured, Semi-structured and Unstructured data, Big Data Architecture, Technology Trends in the Market.</p>											11
<b>2</b>	<p><b>Big Data Analysis Techniques :</b> Big Data Analysis Techniques: Quantitative analysis, Qualitative analysis, Data mining, Statistical analysis, Machine learning, Semantic analysis, Visual analysis, Case studies</p> <p><b>Introduction to Ubuntu (Linux) :</b> Ubuntu Operating System Installation, Start working with basic and advance Unix command, Working with Directories command, Different option to create File and File Permissions, working with Listing files and folders command, Other Useful Unix Commands.</p> <p><b>Introduction to HADOOP:</b> Introduction to Hadoop and its Features, The Hadoop Ecosystem, Hadoop core components of the Hadoop Ecosystem, Different Hadoop Distributions, Different types of Hadoop Vendors, Hadoop Installation, Basic Hadoop Command, and Developing Enterprise Applications with Hadoop.</p>											11
<b>SECTION – II</b>												
<b>3</b>	<p><b>Big Data Storage – HDFS :</b> Introduction HDFS (Hadoop Distributed File System), HDFS Architecture and Features, HDFS core components: NameNode and DataNode, Blocks storage,</p>											11



	Data Replication and Rack Awareness, Using HDFS Files, Hadoop-Specific File Types, Managing HDFS from Command Line, Anatomy of File Read and Write on HDFS, Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce, Data Serialization.	
4	<p><b>Big Data Analytics :Map Reduce</b></p> <p><b>Map Reduce:</b> Introduction Map Reduce, The fundamentals: map() and reduce(), Characteristics of MapReduce, Real-time Uses of MapReduce, Data Locality.</p> <p><b>Map Reduce work Process:</b> Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution.</p> <p><b>Hadoop Yarn:</b> Introduction to Yarn, Hadoop Yarn Architecture, Introduction to Hadoop Yarn Resource Manager, Node Manager</p>	12
<b>Practical Content:</b>		
List of programs specified by the subject teacher based on above mentioned topics.		
<b>Reference Books:</b>		
1	Thomas Erl ,”Big Data Fundamentals-Concepts, Drivers and Techniques”, Pearson publication,2016	
2	Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”,Wiley, ISBN: 9788126551071, 2015	
3	Seema Acharya, SubhashiniChellappan, “ Big Data and Analytics”, Wiley India Pvt. Ltd.,2015	
4	Tom White,“Hadoop: The Definitive Guide”,O'Reilly Media,4th Edition,2015	
5	VigneshPrajapati,“Big Data Analytics With R and Hadoop”, Packt Pub Ltd ,2013	
<b>Web Reference:</b>		
1	<a href="http://www.bigdatauniversity.com">http://www.bigdatauniversity.com</a>	
2	<a href="http://hadoop.apache.org/">http://hadoop.apache.org/</a>	
<b>MOOC/Certification Course</b>		
1	Associate Big Data Analyst	
2	Big Data Hadoop Certification	
3	Big Data Hadoop Administrator Certification	
4	Intellipaath Big Data Hadoop Certification	
5	Hortonworks Hadoop Certification	
<b>Question Paper Scheme:</b>		
	<p><b>University Examination Duration: 3 Hours</b></p> <p>Note for Examiner: -</p> <p>(I) Questions 1 and 4 are compulsory with no options.</p> <p>(II) Internal options should be given in questions 2, 3, 5 and 6.</p> <p><b>SECTION - I</b></p> <p>Q.1 –8 Marks</p> <p>Q.2 –11 Marks</p> <p>Q.3 –11 Marks</p> <p><b>SECTION - II</b></p> <p>Q.4 –8 Marks</p> <p>Q.5 –11 Marks</p> <p>Q.6 –11 Marks</p>	

**FACULTY OF COMPUTER APPLICATIONS**

<b>Programme</b>	Master of Computer Applications				<b>Branch/Spe c.</b>	Master of Computer Applications						
<b>Semester</b>	II				<b>Version</b>	1.0.0.0						
<b>Effective from Academic Year</b>				2020-21	<b>Effective for the batch Admitted in</b>						June 2020	
<b>Subject Code</b>	ELECTIVE – IIP12A5ICS			<b>Subject Name</b>	Cyber Security and Forensic-I							
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>							
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CE</b>	<b>SEE</b>	<b>Total</b>			
	L	TU	P	TW								
Credit	2	1	2	-	5	Theory	40	60	100			
Hours	2	1	4	-	7	Practical	20	30	50			
<b>Objective:</b>												
To be aware of cyber security in the context of injection attacks.												
<b>Pre-requisites:</b>												
Basic Knowledge of web application, Database and SQL is essential, Hands of experience of Linux OS.												
<b>Course Outcomes :</b>												
<b>Mapping of CO and PO</b>												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	1	1	2	1	0	0	2	0	1
CO2	1	2	2	2	1	2	1	0	0	2	0	1
CO3	1	2	2	1	0	2	1	0	0	2	0	1
CO4	1	2	2	2	0	2	1	1	1	2	0	1
<b>Name of CO</b>	<b>Description</b>											
<b>CO1</b>	Able to learn detect vulnerability and secure website.											
<b>CO2</b>	Understand various website Attacks and countermeasures against various input injection attacks.											
<b>CO3</b>	Able to learn various vulnerability scanner.											

<b>CO4</b>	Learn and use Exploitation Framework like Metasploit, BeEFetc	
<b>Content:</b>		
Unit		Hrs
<b>SECTION - I</b>		
<b>1</b>	<p><b>Hacking Web Apps and Profiling.</b>  Web Application Hacking: GUI web Hacking, URI Hacking, Methods Headers and Body, Resources. The Web Client and HTML, Other Protocols, How &amp; Why Web Apps attack.</p> <p><b>Infrastructure Profiling:</b> Foot printing and Scanning, Basic Banner Grabbing, Advanced HTTP Fingerprinting, Infrastructure Intermediaries.</p>	8
<b>2</b>	<p><b>Application Profiling:</b> Manual Inspection, Search Tools for Profiling, Automated Web Crawling, General Countermeasures.</p> <p><b>Bypassing and Attacking Web Authentication</b></p> <p><b>Web Authentication Threats:</b> Username/password Threats, Password Guessing and its Countermeasures, Eavesdropping attacks and its Countermeasures, Forms-based Authentication attacks and its countermeasures. Stronger web Authentication, Web Authentication Services.</p> <p><b>Bypassing Authentication:</b> Token Replay, Cross-site Request Forgery, Identity Management.</p>	9
<b>3</b>	<p><b>Penetration Testing and Input Injection Attacks.</b>  Where to find Attack vectors, Common Input Injection Attacks: Buffer Overflow, Canonicalization and its countermeasures, Advanced Directory Traversal, Navigating Without Directory Listing, HTML Injection: XSS, Embedded scripts, Cookies and Predefined Headers, Counter countermeasures. <b>SQL Injection:</b> SUB Queries, UNION, SqlInjection countermeasures, XPATH Injection and its countermeasures, LDAP Injection.</p>	8
<b>SECTION - II</b>		
<b>4</b>	<p><b>Basics of Penetration Testing:</b> The Phase of PTES, Types of Penetration Tests.</p> <p><b>Metasploit Basics:</b> Introduction, Terminology, Metasploit Interfaces, Metasploit Utilities.</p> <p><b>Intelligence Gathering:</b> Passive Information Gathering, Active Information Gathering, Target Scanning</p>	8
<b>5</b>	<p><b>Vulnerability Scanning:</b> Basic Vulnerability Scan, Scanning with scanning tools, Using Scan Results for Autopwning.</p>	5
<b>6</b>	<p><b>Attacking Users</b>  Defacing Content, Capturing User Input: Using Focus Event, Using Keyboard Events, Using Mouse and Pointer Events, Using Form Events, Social Engineering: Using TabNabbing, Abusing UI Expectations: Using Fake Login Prompts, Pretty Theft, Gmail Phishing.</p>	9
<b>Practical Content:</b>		

List of programs specified by the subject teacher based on above mentioned topics

**Reference Books:**

1	Hacking Exposed Web Application, 3 <sup>rd</sup> Edition by Joel Scambray, Vincent Liu, Caleb Sima
2	The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws by Dafydd Stuttard and Marcus Pinto Wiley Publication
3	Metasploit - The Penetration Tester's Guide by David Kennedy , Jim O'gorman , Devon Kearns and MatiAharoni – No Starch Press Publication
4	The Browser Hacker's Handbook by Wade Alcorn, Christian Fricot and Michele Orru – Wiley Publication
5	Web Penetration Testing with Kali Linux by Joseph Muniz, AamirLakhan – Packt Publication

**Question Paper Scheme:**

**University Examination Duration: 3 Hours**

Note for Examiner: -

(I) Questions 1 and 4 are compulsory with no options.

(II) Internal options should be given in questions 2, 3, 5 and 6.

**SECTION - I**

Q.1 –8 Marks

Q.2 –11 Marks

Q.3 –11 Marks

**SECTION - II**

Q.4 –8 Marks

Q.5 –11 Marks

Q.6 –11 Marks

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications			Branch/ Spec.	Master of Computer Applications				
Semester	II			Version	1.0.0.0				
Effective from Academic Year			2020-21	Effective for the batch Admitted in			June 2020		
Subject code	ELECTIVE – II P12A5FCC		Subject Name	Fundamental Of Cloud Computing					
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2	1	2	----- -	5	Theory	40	60	100
Hours	2	1	4	----- -	7	Practical	20	30	50

Objectives

Students can understand and hand on the fundamental concepts of cloud computing such as architecture of cloud computing, cloud deployment models, cloud service models with case study.

Pre-requisites:

Operating System Concepts, Computer Network Concepts, Basic Programming concepts

Course Outcomes:

COs	Description
CO1	Understand computing paradigms and cloud computing basics
CO2	Learn Cloud Computing – Architecture and Infrastructure
CO3	Understand Cloud Deployment Models
CO4	Learn Cloud Service Models: IaaS, PaaS, SaaS with Case Study

**Mapping of CO and PO:**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1	2	2	2	2	1	2	2	2	2
CO2	1	2	1	1	1	1	1	1	1	1	1	1
CO3	2	2	3	1	2	2	2	2	2	2	2	2
CO4	3	3	3	3	3	2	3	2	3	3	2	3

**Theory syllabus**

Unit	Content	Hrs
<b>SECTION – I</b>		
1	<b>Computing Paradigms</b> Distributed Computing, Peer-to-Peer Computing, Cluster Computing, Utility Computing, Grid Computing, Cloud Computing	5
2	<b>Cloud Computing Basics</b> Cloud Computing – Introduction: Features and Applications, Challenges and Issues, Characteristics of Cloud Computing Cloud Computing – Planning: Strategy Phase, Planning Phase, Deployment Phase.	6
3	<b>Cloud Computing – Architecture and Infrastructure</b> Cloud Computing – Architecture: Front End, Back End Cloud Computing – Infrastructure: Hypervisor, Management Software, Deployment Software, Network, Server, Storage Cloud Computing - Infrastructural Constraints: Transparency, Scalability,	5

	Intelligent Monitoring, Security	
4	<b>Cloud Deployment Models</b> Public Cloud Model, Private Cloud Model, Hybrid Cloud Model, Community Cloud Model	6
<b>SECTION – II</b>		
5	<b>Cloud Service Models: IaaS, PaaS, SaaS</b> <b>Infrastructure as a Service (IaaS):</b> Introduction to Infrastructure, Virtual machines, Virtualization, Hypervisors, Server virtualization, Resource provisioning, Scaling, Implementation of IAAS, Applications, Issues and Challenges, Dockers and containers	5
6	<b>Platform as a Service (PaaS):</b> Introduction to various platforms, Characteristics, PaaS architecture, Containers, Application staging, Implementation of PaaS, Issues, Application Development and Deployment using PaaS.	5
7	<b>Software as a Service (SaaS):</b> Introduction to services, web services, APIs, Service management, Implementation of SaaS, Characteristics, Applications and Issues.  Introduction, Web services, Web 2.0, Web OS, Examples, How to implement SAAS	5
8	<b>Case study</b> Distributed File System, HDFS, and Cloud Implementation using Open Stack.	8
Reference Books		
1	Barrie Sosinsky: "Cloud Computing Bible", Wiley-India, 2010	
2	RajkumarBuyya, James Broberg, Andrzej M. Goscinski: "Cloud Computing: Principles and Paradigms", Wiley, 2011	
3	Nikos Antonopoulos, Lee Gillam: "Cloud Computing: Principles, Systems and Applications", Springer, 2012	
Web References		
1	<a href="https://www.tutorialspoint.com/cloud_computing/">https://www.tutorialspoint.com/cloud_computing/</a>	
2	<a href="https://www.javatpoint.com/cloud-computing-tutorial">https://www.javatpoint.com/cloud-computing-tutorial</a>	

3	<a href="https://www.w3schools.in/cloud-computing/">https://www.w3schools.in/cloud-computing/</a>
4	<a href="https://www.tutorialride.com/cloud-computing/cloud-computing-tutorial.htm">https://www.tutorialride.com/cloud-computing/cloud-computing-tutorial.htm</a>
<b>Question Paper Scheme:</b>	
<p><b>University Examination Duration: 3 Hours</b></p> <p>Note for Examiner: -</p> <p>(I) Questions 1 and 4 are compulsory with no options.</p> <p>(II) Internal options should be given in questions 2, 3, 5 and 6.</p> <p><b>SECTION - I</b></p> <p>Q.1 -8 Marks</p> <p>Q.2 -11 Marks</p> <p>Q.3 -11 Marks</p> <p><b>SECTION - II</b></p> <p>Q.4 -8 Marks</p> <p>Q.5 -11 Marks</p> <p>Q.6 -11 Marks</p>	



