All other PG / UG / B.Voc / Diploma / Certificate Courses

CURRICULUM FRAMEWORK AND SYLLABI

(Under Choice Based Credit System - Outcome Based Education)

(For the students joining in the

Academic year 2024 – 2025 and afterwards)

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

THE GANDHIGRAM RURAL INSTITUTE

(Deemed to be University)

Gandhigram - 624 302

Dindigul District

Tamil Nadu

THE GANDHIGRAM RURAL INSTITUTE (DEEMED TO BE UNIVERSITY)

Ministry of Education (Shiksha Mantralaya), Govt. of India

Accredited by NAAC with A Grade (3rd Cycle)

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

All Other UG Programmes (2024-2025 onwards)

All UG Courses: Science &Social Science (2024-2025 onwards)

Science: B.Sc (Physics, Chemistry, Maths, Microbiology, Geology, Home Science , TFD) And B.Tech (Civil)

Social Science: BBA, B. Com (Co-op), B.A (Eco), M.A (DA) and M.A (Socio)

Multidisciplinary Courses for All other UG Science & Social Science									
Course Code	**Course Name**	**Programme**	**Semester**	**Credits**	**CFA**		**ESE**		**Total**
					Theory	**Practical**	**Theory**	**Practical**	
24CSUI1101	**Multidisciplinary I**: Digital Marketing	All UG (Social Science)	I	2+1	20	30	30	20	100
24CSUI1202	**Multidisciplinary II**: Web Designing	All UG (Science)	II	2+1	20	30	30	20	100
24CSUI2103	**Multidisciplinary III:** Mobile Application Development	All UG (Science & Social Science)	III	2+1	20	30	30	20	100
Minor Courses for All other UG Science & Social Science									
Course Code	**Course Name**	**Programme**	**Semester**	**Credits**	**CFA**		**ESE**		**Total**
					Theory	**Practical**	**Theory**	**Practical**	
24CSUB2101	**Minor Course I:** Web Programming	All UG (Social Science)	III	3+1	20	30	30	20	100
24CSUB2202	**Minor Course II:** Python Programming	All UG (Science)	IV	3+1	20	30	30	20	100
24CSUB2203	**Minor Course III:** MIS and Computer Applications in Business	B.Com (Co-op)	IV	3+1	20	30	30	20	100
24CSUB3104	**Minor CourseIV:** Data Analysis using R Programming	All UG (Social Science)	V	3+1	20	30	30	20	100
24CSUB4105	**Minor Course V:** Artificial Intelligence Technologies	All UG (Science)	VII	4	40	-	60	-	100
24CSUB4106	**Minor Course VI : (PG Level)** Social Media& Web Analytics	All PG (Social Science)	VII	3+1	20	30	30	20	100

All Other PG Programmes (2024-2025 onwards)

MBA (2024-2025 onwards)									
Course code	**Subject**	**Programme**	**Semester**	**Credits**	**CFA**		**ESE**		**Total**
					Theory	**Practical**	**Theory**	**Practical**	
24CSAP0201	**Core:** Data Analysis and Visualization using Tableau	MBA	II	3+1	20	30	30	20	100
24CSAP0303	**Elective**: Social Media and Web Analytics	MBA	III	3+1	20	30	30	20	100
24CSAP0405	**Elective**: Data Science for Business Analytics	MBA	IV	4	40	-	60	-	100
M.Sc Maths / M.Sc (Gio-Informatics) (2024-2025 onwards)									
Course code	**Subject**	**Programme**	**Semester**	**Credits**	**CFA**		**ESE**		**Total**
					Theory	**Practical**	**Theory**	**Practical**	
24CSAP0202	**Elective**: Artificial Intelligence Technologies	M.Sc Maths / M.Sc (Gio-Informatics)	II	4	40	-	60	-	100
24CSAP0304	**Elective**: Big Data Analytics using R Programming	M.Sc (Gio-Informatics)	III	4	40	-	60	-	100

Diploma (UG / PG) / B.Voc

PG Diploma in Yoga & Applied Gerontology (2024-2025 onwards), Diploma in Textile Technology & B.Voc. (FP, FTQE, RE, OA&ED, FAD, DPT, FEOM)									
Course code	**Subject**	**Programme**	**Semester**	**Credits**	**CFA**		**ESE**		**Total**
					Theory	**Practical**	**Theory**	**Practical**	
24CSAPD101	Internet and Web Technologies	Yoga & Applied Gerontology	I	3+1	20	30	30	20	100
24CSAUD201	Web Designing	Textile Technology	II	2+1	20	30	30	20	100
24CSVI1201	Digital Marketing Lab	All B.Voc.	II	0+3	-	60	-	40	100
24CSVI2102	Web Designing Lab	All B.Voc.	III	0+3	-	60	-	40	100

All other UG & Integrated UG

Course Code &Title	**24CSUI1101** **Multidisciplinary I - DIGITAL MARKETING** **Credits:2+1**		
Degree Level	**All UG Social Science**	**Semester**	**I**
Programme	**BBA, B.Com(Coop), B.A (Eco), M.A (DA),M.A (Socio)**		
Course Objectives	**The Course aims to** • Familiarize students with the concept of digital marketing and its current and future evolutions. • Identify impact of digital space and digital marketing in reaching out to customers. • Learn the importance of Search Engine optimization and marketing. • Acquire the skill of making efficient use of the digital assertions on social media platforms. • Discover effective methods for gathering, arranging, and handling social media data.		
Cognitive Level	K1 - Define the basic concepts of Digital Marketing K2 - Identify the challenges and opportunities of Internet Marketing K3 - Analyse the need of Marketing trends K4 - Apply the techniques of Social Media Marketing K5 - Evaluate the tools of Web Analytics		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction** Evolution of Digital Marketing from traditional to modern era - Role of Internet; Current trends - Info-graphics - Inference for business & society - Emergence of digital marketing - Drivers of the new marketing environment - P.O.E.M.framework.	**8**
II	**Internet Marketing** Internet Marketing, opportunities and challenges - Digital marketing framework – Digital marketing strategy - Digital Marketing mix, Impact of digital channels on IMC - Programmable Digital Marketing – Buying Model	**10**
III	**Marketing Trends** Need for SEO - Use of Search engines and its working patterns - Search Engine Advertising: - Pay for Search Advertisements, Ad Ranks - Introduction to SEM - Trends in digital advertising - Impact of digital advertising.	**10**
IV	**Social Media Marketing** Face book Marketing - LinkedIn Marketing - Twitter Marketing - YouTube marketing - Instagram and Snap chat Marketing - Mobile Marketing - Social media metrics.	**9**

V	**Analytics and Case Study** Web Analytics –Data collection for web analytics – Google analytics –Universal Analytics - Tracking code - Analytical Tools - Case study.	**8**
Total Conduct Hours		**45**

Text Book:

1. Seema Gupta, Digital Marketing, Mc-Graw Hill 1st Edition – 2017.

References:

1. Kamat and Kamat, Digital Marketing, Himalaya publisher, 2023.
2. D. Ryan and Calvin Jones, Marketing Strategies for Engaging the Digital Generation, Kogan Page, 2008.
3. V. Ahuja, Digital Marketing, Oxford University Press, 2015.
4. H. Annmarie and A. Joanna, Quick win Digital Marketing, Oak Tree Press, 2009.

Web References:

1. Moz: https://moz.com/blog
2. HubSpot: https://www.hubspot.com/blog
3. Neil Patel: https://neilpatel.com/blog/
4. Search Engine Land: https://searchengineland.com/
5. Social Media Examiner: https://www.socialmediaexaminer.com/

Course Outcomes	**On successful completion of the course ,the students will be able to** **CO1:** Recognize the real-world applications and concepts of digital marketing. **CO2:** Articulate innovative insights of digital marketing enabling a competitive edge. **CO3:** Understand how to create and run digital media based campaigns. **CO4:** Learn the Digital Marketing Platforms like Face Book, Twitter and YouTube. **CO5:** Find and make use of other technologies, such social media analytics, etc.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	2	3	2	3
CO3	3	2	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Lab Exercises

1. Creating Face book page uploading contacts for invitation.
2. Exercise on fan page: wall posting to increase fans on fan page.
3. Marketing on fan page (with examples).
4. Creating Promotional banner through Canva.
5. Face book Promotion using Banners.
6. Creating the poll in Face book fan Page.
7. Face book advertising.
8. Best practices for Face book advertising.
9. Payment module- CPC vs CPM vs CPA.
10. LinkedIn Marketing.
11. Understanding LinkedIn Company profile.
12. Understanding LinkedIn Individual profiles.
13. Understanding Linked In groups.
14. LinkedIn publishing.
15. Twitter Marketing.
16. Twitter Advertising.
17. Uploading videos on video marketing with thumbnails.
18. YouTube for business.
19. Sending bulk E-Mail.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	2	3	2	3
CO3	3	2	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSUI1202** **Multidisciplinary II–WEB DESIGNING** **Credits: 2+1**		
Degree Level	**UG (Science)**	**Semester**	**II**
Programme	**B.Sc. (Physics, Chemistry, Maths, Microbiology, Geology, Home Science and TFD)**		
Course Objectives	**TheCourseaimsto** • Introduce the basic concepts of Internet and its terminologies • Learn the basic structure of HTML tags • Design static web pages effectively using CSS • Develop Dynamic web pages using DHTML & XML • Describe and utilize JavaScript programming concepts		
Cognitive Level	K1 - Learn the fundamentals of Internet and WWW K2 - Demonstrate the Web page creation using HTML Tags K3 - Prepare web pages using CSS for real time applications K4 - Apply the Mark up Languages and Scripting Languages to validate the web pages		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Internet and HTML** Introduction to Internet and Website, Web server, Internet Addressing- Description of Software for platform-Introduction to HTML, Mark up for Structure, Tags and Attributes - HTML basic Tags.	9
II	**HTML Mark Up Structure** Designing Title & Headings, Designing Body Section – Alignment and Formatting tag- Paragraph Tags- Adding Links - Adding Images – List Creation – Tables-Forms & Frames – Floating frames.	9
III	**Cascade Style Sheet** Introduction, Features and benefits of CSS - Formatting text - Colors and Background - Padding, Borders and Margins - Floating and positioning - Page Layout with CSS-Transition, Transforms and Animation.	9
IV	**XML & DHTML** XML –XML versus HTML- XML Standards - DTD- Types of DTD- Dynamic HTML- Markup Elements – Media Elements - Form Elements - Illustrative Examples.	9
V	**Introduction to JavaScript** Introduction to Java Script-Variables, Operators and Events-Form validation and Event propagation- Client-side scripting -Forms & Validation.	9
Total Conduct Hours		**45**

TextBook:

1. Jennifer Niederst Robbins, Learning Web Design,O"ReillyPublication,2018.

References:

1. Jenifer Niederst Robbins, A Beginners guide to HTML, CSS, JavaScript and Web Graphics, O"Reilly Publication, 2018.
2. Felke-Morris, Basics of Web design: HTML5 & CSS3, 5th edition, Pearson Education, 2019.
3. Felke-Morris, Web development and Design Foundation with HTML5, Pearson Education, 2020.
4. Atul Kahate, XML and Related Technologies, Pearson Education, 2009.

Web Resources:

1. https://www.w3schools.com/html/
2. https://www.geeksforgeeks.org/html-tutorial/

CourseOut comes	**On successful completion of the course , the students will be able to**
	CO1: Recall the fundamental concepts of computer, Internet and Websites.
	CO2: Be familiar with the web programming concepts.
	CO3: Ability to optimize page styles and layout with Cascading Style Sheets (CSS).
	CO4: Understand the use of XML and DHTML in website creation.
	CO5: Design interactive web pages incorporating validation techniques using JavaScript.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

WEB DESIGNING

Write a code using HTML / CSS / XML / JavaScript to the following:

HTML

1. Apply the formatting tags.
2. Implement the different type of List tags.
3. Table and Table formatting tags.
4. Hyperlink creation.
5. Form and Form elements.
6. Frames.

CSS

7. Design text and paragraphs.
8. Tables with different borders styles.
9.

JAVASCRIPT

10. Using variables and operators.
11. Control statements.
12. Validation using functions.
13. Simple questionnaire with validation.
14. Domain-specific application.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	2	3	2	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	2	3	3	3	3

Course Code & Title	**24CSUI2103** **Multidisciplinary III - MOBILE APPLICATION DEVELOPMENT** **Credits : 2+1**		
Degree Level	**UG**	**Semester**	**III**
Programme	**Science:** Chemistry, Maths, Microbiology, Geology, Home Science and TFD. **Social Science:** BBA, B.Com(Coop), B.A (Eco), M.A (DA) &M.A (Socio).		
Course Objectives	**The Course aims to:** • Provide the basic knowledge of Android Programming • Understand how to work with various mobile application development frameworks. • Learn the basics and important design concepts of services.		
Cognitive Level	K1 - Define the principles of Android Mobile application development K2 - Describe User Interface Layouts & Components of Android K3 - Implement Animations in Mobile applications K4 - Demonstrate the launching of Android applications K5 - Evaluate the Android Application Services		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Android Operating System** Introduction to Android Operating System - The Mobile Application Development Lifecycle – History- Categories of Android Application - Anatomy of Android Application - Android terminologies.	9
II	**User Interface & Layouts** Designing User Interfaces with Layouts - Label- Text - Text View - Password Text Box - Button -Image Button- Checkbox- Image - Radio Button - Slider - Auto complete text View.	9
III	**Using Media** Drawing and Working with Animation - Playing Audio and Video - Recording Audio and Video- Speech Recognizer-Text to Speech - Video Player-Canvas.	9
IV	**Android Application Design Essentials** Launching First Android Application - Exploring the Android SDK (IDE). Application Context-Activities - Services – Intents - Receiving and Broadcasting Intents- Android Manifest File and its common settings.	9
V	**Android Application Services** Consuming Web Services Using HTTP - Consuming JSON Services - Creating Own Services - Location based Services - Binding Activities to Services.	9
Total Conduct Hours		**45**

TextBook:

1. Karen Lang and Selim Tezel, Become an App Inventor - The official guide from MIT App Inventor, Miteen Press, Walker Books Limited, 2022.

References:

1. Dawn Griffiths, David Griffiths, Head First Android Development: A Brain-Friendly Guide, 2017.
2. Neil Smyth,Android Studio 3.0 Development Essentials: Android,8th Edition,2017.
3. Wei – Meng Lee, Beginning Android 4 Application development, Wiley India Publication, 2012.

Web Resources:

1. https://developer.android.com/guide
2. http://appinventor.mit.edu/explore/paint-pot-extended-camera

Course Outcomes	**On successful completion of the course ,the students will be able to**
	CO1: Impart the knowledge about basic components needed for Mobile App development.
	CO2: Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
	CO3: Create interactive applications in android with multiple activities including audio, video and notifications.
	CO4: Learn the basic and important design concepts for the development of mobile applications.
	CO5: Utilize the Android application services to create simple Mobile Application.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

MOBILE APPLICATION DEVELOPMENT

Develop Mobile applications using for the following,

1. Textbox and Buttons.
2. Radio buttons and Text view.
3. Font, Layout Managers.
4. Event listeners.
5. Database connectivity.
6. Different types of Menus.
7. Intent and Activity.
8. Dialog Boxes.
9. GUI components.
10. Domain specific applications.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSUB2101** **Minor Course I - WEB PROGRAMMING** **Credits : 3+1**		
Degree Level	**UG**	**Semester**	**III**
Programme	**Social Science: BBA, B. Com (Coop), B.A(Eco), M.A(DA) and M.A(Socio)**		
CourseObjectives	**The Course aims to** • Introduce the basic concepts of Internet and its terminologies. • Learn the basic structure of HTML tags. • Design static web pages effectively using CSS. • Develop Dynamic web pages using DHTML & XML. • Implement web application using JavaScript & PHP.		
Cognitive Level	K1 - Recall the basic definitions and terminologies of Internet K2 - Describe the basic HTML tags K3 - Demonstrate the designing of web pages using CSS K4 - Evaluate the working of XML & DHTML		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Internet and HTML** Introduction to Internet and Website, Web server, Internet Addressing - Description of Software for platform - Introduction to HTML, Mark up for Structure, Tags and Attributes - HTML basic Tags.	12
II	**HTML Mark Up Structure** Designing Title & Headings, Designing Body Section – Alignment and Formatting tags - Paragraph tag- Adding Links – Adding Images – List Creation – Tables - Forms & Frames – Floating frames.	13
III	**Cascade Style Sheet** Introduction, Features and benefits of CSS - Formatting text – Colors and Background – Padding, Borders and Margins – Floating and positioning – Page Layout with CSS-Transition - Transforms and Animation.	13
IV	**XML & DHTML** XML - XML versus HTML- XML Standards – DTD - Types of DTD- Dynamic HTML- Markup Elements - Media Elements - Form Elements-Illustrative Examples.	13
V	**JavaScript & PHP** Introduction to Java Script-Variables, Operators and Events-Form validation and Event propagation- Client-side scripting - Forms & Validation–Introduction to PHP – Reading data in web pages – PHP browser handling.	13
Total Conduct Hours		**64**

TextBook:

1. Jennifer Niederst Robbins, Learning Web Design , O"ReillyPublication,2018.

References:

1. Jenifer Niederst Robbins, A Beginners guide to HTML, CSS, JavaScript and Web Graphics, O"Reilly Publication, 2018.
2. Felke-Morris, Basics of Web design: HTML5 & CSS3, 5th edition, Pearson Education, 2019.
3. Felke-Morris, Web development and Design Foundation with HTML5, Pearson Education, 2020.
4. Atul Kahate, XML and Related Technologies, Pearson Education,2009.
5. Mikael Olsson," PHP 8 Quick Scripting Reference A Pocket Guide to PHP Web Scripting", A press, 3rd Edition, 2020.

Web Resources:

1. https://www.w3schools.com/html/
2. https://www.geeksforgeeks.org/html-tutorial/

Course Outcomes	**On successful completion of the course ,the students will be able to**
	CO1: Recall the fundamental concepts of computer, Internet and World Wide Web.
	CO2: Be familiar with the web programming concepts.
	CO3: Ability to optimize page styles and layout with Cascading Style Sheets (CSS).
	CO4: Understand the use of XML and DHTML in website creation.
	CO5: Design interactive web pages incorporating validation techniques using JavaScript & PHP.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Lab Exercises

HTML

1. Apply the formatting tags.
2. Implement the different type of List tags.
3. Table and Table formatting tags.
4. Hyperlink creation.
5. Form and Form elements.
6. Frames.

CSS

7. Design text and paragraphs.
8. Tables with different borders styles.

JAVA SCRIPT

9. Using variables and operators.
10. Control statements.
11. Validation using functions.
12. Simple questionnaire with validation.
13. Domain-specific application.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSUB2202** **Minor Course II – PYTHON PROGRAMMING** **Credits: 3+1**		
Degree Level	**UG**	**Semester**	**IV**
Programme	**Science:** B.Sc (Physics, Chemistry, Maths, Microbiology, Geology, Home Science,Textlies& Fashion Designing) and B.Tech		
Course Objectives	**The Course aims to:** • Introduce the concepts of compute basics and terminologies. • Understand various Data types and control statements in Python. • Elaborate the usage of functions in Python. • Demonstrate the Lists, Tuples & Dictionaries in Python. • Define the concepts of files and modules.		
Cognitive Level	K1 - State the fundamentals of Programming Languages. K2 - Describe program using Python control flow statements, sequence, selection and repetition control structures K3- Demonstrate the methods to implement the data structures like lists, dictionaries, tuples and sets. K4 - Apply the user defined functions to solve real time applications K5 - Analyze files and modules in Python		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Computer and Python programming**	12
	Introduction to Computer – Types of Computer-Programming languages & History-Fundamentals of computing. Introduction to Python programming - Python Interpreter & Debugging- Applications of Python-Parts of Python programming language-Identifiers – Keywords - Operators – Variables - Data Types-Comments- Statements and Expressions.	
II	**Data types, Statements in Python**	13
	Data types - int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, operators, precedence of operators – comments - Decision control statements: if-else- if- elif - Looping Statements: for, while - continue and break statements - Illustrative Examples.	
	Functions and Strings	
III	Functions - Built-in Functions, Function Definition and Call- Importing User-defined Module - Assert Statement - Command Line Arguments - Strings - Basic String Operations - Accessing Characters in String - String slicing and joining - String Methods - Formatting Strings.	13
IV	**Lists, Tuples & Dictionaries**	13
	Lists - Creating Lists - Basic List Operations - Indexing and Slicing Lists - Built-In Functions used on Lists - advanced list processing - List Methods - Dictionaries: Creating Dictionary - Dictionary methods - Tuples and	

	sets - Creating Tuples - Basic Tuple Operations - Indexing and Slicing in Tuples - Tuple Methods - Sets, Set Methods.	
V	**Files, Modules in Python**	13
	Files and exception: text files, reading and writing files- format operator; command line arguments, errors and exceptions, handling exceptions. - Modules: Creating modules, import statement - Introduction to Numpy, Pandas and Python for data visualization.	
Total Conduct Hours		**64**

TextBooks:

1. Gowrishankar S and Veena A , Introduction to Python Programming, CRC Press,Taylor & Francis Group, 2019.

References:

1. Paul Deitel and Harvey Deitel, Python for Programmers, Pearson Education, 1st Edition, 2021.
2. VamsiKurama, Python Programming: A Modern Approach, Pearson Education, 2018.
3. G Venkatesh and Madhavan Mukund, Computational Thinking: A Primer for Programmers and Data Scientists, Ist Edition, Notion Press, 2021.

Web Resources

1. https://www.w3schools.com/python/python_reference.asp
2. https://www.python.org/doc/

Course Outcomes	**On successful completion of the course ,the students will be able to**
	CO1: Learn the basics of programming languages & Python.
	CO2: Develop the program using Python control flow statements.
	CO3: Decompose a Python program into functions.
	CO4:Working with lists, tuples and dictionaries in Python.
	CO5: Imparted the usage of File handlings & Implementation of modules in Python.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

PYTHON PROGRAMMING

Write a Python Programs for the following:

1. Statements and expressions.
2. Conditionals statements.
3. Lists & Tuples.
4. Sets & Dictionaries.
5. Modules using Functions.
6. String operations.
7. File handling.
8. Exception handling.
9. Standard Libraries (Pandas, NumPy, Matplotlib).
10. Domain - specific applications.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code & Title	**24CSUB2203** **Minor Course III - MIS AND COMPUTER APPLICATIONS IN BUSINESS** **Credits: 3+1**		
Degree Level	**UG - B.Com (Co-op)**	**Semester**	**IV**
Course Objectives	**The Course aims to :** • Understand the basic concepts of computer operations in Business • Provide an in-depth training with Office Automation packages • Provide Database knowledge using Access • Learn the basics of Internet basics and Internet terminologies		
Cognitive Level	K1 - Recall the working principles of Management Information System. K2 - Demonstrate business applications which integrate with E-Commerce K3 - Prepare an applications using MS-Word and MS-Excel K4 - Illustrate the database concepts using MS-Access		

UNIT	CONTENTS	Lecture Schedule
I	**Management Information System** Management Information System (MIS) - Concept and Definition of MIS- Structure of MIS –MIS support for Planning , Organizing and Controlling – Information for Decision Making – MIS and Decision Support Systems – Concept of System - Characteristics of System –Systems classification – Information System Definition (IS) –Types of Information System – Managerial View of IS – Uses of Information System.	13
II	**E-Commerce** Introduction to E-Commerce - Features, Importance – Objectives of E-commerce - E-Commerce - industry - framework – Types of E-Commerce – Reasons for growth of E-commerce - Applications of E-Commerce	13
	MS - Word	
III	MS-Word: Introduction–Features – Document Creation-Document Editing : Cursor Movements – Selecting Text-Copying Text – Moving Text – Finding and Replacing Text-Spelling and Grammar – Page Setup - Table Creation.- Mail Merge.	12
	MS-Excel	
IV	MS-Excel: Introduction – Advantages & Applications – Organization of Workbook - Editing a Worksheet – Range - Formatting Worksheet – Chart: Creation – Changing Type-Print Options - Built-in Functions - Test on Excel Functions.	13

V	**MS-Access** Purpose of Database System ,Definition of Database Management System(DBMS) – Advantages and Disadvantages of DBMS – Instances and Schema , Data Independence - 3 Level architecture - Database Administrator and Database Users - MS-Access : Introduction – Advantages & Applications – Store Data in a Table – Retrieve Data From a Table - Sorting, Searching in a Table – Viewing Data Using Forms – Using SQL Commands – Preparation of Business Reports	13
Total Conduct Hours		**64**

Reference Books:

1. ManagementInformationSystem:CVS.Murthy,HPH.
2. ManagementInformation System: O Brian, TMH.
3. Management Information System:Gordon B.Davis & Margrethe H.Olson, TMH.
4. Information System for Modern Management: Murdick, PHI.
5. Management Information System:Jawadekar,TMH.2007.
6. Microsoft Office System Step by Step, Joyce Cox, Joan Preppernau,Steve Lambert and Curtis Frye,2007.

Course Outcomes	**On completion of the course , students should be able to** **CO1**: Effective the use of Management Information System. **CO2**: Analyze the purpose of E-commerce. **CO3**: Create documents with different formatting in MS-Word. **CO4:** Work with built in functions and Draw Charts using MS-Excel. **CO5**: Store and Retrieve data in database using MS-Access.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	2	2	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Lab Exercises

1. Preparation of Bio Data
2. Agenda
3. Minutes
4. Circular Letters
5. Letters to Various Sectors
6. Mail Merge
7. Designing a News Paper
8. Preparation of Payrolls
9. Invoice
10. Stock Maintenance
11. Charts for Business Analysis, Use of Financial Functions.
12. Preparation of Business Databases & Reports

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	2	2	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSUB3104** **Minor Course IV: Data Analysis using R Programming** **Credits: 3+1**		
Degree Level :	**UG**	**Semester**	**V**
	Social Science: BBA, B.Com(Co-op), B.A(Eco), M.A(Development Administration) and M.A(Sociology)		
Course Objectives	**The Course aims to** • Familiarize the concepts of data analysis. • Identify the fundamentals of R programming environment. • Gain knowledge about the basics of data exploratory methods. • Understands the basic statistical functions in R. • Learn the multivariate analysis methods in R.		
Cognitive Level	K1 - Remember the various data analysis techniques K2 - Summarize various data structures used in R programming K3 - Demonstrate the various statistical functions and visualization functions used in R Programming K4 - Evaluate the functions used for descriptive statistics and time series analysis in R K5 - Analyze the multivariate data analysis techniques used in R Programming		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to R Programming** Introduction to Computer and data analysis - Introduction to data analysis methods - Introduction to R-Programming - Working with Directory - Data types in R - Commands for Data Exploration - Challenges of Analytical Data Processing.	13
II	**Loading and Handling Data in R** Expression Variables and Functions - Missing values Treatment in R - Vectors - Matrices, Factors and List - Common Analytical Tasks - Aggregating and Group Processing of a Variable - Simple analysis using R - Methods for Reading data.	13
III	**Exploring Data in R** Data frames - R functions for understanding data in data frames - Loading data frames - Exploring data - Finding the missing values - Invalid values and outliers- Descriptive statistics.	13
IV	**Data Visualization and Statistics** Time Series in R - Data Visualization commands in R - Probability Distributions - Correlation Analysis - Regression - Analysis of Co-Variance	12
V	**Multivariate analysis** Forecasting - Discriminative Analysis – Exploratory Factor Analysis - Cluster Analysis: Partitioning Methods – Decision Tree - Case Studies.	13
Total Conduct Hours		**64**

TextBooks:

1. Data Analytics using R, Seema Acharya, McGraw Hill Education, 2018.
2. Data Analysis using R Programming, Jeeva Jose, Khanna Book Publishing, 2019.

References:

1. The Art of R Programming, Norman Matloff, Cengage Learning, 2011.
2. Big Data Analytics with R, Simon Walkowiak, Packt Publishing, 2016.
3. R for Everyone: Advanced Analytics and Graphics, Jared P. Lander, Second Edition 2017.

E-References:

1. http://cran.r-project.org
2. https://medium.com/iecse-hashtag/programming-in-r-a-case-study-c1a469e5e68
3. https://bookdown.org/siju_swamy/Stat_Lab/correlation-and-regression-analysis-in-r.html#correlation-analysis

Course Outcomes	**On successful completion of the course, the students will be able to**
	CO1: Outline the characteristics of various data analysis techniques and its challenges.
	CO2: Define and explain the various data structures and fundamental concepts of R programming environments.
	CO3: Describe the various methods to explore data in R environment.
	CO4: Demonstrate the various statistical functions in R.
	CO5: Analyze the multivariate data analysis techniques used in R programming and discover the options for generating data visualizations in R.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

DATA ANALYSIS USING R PROGRAMMING LAB

Develop R code to demonstrate

1. Control structures.
2. Functions.
3. Data structures and their operations. (Vector, List, Array, Matrix, Factor and Dataframe)
4. Reading and writing files.
5. Descriptive statistics.
6. Data visualization.
7. Central tendency, mean, variance and standard deviation.
8. Probability distributions.
9. Correlation and Covariance.
10. Time Series analysis.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Title & Code:	**24CSUB4105** **Minor Course V: ARTIFICIAL INTELLIGENCE TECHNOLOGIES**		
Course Code:	**Credits: 4**		
Degree Level:	**UG**	**Semester**	**VII**
Programme:	**Science:**B.Sc (Physics, Chemistry, Maths, Microbiology, Geology, Home Science and TFD)		
Course Objectives	**The Course aims to** • Study the basic concepts of Artificial Intelligence. • Understanding of the fundamental issues and challenges of machine learning. • Learn the knowledge representation techniques, reasoning techniques and planning in machine learning. • Understand the basic theory underlying Deep learning. • Gain adequate knowledge to apply the Deep learning techniques in solving real world problems.		
Cognitive Level	K1 - Remember the basic definitions of Artificial Technologies K2 - Summarize the Machine Learning Techniques K3 - Evaluate the Deep Learning Techniques		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to AI** Artificial Intelligence: The AI Problems – The Underlying Assumption– AI Technique: The level of the Model – Criteria for Success Problems, Problem Spaces and Search : Defining the Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programs	**13**
II	**Introduction to Machine Learning** Machine Learning – How do machines learn ? – Well-posed learning problem – Types of Machine Learning – Comparison – supervised, unsupervised and reinforcement learning – Applications	**13**
III	**Machine Learning Techniques** Classification model – Classification learning steps – Common Classification algorithms – Regression algorithm – Clustering techniques – Association rule	**12**
IV	**Introduction to Deep Learning** AI and deep learning – The history and rise of Deep learning – Importance of Deep learning – The motivation of Deep Architecture – Applications	**13**

V	**Deep Learning Techniques** Getting Started with Neural Networks: Multilayer Perceptron's – How a network learns –Deep learning models – Originsof CNNs – Convolutional Neural Networks – Popular CNN architectures – Case study.	**13**
Total Conduct Hours		**64**

TextBooks:

1. Kevin Knight and Shiva Shankar B Nair, Artificial Intelligence, Elaine Rich,3rd Edition, Tata Mc-Graw, Hill publications,2014.
2. Saikat Dutt, Subramanian Chandramouli and Amit Kumar Das, Machine Learning, Pearson Publication, 2019.
3. Anurag Bhardwaj, Wei Di, Jianing Wei,Deep Learning Essentials, Packt Publishing, 2018.

References:

1. S. Russell and Peter Norvig.,Artificial Intelligence: A Modern Approach, Prentice Hall, 3rd Edition, 2019.
2. Nils J. Nilsson.,The Quest for Artificial Intelligence, Cambridge University Press, 2009.
3. William F. Clocks in and Christopher S. Mellish., Programming in Prolog : Using the ISO Standard, Springer,5th Edition, 2003.

Web References:

1. Stanford Encyclopedia of Philosophy – Artificial Intelligence: https://plato.stanford.edu/entries/artificial-intelligence/
2. https://towardsdatascience.com/
3. https://www.coursera.org/learn/machine-learning
4. https://www.coursera.org/specializations/deep-learning
5. https://course.fast.ai/

CourseOutcomes	**On successful completion of the course, the students will be able to** **CO1:** Gain a solid understanding of the fundamental concepts, principles and methodologies related to Artificial Intelligence. **CO2:** Explain the basic concepts and terminology of machine learning **CO3:** Implement and apply various machine learning algorithms **CO4:** Understanding of the fundamental principles and architectures of deep learning **CO5:** Develop and implement various neural network architectures

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	3	3	2	2	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	24CSUB4106 Minor Course VI : SOCIAL MEDIA AND WEB ANALYTICS Credits: 3+1		
Degree Level:	**PG**	**Semester**	**VII**
CourseObjectives	**The Course aims to** • Familiarize the concepts of Data Analytics • Identify the types of Social Media Analytics • Gain knowledge about the Analytical Process • Understands the basics of Web Analytics • Familiarize the emerging trends in social media Analytics and Tools		
Cognitive Level	K1 - Define the basics of social media data and analytics K2 - Identify the analytical process, associated metrics and tools K3 - Analyze the fundamentals of web analytics K4 - Apply social media analytics for real time applications K5 - Criticize the potential impactof social and web analytics		

UNIT	CONTENTS	Lecture Schedule
I	**INTRODUCTION** Foundation for Analytics: – Digital Gap – Social Media Data Sources – Defining Social Media Data – Data Sources in Social Media Channels - Estimated vs Factual Data Sources – Public and Private Data - Data Gathering in Social Media Analytics. From Data to Insights: Actionable Analytics– Choosing a good analytics tool – Data Aggregation calculations - Stages of Analytics.	13
II	**ANALYTICS IN SOCIAL MEDIA** Analytics in Social Media: Types of analytics - Dedicated Vs. Hybrid Tools – Dedicated tools – Hybrid tools – Advantages and disadvantages - Data Integration Tools - Social Network Landscape.	13
III	**ANALYTICAL PROCESS** Analytic Process – Metrics: The Basis for Analysis – Default and Custom Metrics – Metric Categories - Graphs - Metrics and Strategy : Selecting the Best Metrics for the Job – Dashboard**s:** Purpose – Suggestion – Default Vs custom Dashboards – Reports **:** Elements of Reporting – Reporting Approaches – Animation and effects.	13
IV	**WEB ANALYTICS** Web Analytics - Present and Future, Data Collection - Importance and Options, Overview of Qualitative Analysis - Business Analysis - KPI and Planning - Critical Components of a Successful Web Analytics Strategy - Web Analytics Fundamentals – Concepts - Proposals & Reports - Web Data Analysis.	13
V	**EMERGING TRENDS** Google Analytics – Sentiment Analysis – Social Network Analysis - Face book Analytics -Advanced analytics – Social Media Analytical Tools - Case Studies	12
Total Conduct Hours		**64**

Text Book:

1. Alex Goncalves, Social Media Analytics Strategy-Using Data to Optimize Business Performance, APress, 2017.

References:

1. Avinash Kaushik, Web Analytics - An Hour a Day, Wiley Publishing, 2007.
2. Clifton B., Advanced Web Metrics with Google Analytics, Wiley Publishing, Inc. 2nd Edition, 2010.
3. Marshall Sponder , Social Media Analytics: Effective Tools for Building, Interpreting, and Using Metrics, McGraw Hill LLC, 2011.
4. Tom Funk, Advanced Social Media Marketing - How to Lead, Launch, and Manage A Successful Social Media Program, Apress, 2013.
5. Bali, Raghav, et al. Learning Social Media Analytics with R. India, Packt Publishing, 2017.
6. Ramesh Sharda, Dursun Delen, Efraim Turban, Business Intelligence and Analytics: Systems for Decision Support, Pearson Education, 2018.

Web Resources

1. https://therushrepublic.com/a-complete-guide-to-social-media-analytics/
2. https://blog.hootsuite.com/facebook-audience-insights/
3. https://blog.hubspot.com/blog/tabid/6307/bid/31147/the-ultimate-guide-to-mastering-pinterest-for-marketing.aspx
4. https://www.klipfolio.com/resources/dashboard-examples/social-media/facebook-dashboards

Course Outcomes	**On successful completion of the course , the students will be able to**
	CO1: Outline the basics of Social Media Analytics.
	CO2: Gain knowledge on various types of analytical tools and their Significance.
	CO3: Understanding the Analytical Process and Associated Metrics.
	CO4: Describe the fundamental concepts of Web Analytics.
	CO5: Enhance the knowledge of analytical processes in real world applications.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	3	3
CO3	3	2	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Social Media and Web Analytics Lab

Perform the following using open-source tools

1. Sentiment Analysis
2. Engagement Analysis
3. Performance Analysis
4. Web Traffic Analysis
5. Social Network Analysis
6. Influencer Analysis

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	3	3
CO3	3	2	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

All other PG Courses

Course Code &Title	24CSAP0201 Core: DATA ANALYSIS AND VISUALIZATION USING TABLEAU Credits: 3+1		
Programme	**MBA**	**Semester**	**II**
Course Objectives	**The Course aims to** • Outline the basic concepts of Data Visualization. • Familiarize the design principles of Data Visualization techniques and Exploratory Data Analysis. • Impart knowledge on Data Visualization Tools focusing on Tableau. • Demonstrate the Time Series analysis and Forecasting in Tableau.		
Cognitive Level	K1 - Recall the basic concepts of Data Visualization K2 - Demonstrate the design principles for effective data Visualization K3 - Analyze the Exploratory Data Visualization K4 - Illustrate the fundamentals of Tableau K5 -Perform case studies for time series analysis and forecasting		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Data Visualization** Introduction: Data Visualization Definition - Graphics and Computing - History of Data Visualization - Analyzing Milestone Data, Goals – Functions of Data Visualization, Framework – Stages of Data Visualization - Properties of Data Visualization - Types of Data Visualizations (e.g., charts, graphs, maps)	13
II	**Data Visualization Principles** Data Visualization Principles - Design principles for effective data visualization - Color theory and usage in data visualization, Human perception and cognition in visualization design - Tools and Techniques - Introduction to data visualization tools (e.g., Tableau, Python libraries) - Creating basic charts and graphs, Interactive and dynamic visualizations.	13
III	**Exploratory Data Visualization** Exploratory Data Visualization - Data exploration and visual data profiling - Univariate and multivariate data visualization - Visualizing patterns - Outliers and distributions - Storytelling with Data - Narrative structure in data storytelling -Building data driven narratives - Using visualizations to support story telling.	13
IV	**Fundamentals of Tableau** Introduction to Tableau – Installation – Tableau Interface – Data Importing – Continuous and discrete data – Different kinds of plots and their usage (bar chart, line chart, scatter plot, histogram, dual axis) – Parameters – Functions and calculated field – Row and aggregate calculations.	12
V	**Time Series and Forecasting**	13

	Time series analysis – Bin & group – Filtering and sorting data - Forecast & clusters – Joins and blends – Dashboard and interactive plots – Data interpretation – Connecting to real time database - Advanced Chart Types.	
Total Conduct Hours		**64**

References:

1. Cole Nussbaumer Knaflic, Storytelling with Data: A Data Visualization Guide for Business Professionals, Wiley, 2015.
2. Kieran Healy, Data Visualization: A Practical Introduction, Princeton University Press, 2018.
3. Nathan Yau, Visualize This: The Flowing Data Guide to Design, Visualization, and Statistics, 1st Edition, Wiley, 2011.
4. Joshua N. Milligan, Learning Tableau, Fourth Edition, Packt, 2020.
5. Ryan Sleeper, Practical Tableau 100 Tips, Tutorials, and Strategies from a Tableau Zen Master, O'Reilly Media, 2018.

E-References:

1. https://www.geeksforgeeks.org/what-is-univariate-bivariate-multivariate-analysis-in-data-visualisation/
2. https://powerbi.microsoft.com/en-in/data-storytelling/#:~:text=Data%20storytelling%20is%20the%20concept,and%20inform%20a%20particular%20audience.
3. https://www.tableau.com/learn/training
4. https://www.geeksforgeeks.org/tableau-tutorial/

Course Outcomes	**On successful completion of the course, the students will beable to** **CO1 :** Understand importance of data, analyzing, reasoning about data through Visualizations. **CO2 :**Understand the goals, principles, functions and framework of Data Visualization **CO3:** Evaluate univariate and multivariate data visualization**.** **CO4 :**Acquire knowledge on TABLEAU to explore meaningful and Insightful information in the data. **CO5 :**Build models for time series analysis and forecasting

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	2	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

DATA ANALYSIS AND VISUALIZATION USING TABLEAU

Perform the following using Tableau,

1. Connecting with Data Source
2. Working with Excel files
3. Data Blending
4. Data Visualization
5. Tableau Operators
6. Tableau Functions
7. Aggregate Functions
8. Sorting and filtering
9. Dashboards
10. Forecasting

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	2	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	24CSUP0303 Elective : SOCIAL MEDIA AND WEB ANALYTICS Credits: 3+1		
Programme	**MBA**	**Semester**	**III**
CourseObjectives	**The Course aims to:** • Familiarize the concepts of Data Analytics • Identify the types of Social Media Analytics • Gain knowledge about the Analytical Process • Understands the basics of Web Analytics • Familiarize the on emerging trends in social media Analytics and Tools		
Cognitive Level	K1 - Define the basics of social media data and analytics K2 - Identify the analytical process, associated metrics and tools K3 -Analyze the fundamentals of web analytics K4 - Apply social media analytics for real time applications K5 - Criticize the potential impact of social and web analytics		

UNIT	CONTENTS	Lecture Schedule
I	**INTRODUCTION** **Foundation for Analytics**: – Digital Gap – Social Media Data Sources – Defining Social Media Data – Data Sources in Social Media Channels – Estimated vs. Factual Data Sources – Public and Private Data - Data Gathering in Social Media Analytics. **From Data to Insights**: Actionable Analytics– Choosing a good analytics tool – Data Aggregation calculations - Stages of Analytics.	13
II	**ANALYTICS IN SOCIAL MEDIA** **Analytics in Social Media**: Types of analytics - Dedicated Vs. Hybrid Tools – Dedicated tools – Hybrid tools – Advantages and disadvantages - Data Integration Tools**.** Social Network Landscape**.**	13
III	**ANALYTICAL PROCESS** **Analytic Process** – **Metrics**: The Basis for Analysis – Default and Custom Metrics – Metric Categories - Graphs - Metrics and Strategy: Selecting the Best Metrics for the Job – **Dashboards:** Purpose – Suggestion – Default Vs custom Dashboards - **Reports:** elements of Reporting – Reporting Approaches – Animation and effects	13
IV	**WEB ANALYTICS** **Web Analytics** - Present and Future, Data Collection - Importance and Options, Overview of Qualitative Analysis, Business Analysis, KPI and Planning, Critical Components of a Successful Web Analytics Strategy, Web Analytics Fundamentals, Concepts, Proposals & Reports, Web Data Analysis	13
V	**EMERGING TRENDS** Google Analytics – Sentiment Analysis – Social Network Analysis - Face book Analytics -Advanced analytics – Social Media Analytical Tools - Case Studies	12

Total Conduct Hours	64

Text Book:

1. Alex Goncalves, Social Media Analytics Strategy-Using Data to Optimize Business Performance, A Press, 2017.

References:

1. Avinash Kaushik, Web Analytics - An Hour a Day, Wiley Publishing, 2007.
2. Clifton B., Advanced Web Metrics with Google Analytics, Wiley Publishing, Inc. 2nd Edition, 2010.
3. Marshall Sponder , Social Media Analytics: Effective Tools for Building, Interpreting, and Using Metrics, McGraw Hill LLC, 2011.
4. Tom Funk, Advanced Social Media Marketing - How to Lead, Launch, and Manage A Successful Social Media Program, A press, 2013.
5. Bali, Raghav, et al. Learning Social Media Analytics with R. India, Packt Publishing, 2017.
6. Ramesh Sharda, Dursun Delen, Efraim Turban, Business Intelligence and Analytics: Systems for Decision Support, Pearson Education, 2018.

Web Resources

1. https://therushrepublic.com/a-complete-guide-to-social-media-analytics/
2. https://blog.hootsuite.com/facebook-audience-insights/
3. https://blog.hubspot.com/blog/tabid/6307/bid/31147/the-ultimate-guide-to-mastering-pinterest-for-marketing.aspx
4. https://www.klipfolio.com/resources/dashboard-examples/social-media/facebook-dashboards

Course Outcomes	**On successful completion of the course, the students will be able to** **CO1:** Outline the basics of Social Media Analytics **CO2:** Gain knowledge on various types of analytical tools and their Significance. **CO3:** Understanding the Analytical Process and Associated Metrics **CO4:** Describe the fundamental concepts of Web Analytics **CO5:** Enhance the knowledge of analytical processes in real world applications.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Social Media and Web Analytics Lab

Perform the following using open source tools

1. Sentiment Analysis
2. Engagement Analysis
3. Performance Analysis
4. Web Traffic Analysis
5. Social Network Analysis
6. Influencer Analysis

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	24CSAP0405 Elective : DATA SCIENCE FOR BUSINESS ANALYTICS Credits: 3+1		
Class	**MBA**	**Semester**	**IV**
CourseObjectives	**The Course aims to :** • Introduce the basic concepts of Data Science. • Explain Business Analytics terminologies and concepts. Analyze the process of Predictive, Prescriptive Analytics in business applications.		
Cognitive Level	K1 - Identify the need of Data Science K2 - Demonstrate the Importance of Business Analytics K3 - Analyze the Descriptive Analytics and Predictive Analytics K4 – Criticize the applications of Business Analytics		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Data Science** Need for data science – benefits and uses – facets of data – data science process – setting the research goal – retrieving data – cleansing, integrating, and transforming data – exploratory data analysis – build the models – presenting and building applications.	13
II	**Business Analytics** Business Analytics - Terminologies, Process, Importance, Relationship with Organisational Decision Making, Analytics in Decision Making, BA for Competitive Advantage.	12
III	**Descriptive Analytics** Introduction to Descriptive analytics – Visualising and Exploring Data - Descriptive Statistics - Sampling and Estimation - Probability Distribution for Descriptive Analytics - Analysis of Descriptive analytics.	13
IV	**Predictive Analytics** Introduction to Predictive analytics - Logic and Data Driven Models - Predictive Analysis Modeling and procedure - Data Mining for Predictive analytics - Analysis of Predictive analytics -Introduction to Prescriptive analytics - Prescriptive Modeling.	13
V	**Applications of Business Analytics** Retail Analytics, Marketing Analytics, Financial Analytics, Healthcare Analytics, Supply Chain Analytics.	13
Total Conduct Hours		**64**

References:

1. David Cielen, Arno D. B. Meysman, and Mohamed Ali, Introducing Data Science, Manning Publications, 2016.
2. Jeffrey S. Saltz, Jeffrey M. Stanton, An Introduction to Data Science, SAGE Publication, 2017.

3. Christian Albright S and Wayne L. Winston, Business Analytics - Data Analysis and Decision Making, Fifth edition, Cengage Learning, 2015.
4. James R. Evans, Business Analytics - Methods, Models and Decisions, Pearson Ed, 2012.
5. Bhimasankaram Pochiraju and Sridhar Seshadri, Essentials of Business Analytics: An Introduction to the methodology and its applications, Springer, 2019.

Web Resources:

1. https://www.ibm.com/topics/data-science
2. https://intellipaat.com/blog/applications-of-business-analytics/
3. https://www.w3schools.com/datascience/ds_introduction.asp

Course Outcomes	**On successful completion of the course , the students will be able to**
	CO1: Outline the basics of Data Science. **CO2:**Gain knowledge on fundamental concepts of Business Analytics and its terminologies. **CO3:** Understanding the process of Descriptive Analytics. **CO4:** Analyze Predictive and Prescriptive Analytics. **CO5:** Enhance the knowledge of analytical processes in real world business applications.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	2	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Title & Course Code:	**24CSAP0202** **Elective : ARTIFICIAL INTELLIGENCE TECHNOLOGIES** **Credits: 4**		
Degree Level:	**PG**	**Semester**	**II**
Programme:	**M.Sc (Maths & Gio – Informatics)**		
Course Objectives	**The Course aims to** • Study the basic concepts of Artificial Intelligence • Understanding of the fundamental issues and challenges of machine learning • Learn the knowledge representation techniques, reasoning techniques and planning in machine learning • Understand the basic theory underlying Deep learning • Gain adequate knowledge to apply the Deep learning techniques in solving real world problems		
Cognitive Level	K1 - Remember the basic definitions of Artificial Technologies K2 - Summarize the Machine Learning Techniques K3 - Evaluate the Deep Learning Techniques		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to AI** Artificial Intelligence: The AI Problems – The Underlying Assumption – AI Technique: The level of the Model – Criteria for Success Problems, Problem Spaces and Search: Defining the Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programs	**13**
II	**Introduction to Machine Learning** Machine Learning – How do machines learn? – Well-posed learning problem – Types of Machine Learning – Comparison – supervised, unsupervised and reinforcement learning – Applications	**13**
III	**Machine Learning Techniques** Classification model – Classification learning steps – Common Classification algorithms – Regression algorithm – Clustering techniques – Association rule	**12**
IV	**Introduction to Deep Learning** AI and deep learning – The history and rise of Deep learning –Importance of Deep learning – The motivation of Deep Architecture – Applications	**13**
V	**Deep Learning Techniques** Getting Started with Neural Networks: Multilayer Perceptron's – How a network learns –Deep learning models – Origins of CNNs – Convolutional Neural Networks – Popular CNN architectures – Case study	**13**
Total Conduct Hours		**64**

Text Books:

1. Kevin Knight and Shiva Shankar B Nair, Artificial Intelligence, Elaine Rich,3rdEdition, Tata Mc-Graw, Hill publications,2014.
2. Saikat Dutt, Subramanian Chandramouli and Amit Kumar Das, Machine Learning, Pearson Publication, 2019.
3. Anurag Bhardwaj, Wei Di, JianingWei,Deep Learning Essentials, Packt Publishing, 2018.

References:

1. S. Russell and Peter Norvig., Artificial Intelligence: A Modern Approach,
2. PrenticeHall, 3rd Edition, 2019.
3. Nils J. Nilsson.,The Quest for Artificial Intelligence, Cambridge University Press, 2009.
4. William F. Clocksin and Christopher S. Mellish., Programming in Prolog : Using the ISO Standard, Springer,5th Edition, 2003.

Web References:

1. Stanford Encyclopedia of Philosophy – Artificial Intelligence: https://plato.stanford.edu/entries/artificial-intelligence/
2. https://towardsdatascience.com/
3. https://www.coursera.org/learn/machine-learning
4. https://www.coursera.org/specializations/deep-learning
5. https://course.fast.ai/

Course Outcomes	**On successful completion of the course, the students will be able to** **CO1:** Gain a solid understanding of the fundamental concepts, principles and methodologies related to Artificial Intelligence. **CO2:** Explain the basic concepts and terminology of machine learning **CO3:** Implement and apply various machine learning algorithms **CO4:** Understanding of the fundamental principles and architectures of deep learning **CO5:** Develop and implement various neural network architectures

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	2	3	2	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSAP0304** **BIG DATA ANALYTICS USING R PROGRAMMING** **Credits: 4**		
Degree Level:	**PG**	**Semester**	**III**
Programme	**M.Sc. (Gio- Informatics)**		
Course Objectives	**The Course aims to:** • Provide an overview of Big Data Analytics • Describe big data analytics technologies • Discuss about R Packages for big data analytics		
Cognitive Level	K1 - Define background and overview of Big data analytics K2 – Describe data modeling techniques K3 - Implement the Data Visualization using R Packages		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Big data**	12
	Data, classification Of Digital Data -- structured, unstructured, semi-structured data - characteristics of data - evaluation of big data - definition and challenges of big data - what is big data and why to use big data - business intelligence Vs. big data.	
II	**Big data Analytics**	13
	What is and isn't big data analytics? Why hype around big data analytics - Classification of analytics - top challenges facing big data - importance of big data analytics - technologies needed to meet challenges of big data.	
III	**Introduction to R and getting started with R**	
	What is R - Why R - advantages of R over other programming languages - Data types in R logical - numeric, integer, character, double, complex, raw, ls() - command, expressions, variables and functions - control structures – Array – Matrix – Vectors.	13
IV	**Exploring data in R**	13
	Data frames-data frame access - ordering data frames - R functions for data frames dim(), nrow(), ncol(), str(), summary(), names(), head(), tail(), edit() - Load data frames - reading from .CSV files, reading from tab separated value files, reading from tables.	
V	**Data Visualization using R**	13
	Reading and getting data into R (External Data): XML files, Web Data, JSON files, Databases, Excel files. Working with R Charts and Graphs: Histograms, Bar Charts, Line Graphs, Scatter plots, Pie Charts.	
Total Conduct Hours		**64**

TextBooks:

1. Seema Acharya , Subhashini Chellappan --- Big Data And Analytics second edition, Wiley
2. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.
3. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Rajkamal, Preeti Saxena, McGraw Hill, 2018.
4. Big Data, Big Analytics: Emerging Business intelligence and Analytic trends for

Today's Business, Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, John Wiley &Sons, 2013.

References:

1. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team.

Web Resources :

1. https://www.tutorialspoint.com/big_data_analytics/index.htm
2. https://www.geeksforgeeks.org/what-is-big-data-analytics/

Course Outcomes	**On successful completion of the course, the students will be able to**
	CO1: Understand data and classification of digital data.
	CO2: Comprehend the fundamentals of big data analytics.
	CO3: Understand the data types in R.
	CO4: Organize data in the form of R objects and manipulate them as needed.
	CO5: Perform data visualization using R packages.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Diploma (UG/PG)/B.Voc / Certificate Courses

Course Code & Title	24CSAPD0101 INTERNET AND WEB TECHNOLOGIES Credits: 3+1		
Degree Level:	PG Diploma Courses	Semester	I
Programme:	P.G. Dip. (Yoga, Applied Gerontology)		
Course Objectives	The Course aims to : • Describe the architecture and protocols of the Internet • Create well-structured HTML documents for web pages • Follow best practices for creating web content that complies with HTML, CSS, and accessibility standards • Apply theoretical knowledge to real-world scenarios through hands-on projects and assignments • Develop a portfolio of web projects to demonstrate proficiency in Internet and web technologies		
Cognitive Level	K1 - Define the principles of Internet and Communication Technology K2 - Describe the components of web technology K3 - Develop the web pages using CSS & XML K4 - Validate the web pages using JavaScript		

UNIT	CONTENTS	Lecture Schedule
I	**Internet and Communication Technology** Internet Basics and Internet Terminologies - Network Basics and its Terminologies Introduction - Advantages of Networks - Types of Networks and its Working Principles - Network Topologies - Communication Channels - Internetworking Devices - Bridges, Routers and Gateways.	12
II	**Introduction to web technology** WWW, HTTP, TELNET: Introduction - Brief History of WWW - the Basics of WWW and Browsing, Hyper Text Markup Language - Common Gateway Interface - Remote Login – DNS – Client – Server.	13
III	**Introduction to HTML** Generations- Anchor Tag - Hyper Links - Head and Body Sections – Text Formatting - Designing the Body Section - Ordered List, Unordered List and Nested Lists - Ordered and Unordered List - Forms and Frames: Form Elements.	13
IV	**Cascade Style Sheet** Introducing Cascading style sheet - Formatting colours and background - Formatting Heading, Paragraph text - Formatting Table - Formatting images - Display Positioning - List Tables - Text Fonts - Box Model - More CSS Techniques	13
V	**JavaScript and XML** XML: Introduction - Syntax - XML Document Structure - Document Type Definitions - Introduction to JavaScript - Anatomy of a Script - Variables, Operators and Events - Polyfills - Java Script Libraries - Database connection with JavaScript	13
Total Conduct Hours		**64**

TextBooks:

1. Jennifer Niederst Robbins ,Learning Web Design, Reilly Publication, 2018
2. C Xavier,World Wide Web design with HTML, 13/e, , Tata Mc Graw-Hill Publishing, 2006.
3. Andrew S. Tanenbaum and David JWetherall, Computer Networks, Fifth Edition, Pearson Publications, 2011

References:

1. Alexis leon and Mathew leon , Internet for everyone, 2/e, Vikas publication, 2011.
2. Chong Lip Phang, Web coding Bible, Chong Lip Phang, 2020.
3. Alexis leon and Mathew leon, Internet for everyone, 2/e, Vikas publication, 2011.
4. .C Xavier, World Wide Web design with HTML, 13/e, Tata McGraw-Hill Publishing, 2006.

Web References:

1. Mozilla Developer Network (MDN) Web Docs: https://developer.mozilla.org/en-US/
2. W3C (World Wide Web Consortium): https://www.w3.org/
3. WebPlatform.org: http://www.webplatform.org/
4. Stack Overflow: https://stackoverflow.com/
5. CSS-Tricks: https://css-tricks.com/
6. Smashing Magazine: https://www.smashingmagazine.com/
7. A List Apart: https://alistapart.com/
8. Web Design Weekly: https://web-design-weekly.com/

Course Outcomes	**On successful completion of the course, the students will be able to** **CO1:** Understand the basic concepts of the Internet, including its history, structure, and protocols. **CO2:** Understand the basics of HTTP/HTTPS, DNS, URL, and the roles of client-server. **CO3:** Proficiency in writing HTML code to define the structure of web pages. **CO4:** Understand the fundamentals of CSS and be able to combine it with HTML to style webpages. **CO5:** Understand the structure and syntax of XML documents and be able to parse XML data using JavaScript.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Lab Exercises

1. Create a simple page using HTML.
2. HTML code to apply the formatting tags in a Webpage.
3. HTML code to apply the List tags in a Webpage.
4. HTML code to apply the Table and Table formatting tags.
5. HTML code to apply the Form and Form elements.
6. HTML code to apply the Frames.
7. CSS code to design background.
8. CSS code to design text and paragraphs.
9. CSS code to design table.
10. Simple Java Script code to understand the variables and operators utilization.
11. Java Script code to use control statements.
12. Java Script code to validate the content of the website using functions.
13. Java Script code to connect a database with the website.
14. Java Script code to get and store the registration form.
15. XML code defines the structure of the document.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSAUD201** **WEB DESIGNING** **Credits : 2+1**		
Degree Level	**UG (Diploma in Textile Technology)**	**Semester**	**I**
Course Objectives	**The Course aims to** • Introduce the basic concepts of Internet and its terminologies. • Learn the basic structure of HTML tags. • Design static web pages effectively using CSS. • Develop Dynamic web pages using DHTML & XML. • Describe and utilize JavaScript programming concepts.		
Cognitive Level	K1 - Learn the fundamentals of Internet and WWW K2 - Demonstrate the Web page creation using HTML Tags K3 - Prepare web pages using CSS for real time applications K4 - Apply the Mark up Languages and Scripting Languages to Validate the web pages		

UNIT	CONTENTS	Lecture Schedule
I	**Introduction to Internet and HTML** Introduction to Internet and Website, Web server, Internet Addressing - Description of Software for platform - Introduction to HTML - Mark up for Structure, Tags and Attributes - HTML basic Tags.	9
II	**HTML Mark Up Structure** Designing Title & Headings, Designing Body Section – Alignment and Formatting tags- Paragraph tag - Adding Links - Adding Images – List Creation – Tables - Forms & Frames – Floating frames.	9
III	**Cascade Style Sheet** Introduction, Features and benefits of CSS - Formatting text - Colors and Background - Padding, Borders and Margins - Floating and positioning - Page Layout with CSS-Transition, Transforms and Animation.	9
IV	**XML & DHTML** XML – XML versus HTML - XML Standards – DTD - Types of DTD- Dynamic HTML- Markup Elements – Media Elements - Form Elements - Illustrative Examples.	9
V	**Introduction to JavaScript** Introduction to Java Script - Variables, Operators and Events - Form validation and Event propagation- Client-side scripting -Forms & Validation.	9
Total Conduct Hours		**45**

Text Books:

1. Jennifer Niederst Robbins , Learning Web Design , O‟ReillyPublication,2018

References:

1. Jenifer Niederst Robbins, A Beginners guide to HTML, CSS, JavaScript and Web Graphics, O‟Reilly Publication, 2018.
2. Felke-Morris, Basics of Web design: HTML5 & CSS3, 5th edition, Pearson Education, 2019.
3. Felke-Morris, Web development and Design Foundation with HTML5, Pearson Education, 2020.
4. Atul Kahate, XML and Related Technologies, Pearson Education, 2009.

Web Resources:

1. https://www.w3schools.com/html/
2. https://www.geeksforgeeks.org/html-tutorial/

Course Outcomes	**On successful completion of the course , the students will be able to**
	CO1: Recall the fundamental concepts of computer, Internet and World Wide Web. **CO2:** Be familiar with the web programming concepts. **CO3:** Ability to optimize page styles and layout with Cascading Style Sheets (CSS). **CO4**: Understand the use of XML and DHTML in website creation. **CO5:** Design interactive web pages incorporating validation techniques using JavaScript.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	2	3	2	3
CO3	3	2	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

WEB DESIGNING

Write a code using HTML / CSS / XML / JavaScript to the following:

HTML

1. Apply the formatting tags.
2. Implement the different type of List tags.
3. Table and Table formatting tags.
4. Hyperlink creation.
5. Form and Form elements.
6. Frames.

CSS

7. Design text and paragraphs.
8. Tables with different borders styles.

JAVASCRIPT

9. Using variables and operators.
10. Control statements.
11. Validation using functions.
12. Simple questionnaire with validation.
13. Domain-specific application.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code & Title	24CSVI1201 DIGITAL MARKETING LAB Credits: 0+3		
Degree Level:	**B.Voc**	**Semester**	**II**
Programme:	**B.Voc** (FP, FTQE, RE, OA&ED, FAD, DPT, FEOM)		
Course Objectives	**The Course aims to:** • Familiarize students with the concept of digital marketing and its current and future evolutions. • Identify impact of digital space and digital marketing in reaching out to customers. • Learn the importance of Search Engine optimization and marketing. • Acquire the skill of making efficient use of the digital assertions on social media platforms. • Discover effective methods for gathering, arranging, and handling social media data.		
Cognitive Level	**K1-K3**		

Lab Exercises

1. Creating Face book page uploading contacts for invitation
2. Exercise on fan page: wall posting to increase fans on fan page
3. Marketing on fan page (with examples)
4. Creating Promotional banner through Canva
5. Face book Promotion using Banners
6. Creating the poll in Face Book fan Page.
7. Face book advertising
8. Best practices for Face book advertising
9. Paymentmodule- CPC vsCPM vsCPA
10. LinkedInMarketing
11. Understanding LinkedIn Company profile.
12. Understanding LinkedIn Individual profiles
13. Understanding LinkedIn groups
14. LinkedIn publishing
15. Twitter Marketing
16. Twitter Advertising
17. Uploading videos on video marketing with thumbnails.
18. YouTube for business.
19. Sending bulk E-Mail.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	1	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Course Code &Title	**24CSVI2102** **WEB DESIGNING LAB** **Credits: 0 + 3**		
Degree Level	**B.Voc**	**Semester**	**III**
Programme:	**B.Voc**. (FP, FTQE, RE, OA&ED, FAD, DPT, FEOM)		
Course Objectives	**The Course aims to** • Introduce the basic concepts of Internet and its terminologies. • Learn the basic structure of HTML tags. • Design static web pages effectively using CSS. • Develop Dynamic web pages using DHTML & XML. • Implement web application using JavaScript & PHP.		
Cognitive Level	**K1-K3**		

Lab Exercises

Write a code using HTML / CSS / XML / JavaScript to the following:

HTML

1. Apply the formatting tags.
2. Implement the different type of List tags.
3. Table and Table formatting tags.
4. Hyperlink creation.
5. Form and Form elements.
6. Frames.

CSS

7. Design text and paragraphs.
8. Tables with different borders styles.

JAVASCRIPT

9. Using variables and operators.
10. Control statements.
11. Validation using functions.
12. Simple questionnaire with validation.
13. Domain-specific application.

Mapping of COs with PSOs:

CO Vs PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	2	2	3	2	3
CO3	3	2	1	3	3
CO4	3	3	3	3	3
CO5	1	3	3	3	3