First Year Syllabus

M.M.S. (Computer Management)

Web Technologies/Computer Applications /Data Analytics

Under

Faculty of Commerce & Management

(Academic Year 2023-24)

Course Assessment & Evaluation Criteria

Components	Weight	Marks Distribution	PerCourse Total Marks
Internal Assessment			**40**
Class Participation and Home Assignments(It can be weekly)	10%	10	
Presentation(assign topics & posters) & Classroom writing Skill	10%	10	
Quizzes & Allied Assignment	10%	10	
Internal Test	10%	10	
External Assessment			**60**
External Exam	60%	60	
Total Marks			**100**

Presentation (Poster or Class Assignment) Rubric

Criteria	Performance(Marks)		
	5	**3**	**1**
Content	The material presented was complete, precise in manner	The material presented was partially complete and was off-topic at some places	The material presented was incomplete and largely off-topic
Knowledge &Understanding	Seminar demonstrated thorough knowledge and applicability of facts, terms and concepts	Seminar demonstrated moderate knowledge and applicability of facts, Terms and concepts	Seminar demonstrated limited knowledge and applicability of facts, terms and concepts
Discussion	The student actively participated in the discussion and was able to give a convincing reply to questions	The student had a moderate participation In the discussion and was able to give a Convincing reply to some questions	The student did not participate in the discussion and was not able to give a convincing reply to most questions

Source:UGC Evaluation Reforms in Higher Educational Institutions

Kavayitri Bahinabai Chadhari North Maharashtra University, Jalgaon

'A' Grade NAAC Re-Accredited (4th Cycle)

FACULTY OF COMMERCE & MANAGEMENT

Structure of

Two Year PG Programme under NEP

M.M.S. (Computer Management)

w.e.f. 2023-24

COURSE STRUCTURE WITH CREDIT

1. TITLE OF THE DEGREE

This degree shall be titled as Master of Management Studies(M.M.S.) in Computer Management. This new curriculum shall be effective from 2023-24.

2. DURATION

The regular Post Graduate Full Time Course shall be of 2 Years duration; comprising of 4 Semesters through Theory papers, Assignments, Case Studies, Paper presentation, Project report, Viva-voce, and such other Continuous Evaluation Systems as may be prescribed, in this respect, from time to time.

3. ELIGIBILITY FOR ADMISSION

The candidate must have passed three years' Bachelor Degree in any discipline or equivalent thereto or as per Eligibility Rules framed by the KBC North Maharashtra University from Time to Time.

4. PATTERN

4.1. English medium is allowed as medium of Instructions for study of subjects.
4.2.Students who selects a particular Major subject from among the 3 options at Sem. I, shall have to continue with the same major at the remaining semesters, namely, Sem. II, Sem. III, and Sem IV.
4.3. One credit for the theory course shall be of the 15 clock hours (Each course being taught in the semester will be of 4 credits) that is each course will be of 60 hours.
4.4. Continuous evaluation of the students shall comprise the 60+40 pattern; where every paper of 100 marks (4 credits), shall be divided as External evaluation of 60 marks and internal continuous assessment of 40 marks.
4.5. The external assessment shall be based on written examination to be conducted by the university at the end of the each semester.
4.6. The student shall not be allowed to appear for the semester examination unless the Head of the Department /Principal of the College certifies completion of internal work, regularity, practical etc. The College shall submit along with this certificate Internal marks to the DEE of the University.
4.7. CGPA system as devised by the University shall be applicable.

5. PASSING STANDARDS

5.1. In order to pass the examination, the candidate has to obtain at least 40% marks for each head separately, that is 24 marks out of 60 (External) and 16 marks out of 40 marks (Internal) for papers of 100 marks
5.2. The student shall be allowed to keep the terms of the next year as per the University rules.

6. PRACTICAL TRAINING THROUGH PROJECT WORK

7.1 In the semester II, III and IV examination student has to do "Project Work" individually on the basis of Internship/major subject. No group work is allowed in this. The topic shall be decided with consultation and guidance of Internal teacher (Project Guide) of the College. The Project shall be necessarily Research oriented, Innovative and Problem solving.

7.2. The college shall submit the detailed list of students with Project Titles, name of the organization, & internal guide to the university before the prescribed date.

7.3. The student has to write a report based on the actual work done during the year at the selected business enterprise, get it certified by the concerned teacher that the Project report has been satisfactorily completed and

submit TWO typed hard bound copies & one soft copy in CD of the same to the Head of the department / Principal of the college.

7.4. One copy of the report submitted by the student shall be forwarded to the University by the College before prescribed date.

7.5 No students will be permitted to appear for Viva-voce examinations, unless and until (s) he submits the project report before the scheduled date.

7.6. Students have to prepare 10-15 minutes presentation based on project work which is mandatory at the time of viva voce.

7. ELIGIBILITY OF THE FACULTY

As per norms fixed by AICTE / UGC, Government of Maharashtra and KBC North Maharashtra University.

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

Structure for Master of Management Studies (Computer Management)

PG Degree Programme as per NEP 2020

Faculty of Computer & Management

Master of Management Studies (Computer Management) – Web Technologies/Computer Applications /Data Analytics

SEMESTER – I

Level (Semester): 6.0 (I)				Credits
VERTICALS		**Course**		
			Select Any One Major Out of Three Choices	**14 Credit**
Major	**Mandatory (DSC)** **DSC-15** **DSC-16** **DSC-17** **DSC-18**	**Web Technologies**	**111A:**Computer Fundamental and Office Automation	4
			112A: Web Designing and Web Authoring Tools	4
			113A: Practical Based on 111A and 112A	4
			114A: Practical Based on 115	2
		Computer Applications	**111B:** Computer Fundamental and Office Automation	4
			112B: Operating System	4
			113B: Practical Based on 111B and 112B	4
			114B: Practical Based on 115	2
		Data Analytics	**111C:** Computer Fundamental and Office Automation	4
			112C: Introduction to Data Analysis	4
			113C: Practical Based on 111C	4
			114C: Practical Based on 115	2
Elective(DSE)		(For all Majors)	**115:** C programming	**4 Credit**
Minor	**Mandatory (Minor)**		-	-
GE/OE	**(**For Student from other Department/Discipline/Faculty**)**		--	--
			Students of Other Discipline/Department or another Faculty will opt this Course	--
VSC, SEC(VSEC)				--
AEC, VEC, IKS				--
RM-1			**116:** Research Methodology	**4 Credit**
Cumulative Credits/ Sem			--	--
Degree/ Cumulative Cr.			--	**22 Credits**

SEMESTER – II

Level (Semester): 6.0 (II)				Credits
VERTICALS		**Course**		
			Select Any One Major Out of Three Choices	**14 Credit**
Major	**Mandatory (DSC)** **DSC-19** **DSC-20** **DSC-21** **DSC-22**	**Web Technologies**	**121A:** Scripting language using Java Script	4
			122A: Advance Web Designing	4
			123A: Practical Based on 121A and 122A	4
			124A: Practical Based on 125	2
		Computer Applications	**121B:** HTML & PHP Language	4
			122B: Communication Skill	4
			123B: Practical Based on 121B and 122B	4
			124B: Practical Based on 125	2
		Data Analytics	**121C:** Advance Excel for Data Analytics	4
			122C: Fundamentals of Big Data and SPSS Software	4
			123C: Practical Based on 121C & 122C	4
			124C: Practical Based on 125	2
Elective(DSE)		(For all Majors)	**125:** C++ Programming	**4 Credit**
Minor	**Mandatory (Minor)**		-	--
GE/OE	**(**For Student from other Department/Discipline/Faculty**)**		--	--
			Students of Other Discipline/Department or another Faculty will opt this Course	--
VSC, SEC(VSEC)				--
AEC, VEC, IKS			--	--
CC, FP, CEP, OJT/Int, RP			**126:** Internship in Industry	**4 Credit**
Cumulative Credits/ Sem			--	**22 Credits**
Degree/ Cumulativee Cr.			--	**44 Credits**
Exit option: PG Diploma (44 Credits) after Two Year PG Degree				

Level(Semester): 6.0(I)

Course No:111A-Computer Fundamental and Office Automation

Course Learning Objectives:

- To prepare the students in understanding ICT basic.
- To enable students in understanding the concepts of input and output devices of computer.
- To enhance capabilities of students in the operating system and its working.
- To acquaint the students with the basic knowledge of word processing, spreadsheet and presentation graphics skills.
- To acquaint the students with the basic knowledge database management skills.

Course Learning Outcomes:

CLO No.	CLO	Cognitive level
111A.1	Student will possess basic knowledge of structure of computer system, various input and output devices, types of memory, applications of computer system.	1
111A.2	Students will possess basic knowledge of operating system, Function of operating system and Types of operating system.	3
111A.3	Students will develop interest in using computers for professional work using software like MS-Word, MS-Excel, MS-PowerPoint and MS-Access.	5

ReferenceBooks:

- Fundamental of Computer by V. Rajaraman, Prentice Hall of India Pvt. Ltd., New Delhi
- Computer Fundamental by Anita Goel, Pearson Education, 2010.
- Computer Fundamental by P. K. Sinha, BPB Publication, New Delhi
- Introduction to computer by Peter Norton.
- Operating System concepts by Abrham Silberschatz,John Wiley & sons INC
- Beginners Guide to Microsoft Word 2015 by Andrew Ford.
- Microsoft 365 Bible.
- Microsoft Office Training Guide by Prof. Satish Jain
- A.S.Tananbaum,"Computer Network"
- VipraComputers,"MicrosoftOffice2015",VipraPrintersPvt. Ltd.
- EdBottandWoodyLeonhard,"SpecialEditionUsingMicrosoftOffice2015"
- MistyVermaat,"MicrosoftOffice2015",ShellyCashman

SessionPlan:

Topics	Readings	No. of Session
Unit 1 - Introduction To Computer System ➢ Introduction to Computer ➢ Characteristics of Computer ➢ Applications of Computer ➢ Computer Architecture ➢ Memory & Its Classification (RAM and ROM, EPROM, EEPROM, Flash Memory) ➢ Input devices, Output Devices	➢ **Reference Text:** • Fundamental of Computer by V. Rajaraman. • Computer Fundamental by Anita Goel. • Computer Fundamental by P. K. Sinha. ➢ **Required Reading** • Fundamental of computer. • Basic input and output device. • Types of computer memories. • Block diagram i.e. architecture of computer system. ➢ **Activity:** • Collect pictures of various parts of computer and write its information. • Describe Computer use in daily life • Handling a mouse and touch action • Type using the keyboard ➢ **Home Assignment**	**10**

Unit 2 - Computer Software And Computer Operating System ➢ Introduction to Software ➢ Types of Software ➢ Computer Virus and Antivirus. ➢ Introduction to Operating System ➢ Function of Operating System ➢ Types of Operating System ➢ GUI vs. CUI	➢ **Reference Text** • Fundamental of Computer by V. Rajaraman. • "Operating System concepts" by AbrhamSilberschatz,John Wiley & sons INC ➢ **Required Reading** • Definition of software and its types. • What is Virus and Antivirus, types of viruses and antiviruses softwares? ➢ **Activity:** • list of different names of viruses. • list of different names of antiviruses. • Manage a computer resources ➢ **Home Assignment**	**10**
Unit 3: Word Processing ➢ Introduction to Office Automation Suites, Components and features ➢ Working with Documents and the Keyboard, Navigating through a Word Document ➢ Basic Text Editing, Text Formatting, Paragraph Formatting, Page Formatting, header & footers, Templates ➢ Working with Graphics and Pictures, Tables, Mail Merge, Printing, spell check, auto text. ➢ Managing bibliography, working with index	➢ **First Internal Test** ➢ **Reference Text:** • Beginners Guide to Microsoft Word 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Word Processing, Basic of formatting, meaning of header and footers. ➢ **Activity:** • Resume Writing with attractive formatting • Letter writing with inserting symbols, Paragraph, page, alignment setting etc. • Creating letters using mail-merge. ➢ **Home Assignment** **First Internal Test**	

Unit 4: Working With Spreadsheet ➢ Introduction to Worksheets and Workbooks, Working with Cells, Rows, and Columns, ➢ Formatting Data and Cells, Formatting Rows and Columns, Editing Cells, Rows, Columns, and Worksheets, Conditional formatting ➢ Formulas and Calculations, inbuilt Functions, Sorting and filtering ➢ Adding Images and Graphics, Charts, Printing Worksheets, Protecting sheets	➢ **Reference Text:** • Beginners Guide to Microsoft Excel 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Spreadsheet, Basic of formulas and functions, meaning of Charts, Sorting, Filtering, etc. ➢ **Activity:** • Developing Mark-sheet. • Developing Payroll. • Create Charts and graphs from data in Excel. • Use Mathematical and logical functions ➢ **Home Assignment**	**10**
Unit 5: Presentation Software ➢ Introduction to Power Point, Basics of Creating Presentations, Applying Themes and Layouts ➢ Working with Objects, Entering, Editing, and Formatting Text, Working in Outline View ➢ Inserting Pictures, Graphics, Shapes, and Other Things, Inserting Tables into Presentations, ➢ Charts and SmartArt, Adding Sound and Video ➢ Adding Transitions and Animation, Master Slides, Printing and Running Slide Shows	➢ **Reference Text:** • Beginners Guide to Microsoft Powerpoint 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Presentation, Basic of slides, Animation, etc. ➢ **Activity:** • Developing interactive Presentation of Courses in College. • Use PowerPoint to Presentation with multimedia elements ➢ **Home Assignment**	

Unit 6: Access Database Management System ➢ Introduction to database ➢ Introduction to Access ➢ Crating tables, forms and reports ➢ Primary Keys and Adding Records	➢ **Second Internal Test:** ➢ **Reference Text:** • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Database Management System, Database, Table, etc. ➢ **Activity:** • Creating a Database. • Creating a Table in Database. • Creating a Form and Report. ➢ **HomeAssignment** ➢ **Second Internal Test**	**10**

Level(Semester): 6.0(I)

CourseNo:112A-Web Designing and Web Authoring Tools

Course Learning Objectives:

- To understand the fundamental concepts of Internet and Networking.
- To prepare students in web designing using various web tools.
- To understand web designing using HTML.
- To enhance capabilities of students in designing the websites.
- To acquaint the students with the basic knowledge of Web Skills.

Course Learning Outcomes:

CLO No.	CLO	Cognitive level
112A.1	Student will possess basic knowledge of internet, various transmission media, different web browsers, websites and types, different types of domains use in web designing.	1
112A.2	Students will possess basic knowledge of developing static webpages using HTML.	3
112A.3	Students will develop interest in developing the website and will be able to design web application / websites.	5

TextBook:HTML 5 and CSS made simple by Ivan Bayross

ReferenceBooks:

- HTML 5 and CSS made simple by Ivan Bayross
- HTML Black Book.
- HTML 5 and CSS 3 for Dummies.
- Responsive Web Design with HTML 5 and CSS by Ben Frain.
- HTML, CSS and JavaScript All in One by Meloni and Kyrin's
- HTML and CSS: Design and Build Websites by Jon Duckett.
- JoelSklar,"TextbookofWebDesigning",CengageLearningPublication2009
- JenniferNiederst,"WebdesigninginNutShell(DesktopQuickReference)",O'Reilly publication

- JamesKalbach,"Designingwebnavigation"byPublication,O'Reillypublication
- "Howtobecomewebmasterin14days",Techmediapublication
- MichaelPalmerandRobertBruceSinclair,Local&WideAreaNetwork,ThomsonPublications
- IvanBayross,"WebEnabledCommercialApplicationDevelopmentusingHTML,DHTML, Java Script, PERL, CGI", BPB Publication
- Fundamental of Computer by V. Rajaraman.

Session Plan:

Topics	Readings	No. of Session
Unit 1: Introduction to Internet ➢ What is Internet, History of Internet, advantages and disadvantages of Internet. ➢ Network Topologies – Meaning, Types - Star, Bus, Ring, Mesh ➢ Routers, Firewall, FTP ISP, TCP/IP ➢ Transmission wire Media: Co- axial Cable, Twisted Pair Cable, Fiber Optics ➢ Wireless Media – Wi-Fi, Bluetooth, Microwave ➢ Types of web sites, Domain types, Different types of Browsers ➢ ISO- OSI seven layer model	➢ **Reference Text:** • Fundamental of Computer by V. Rajaraman. ➢ **Required Reading** • Internet terminologies. • Networking devices. • Types of transmission media. • Different browsers and versions. ➢ **Activity:** • Collect pictures of various network devices and write brief description. • To search different topics on websites ➢ **Home Assignment**	**10**

➢ What is Markup Language? ➢ Basic Structure of HTML. ➢ Head section and Elements of Head Section like Title tag, Meta tag, Script tag, Link tag. ➢ Body tag attributes. ➢ Creating HTML Code in Notepad, Viewing in Browser. ➢ Changing Background with color and images. ➢ Different methods of specifying colors – HTML Color, Hexadecimal Color, R.G.B. Color. ➢ Heading tags. ➢ HTML Tags: Text formatting tags, Marquee tags, Horizontal Ruler tag. ➢ Font tag and Font Attribute.	➢ **Reference Text** • HTML 5 by Ivan Bayross ➢ **Required Reading** • Various web terminologies. • Basics of webpage, website. • Basic concept of Animation ➢ **Activity:** • Creating the list of different editors used for writing HTML code. • Creating the list of different color combination. • Write a simple HTML code on Notepad, save page and display code on web browser ➢ **Home Assignment**	**10**
Unit 3: Working with Images, Links and List ➢ Understanding graphics file formats. ➢ Image tag and attribute. ➢ Link and Types of Links. ➢ Anchor tag and its attributes. ➢ Absolute link and Relative link. ➢ Name Anchor. ➢ List and Types of Lists – Ordered, Unordered and Definition. ➢ Browser compatibility issue.	➢ **First Internal Test** ➢ **Reference Text:** • HTML 5 by Ivan Bayross ➢ **Required Reading** • Understanding meaning of hyperlink and list. ➢ **Activity:** • Make a list of different browser with the inventor companies. • Making a list if different graphics file format that can be used in HTML. • Prepare webpages using list tags, images and link pages. ➢ **Home Assignment** **First Internal Test**	**10**

Unit 4: Working with Tables, Audio and Video ➢ Table – Meaning, ➢ Table tag, Attributes – Border, Width, Height, Cellspacing, Cellpadding, Align ➢ Understanding table elements - <TR>, <TH>, <TD>. ➢ Merging rows and columns. ➢ Formatting table using BGCOLOR, BORDERCOLOR and BACKGROUND attributes. ➢ Caption tag. ➢ Inserting audio in web page. ➢ Inserting video in web page.	➢ **Reference Text:** • HTML 5 by Ivan Bayross ➢ **Required Reading** • Understanding meaning of Cell, Row,Column, Cell-Spacing, Cell-Padding, Merging Rows and Columns, etc. ➢ **Activity:** • Developing webpage using different table formats. • .Understanding different types of audio and video files. ➢ **Home Assignment**	**10**
Unit 5: Planning Site Navigation and frames ➢ Create usable Navigation, Text- Based Navigation, Contextual linking, ➢ Using Graphics for navigation & Linking ➢ Meaning of Frame and Frameset. ➢ Pros and Cons of using Frames. ➢ Working with Frameset - Frameset tag with attributes. ➢ Working with Frame – Frame tag with attributes.	➢ **Reference Text:** • HTML 5 by Ivan Bayross ➢ **Required Reading** • Understanding meaning of Navigation. • Meaning of logical division of browser window. ➢ **Activity:** • Developing webpage with different logical division of browser window. ➢ **Home Assignment**	**10**

Unit 6: Working with Forms ➢ Form - Meaning ➢ FORM tag and its attributes. ➢ GET and POST methods. ➢ Understanding Form Controls. ➢ Creating Form controls like – Textbox, Checkbox, Radio button, Submit button, ➢ Reset button, Password using <INPUT> element. ➢ Creating Multi-line textbox control using <TEXTAREA> element. ➢ Creating Drop-down list control using <SELECT> and <OPTION> element. ➢ Creating Menus.	➢ **Second Interna lTest:** ➢ **Reference Text:** • HTML 5 by Ivan Bayross ➢ **Required Reading** • Understanding meaning of user interface, different controls used for developing user interface, etc. ➢ **Activity:** • Creating a webpage to accept different information using forms. ➢ **Home Assignment** **Second Internal Test**	**10**

Level (Semester): 6.0(I)

Course No: 113A Practical Based on111A-Computer Fundamental and Office Automation and 112A Web Designing and Web Authoring Tools

Course Learning Objectives:

- To prepare the students in understanding ICT basic.
- To enable students in understanding the concepts of input and output devices of computer.
- To enhance capabilities of students in the operating system and its working.
- To acquaint the students with the basic knowledge of word processing, spreadsheet and presentation graphics skills.
- To acquaint the students with the basic knowledge database management skills.
- To understand the fundamental concepts of Internet and Networking.
- To prepare students in web designing using various web tools.
- To understand web designing using HTML.
- To enhance capabilities of students in designing the websites.
- To acquaint the students with the basic knowledge of Web Skills.

Course Learning Outcomes:

CLO No.	CLO	Cognitive level
113A.1	Student will possess basic knowledge of structure of computer system, various input and output devices, types of memory, applications of computer system. Student will possess basic knowledge of internet, various transmission media, different web browsers, websites and types, different types of domains use in web designing.	1
113A.2	Students will possess basic knowledge of operating system, Function of operating system and Types of operating system. Students will possess basic knowledge of developing static webpages using HTML.	3
113A.3	Students will develop interest in using computers for professional work using software like MS-Word, MS-Excel, MS-PowerPoint and MS-Access. Students will develop interest in developing the website and will be able to design web application / websites.	5

Session Plan:

Topics	No. of Session
Practical Based on 111A Computer fundamental and Office Automation 1. Demonstrate style formatting and page formatting in Word Processor 2. Demonstrate creating and using templates in Word Processor 3. Demonstrate working with graphics, pictures, and tables in Word Processor 4. Demonstrate using mail merge with Word Processor 5. Demonstrate entering data, managing data, sorting and formatting data and cells in spreadsheet 6. Demonstrate using formulas and calculations in spreadsheet 7. Demonstrate adding images, graphics, charts and diagrams in spreadsheet 8. Demonstrate creating presentations and applying themes and layouts to slides 9. Demonstrate inserting pictures, graphics, shapes, tables, charts, Smart Art, notes and objects in presentation 10. Demonstrate adding sound, video, transitions, and animation to your Power Point presentations. 11. Create Student database. Insert records using form and generate report	**30**
Practical Based on 112A Web Designing and Web Authoring Tools 1. Develop a webpage using basic HTML tags 2. Develop a web page using Lists 3. Develop webpages using internal and external Hyperlinks 4. Develop a webpage using tables 5. Develop an application form 6. Design a webpage using frames 7. Design a web page using targeted frame 8. Design a web page using video and audio files 9. Design a home page of your college 10. Create simple website with minimum five page and liking pages	**30**

Level(Semester): 6.0(I)

Course No: 114A: Practical Based on 115 C Programming

Course Learning Objectives:

- Understand the basic concepts of C Programming for problem-solving and illustrate the C data types, syntax and constructs.
- Illustrate C for decision making, branching and looping statements.
- Understand the concept of Array and Strings to solve different problems.
- Understand the concept of File handling using C Programming.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
114A.1	Student will possess basic concept about programs, algorithm &Flowcharts	1
114A.2	Students will possess input, output and control flow statements using C Languages.	3
114A.3	Students will possess knowledge of Functions, Array, pointer and Files using C Languages.	5

Session Plan:

Topics	No. of Session
Practical Based on 115: C-Programming **1.** Write a program to find the simple interest. **2.** Write a program in to check the number is palindrome or not. **3.** Write a program to find factorial of given number. **4.** Write a program to print Fibonacci series upto given term. **5.** Write a program to generate all prime numbers in the given range. **6.** Write a program to print given number in word (Ex: - 937 – Nine hundred Thirty Seven). **7.** Write a program to find maximum and minimum of array elements.. **8.** Write a program to check Armstrong number. **9.** Write a program for matrix multiplication. **10.** Write a program to demonstrate string functions. **11.** Write a Program to demonstrate pointer to function. **12.** Write a program to Count the number of words in a given sentence. **13.** Write a Program create a file & store information in it. **14.** Write a Program to copy contents of one file into another file.	**60**

Level(Semester): 6.0(I)

CourseNo:111B-Computer Fundamental and Office Automation

Course Learning Objectives:

- To prepare the students in understanding ICT basic.
- To enable students in understanding the concepts of input and output devices of computer.
- To enhance capabilities of students in the operating system and its working.
- To acquaint the students with the basic knowledge of word processing, spreadsheet and presentation graphics skills.
- To acquaint the students with the basic knowledge database management skills.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
111B.1	Student will possess basic knowledge of structure of computer system, various input and output devices, types of memory, applications of computer system.	1
111B.2	Students will possess basic knowledge of operating system, Function of operating system and Types of operating system.	3
111B.3	Students will develop interest in using computers for professional work using software like MS-Word, MS-Excel, MS-PowerPoint and MS-Access.	5

Reference Books:

- Fundamental of Computer by V. Rajaraman, Prentice Hall of India Pvt. Ltd., New Delhi
- Computer Fundamental by Anita Goel, Pearson Education, 2010.
- Computer Fundamental by P. K. Sinha, BPB Publication, New Delhi
- Introduction to computer by Peter Norton.
- Operating System concepts by AbrhamSilberschatz,John Wiley & sons INC
- Beginners Guide to Microsoft Word 2015 by Andrew Ford.
- Microsoft 365 Bible.
- Microsoft Office Training Guide by Prof. Satish Jain
- A.S.Tananbaum,"ComputerNetwork"
- VipraComputers,"MicrosoftOffice2015",VipraPrintersPvt. Ltd.
- EdBottandWoodyLeonhard,"SpecialEditionUsingMicrosoftOffice2015"
- MistyVermaat,"MicrosoftOffice2015",ShellyCashman

Session Plan:

Topics	Readings	No. of Session
Unit 1 - Introduction To Computer System ➢ Introduction to Computer ➢ Characteristics of Computer ➢ Applications of Computer ➢ Computer Architecture ➢ Memory & Its Classification (RAM and ROM, EPROM, EEPROM, Flash Memory) ➢ Input devices, Output Devices	➢ **ReferenceText:** • Fundamental of Computer by V. Rajaraman. • Computer Fundamental by Anita Goel. • Computer Fundamental by P. K. Sinha. ➢ **Required Reading** • Fundamental of computer. • Basic input and output device. • Types of computer memories. • Block diagram i.e. architecture of computer system. ➢ **Activity:** • Collect pictures of various parts of computer and write its information. • Describe Computer use in daily life • Handling a mouse and touch action • Type using the keyboard ➢ **HomeAssignment**	**10**

Unit 2 - Computer Software And Computer Operating System ➢ Introduction to Software ➢ Types of Software ➢ Computer Virus and Antivirus. ➢ Introduction to Operating System ➢ Function of Operating System ➢ Types of Operating System ➢ GUI vs. CUI	➢ **ReferenceText** • Fundamental of Computer by V. Rajaraman. • "Operating System concepts" by AbrhamSilberschatz,John Wiley & sons INC ➢ **RequiredReading** • Definition of software and its types. • What is Virus and Antivirus, types of viruses and antiviruses softwares? ➢ **Activity:** • list of different names of viruses. • list of different names of antiviruses. • Manage a computer resources ➢ **HomeAssignment**	**10**
Unit 3: Word Processing ➢ Introduction to Office Automation Suites, Components and features ➢ Working with Documents and the Keyboard, Navigating through a Word Document ➢ Basic Text Editing, Text Formatting, Paragraph Formatting, Page Formatting, header & footers, Templates ➢ Working with Graphics and Pictures, Tables, Mail Merge, Printing, spell check, auto text. ➢ Managing bibliography, working with index	➢ **First Internal Test** ➢ **ReferenceText:** • Beginners Guide to Microsoft Word 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **RequiredReading** • Understanding meaning of Word Processing, Basic of formatting, meaning of header and footers. ➢ **Activity:** • Resume Writing with attractive formatting • Letter writing with inserting symbols, Paragraph, page, alignment setting etc. • Creating letters using mail-merge. ➢ **HomeAssignment** **First Internal Test**	

Unit 4: Working With Spreadsheet ➢ Introduction to Worksheets and Workbooks, Working with Cells, Rows, and Columns, ➢ Formatting Data and Cells, Formatting Rows and Columns, Editing Cells, Rows, Columns, and Worksheets, Conditional formatting ➢ Formulas and Calculations, inbuilt Functions, Sorting and filtering ➢ Adding Images and Graphics, Charts, Printing Worksheets, Protecting sheets	➢ **ReferenceText:** • Beginners Guide to Microsoft Excel 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **RequiredReading** • Understanding meaning of Spreadsheet, Basic of formulas and functions, meaning of Charts, Sorting, Filtering, etc. ➢ **Activity:** • Developing Mark-sheet. • Developing Payroll. • Create Charts and graphs from data in Excel. • Use Mathematical and logical functions ➢ **HomeAssignment**	**10**
Unit 5: Presentation Software ➢ Introduction to Power Point, Basics of Creating Presentations, Applying Themes and Layouts ➢ Working with Objects, Entering, Editing, and Formatting Text, Working in Outline View ➢ Inserting Pictures, Graphics, Shapes, and Other Things, Inserting Tables into Presentations, ➢ Charts and SmartArt, Adding Sound and Video ➢ Adding Transitions and Animation, Master Slides, Printing and Running Slide Shows	➢ **ReferenceText:** • Beginners Guide to Microsoft Powerpoint 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **RequiredReading** • Understanding meaning of Presentation, Basic of slides, Animation, etc. ➢ **Activity:** • Developing interactive Presentationof Courses in College. • Use PowerPoint to Presentation with multimedia elements ➢ **HomeAssignment**	

Unit 6: Access Database Management System ➢ Introduction to database ➢ Introduction to Access ➢ Crating tables, forms and reports ➢ Primary Keys and Adding Records	➢ **SecondInternalTest:** ➢ **ReferenceText:** • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **RequiredReading** • Understanding meaning of Database Management System, Database, Table, etc. ➢ **Activity:** • Creating a Database. • Creating a Table in Database. • Creating a Form and Report. ➢ **HomeAssignment** ➢ **Second Internal Test**	**10**

Level (Semester): 6.0(I)
Course No:112B-Operating System

Course Learning Objectives:

- To acquaint the students with the scientific and history of operating system.
- To enable students to develop their various operating system knowledge.
- To enhance operating system programming.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
112B.1	Demonstrate proficiency in handling the various operating system.	1
112B.2	Develop the skill to write down the operating system programs.	3
112B.3	Develop the knowledge of file structure in operating system.	5

REFERENCE BOOKS:

- Mccallister, Suse Linus-10, Pearson Education, 2006.
- Ball, Using Linux, PHI, 1998.
- Das, Unix: Concepts And Applications (4th Ed), TMH, 2006.
- Foster Johnson, Welch, Anderson, Beginning Shell Scripting, Wiley India (Wrox), 2006.
- Neil Mathew, Richard Stones, Beginning Linux Programming (3rd Ed), Wiley India (Wrox), 2006.
- Peterson, Linux: Complete Reference (5th Ed), Peterson, TMH.

Session Plan:

Topics	Readings	No. of Session
Unit 1 : History And Development Of Linux ➢ Introduction of Operating System. ➢ Functions of Operating System ➢ Introduction to DOS, Windows, Linux ➢ A Brief History Of Linux ➢ Benefits Of Linux ➢ Acquiring And Using Linux ➢ Examining Linux Distributions. ➢ File System Navigation ➢ Managing The File System ➢ Difference between Windows and Linux	➢ **Reference Text:** Mccallister, Suse Linus-10, Pearson Education, 2006 ➢ **Required Reading** Fundamentals of operating system. ➢ **Case:** Study the different operating systems. ➢ **Home Assignment:** Study of android, ios system .	**10**
UNIT 2: Linux Commands ➢ Ls, date, cp, rm, mv, mkdir, cat, cut, paste, chdir, rmdir, date, head, tail, echo, kill, pwd, chown, chmod, grep, fgrep, mail, mesg, write, tee, test, sleep, passwd, touch, clear, more, sort, zip, gzip, man, less, who, who am I, ps, wc, clear, exit, break, shutdown, read, expr ➢ Understanding Permissions ➢ Changing File And Directory Permissions ➢ Changing Default Permissions And Ownership	➢ **Reference Text** Foster Johnson, Welch, Anderson, Beginning Shell Scripting, Wiley India (Wrox) ➢ **Required Reading** Use of each command in linux ➢ **Case:** Understanding the file and directory permissions ➢ **Home Assignment/Flipped Classroom:** Study the default permissions of file and directory **First Internal Test:**	**10**

UNIT 3: Shell Programming ➢ Introduction to shell feature, ➢ wild card characters, ➢ i/out redirections, ➢ standard error redirection, ➢ system and user created shell variables, ➢ profile files, pipes/tee, ➢ background processing, ➢ command line arguments, command substitution, ➢ read statement, ➢ conditional execution of commands, ➢ special shell variables $ #, #?, $* etc. ➢ Shift commands, ➢ loops and decision making- for, while and until, choice making using case.,.esac, decision making if ….fi, using test, string comparison, numerical comparison, logical operation, using expr.	➢ **Reference Text** Foster Johnson, Welch, Anderson, Beginning Shell Scripting, Wiley India (Wrox) ➢ **Required Reading:** How to declare the variable and use the variable. ➢ **Case:** Perform basic programming using various statements. ➢ **Home Assignment/Flipped Classroom:** Compare various looping and decision making statements.	**15**
UNIT 4: Working with user and editor ➢ Creating Additional User Accounts ➢ Creating & Managing Groups ➢ Managing Users. ➢ Using The Vi Editor ➢ Using Other Editors ➢ Examining File Contents ➢ Redirection.	➢ **Reference Text:** Mccallister, Suse Linus-10, Pearson Education, 2006 ➢ **Required Reading:** Types of users in operating system. ➢ **Case:** Use of editors in operating system ➢ **Home Assignment/Quiz:** Compare the various editors in linux operating system	**10**

UNIT 5: Working In X Windows ➢ Introduction To X Windows And GNOME ➢ Managing Files And File Systems ➢ Customizing X Windows ➢ Choosing And Changing Window Managers And Desktops Remote X Window Access,	➢ **Reference Text:** Peterson, Linux: Complete Reference (5th Ed), Peterson, TMH ➢ **Required Reading:** Windows and its features ➢ **Case:** Check the use of various window managers available with X windows ➢ **Home Assignment/Flipped Classroom:** Check and compare the various X window Managers available in linux	**10**
UNIT 6: Archiving Files ➢ Archiving Files With Tar ➢ Archiving Files With CPIO ➢ Archiving Files With Other Utilities ➢ Zipping Files	➢ **Second Internal Test:** ➢ **Internal Project based on entire Course:**	**5**

Level(Semester): 6.0(I)

CourseNo:113B Practical Based on111B-Computer Fundamental and Office Automation and 112B Operating System

Course Learning Objectives:

- To prepare the students in understanding ICT basic.
- To enable students in understanding the concepts of input and output devices of computer.
- To enhance capabilities of students in the operating system and its working.
- To acquaint the students with the basic knowledge of word processing, spreadsheet and presentation graphics skills.
- To acquaint the students with the basic knowledge database management skills.
- To understand the fundamental concepts of Internet and Networking.
- To prepare students in web designing using various web tools.
- To understand web designing using HTML.
- To enhance capabilities of students in designing the websites.
- To acquaint the students with the basic knowledge of Web Skills.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
113B.1	Student will possess basic knowledge of structure of computer system, various input and output devices, types of memory, applications of computer system. Student will possess basic knowledge of internet, various transmission media, different web browsers, websites and types, different types of domains use in web designing.	1
113B.2	Students will possess basic knowledge of operating system, Function of operating system and Types of operating system. Students will possess basic knowledge of developing static webpages using HTML.	3
113B.3	Students will develop interest in using computers for professional work using software like MS-Word, MS-Excel, MS-PowerPoint and MS-Access. Students will develop interest in developing the website and will be able to design web application / websites.	5

Session Plan:

Topics	No. of Session
Practical Based on 111B Computer fundamental and Office Automation 1. Demonstrate style formatting and page formatting in Word Processor 2. Demonstrate creating and using templates in Word Processor 3. Demonstrate working with graphics, pictures, and tables in Word Processor 4. Demonstrate using mail merge with Word Processor 5. Demonstrate entering data, managing data, sorting and formatting data and cells in spread sheet 6. Demonstrate using formulas and calculations in spreadsheet 7. Demonstrate adding images, graphics, charts and diagrams in spread sheet 8. Demonstrate creating presentations and applying theme and layouts to slides 9. Demonstrate inserting pictures, graphics, shapes, tables, charts, Smart Art, notes and objects in presentation 10. Demonstrate adding sound, video, transitions, and animation to your PowerPoint presentations. 11. Create Student database. Insert records using form and generate report	**30**
Practical Based on 112B OPERATING SYSTEM 1. Demonstration of Linux commands related to file and directory command with attributes such as cat, mkdir, rm, rmdir, ls 2. Demonstration of Linux commands such as wc, who, who am i, head, tail, grep, cut, paste 3. Demonstration of Linux commands related to file permission (Chmod) 4. Demonstrate of Linux command related to Archiving Files: Archiving Files with tar 5. Demonstration of User and group related commands 6. Write a shell script to calculate factorial of a number 7. Write a shell script to display first 20 terms of Fibonacci series. 8. Write a shell script to display current time of system and display the message according to the time. 9. Write a shell script to check the user is login or not and say hello. 10. Write a shell script to check the number is prime or not. 11. Write a shell script to create result sheet	**30**

Level(Semester): 6.0(I)

Course No: 114B: Practical Based on 115 C Programming

Course Learning Objectives:

- Understand the basic concepts of C Programming for problem-solving and illustrate the C data types, syntax and constructs.
- Illustrate C for decision making, branching and looping statements.
- Understand the concept of Array and Strings to solve different problems.
- Understand the concept of File handling using C Programming.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
114B.1	Student will possess basic concept about programs, algorithm &Flowcharts	1
114B.2	Students will possess input, output and control flow statements using C Languages.	3
114B.3	Students will possess knowledge of Functions, Array, pointer and Files using C Languages.	5

Session Plan:

Topics	No. of Session
Practical Based on 115: C-Programming **1.** Write a program to find the simple interest. **2.** Write a program in to check the number is palindrome or not. **3.** Write a program to find factorial of given number. **4.** Write a program to print Fibonacci series upto given term. **5.** Write a program to generate all prime numbers in the given range. **6.** Write a program to print given number in word (Ex: - 937 – Nine hundred Thirty Seven). **7.** Write a program to find maximum and minimum of array elements.. **8.** Write a program to check Armstrong number. **9.** Write a program for matrix multiplication. **10.** Write a program to demonstrate string functions. **11.** Write a Program to demonstrate pointer to function. **12.** Write a program to Count the number of words in a given sentence. **13.** Write a Program create a file & store information in it. **14.** Write a Program to copy contents of one file into another file.	**60**

Level (Semester): 6.0 (I)

Course No: 111C- Computer Fundamental and Office Automation

Course Learning Objectives:

- To prepare the students in understanding ICT basic.
- To enable students in understanding the concepts of input and output devices of computer.
- To enhance capabilities of students in the operating system and its working.
- To acquaint the students with the basic knowledge of word processing, spreadsheet and presentation graphics skills.
- To acquaint the students with the basic knowledge database management skills.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
111C.1	Student will possess basic knowledge of structure of computer system, various input and output devices, types of memory, applications of computer system.	1
111C.2	Students will possess basic knowledge of operating system, Function of operating system and Types of operating system.	3
111C.3	Students will develop interest in using computers for professional work using software like MS-Word, MS-Excel, MS-PowerPoint and MS-Access.	5

Reference Books:

- Fundamental of Computer by V. Rajaraman, Prentice Hall of India Pvt. Ltd., New Delhi
- Computer Fundamental by Anita Goel, Pearson Education, 2010.
- Computer Fundamental by P. K. Sinha, BPB Publication, New Delhi
- Introduction to computer by Peter Norton.
- Operating System concepts by Abrham Silberschatz, John Wiley & sons INC
- Beginners Guide to Microsoft Word 2015 by Andrew Ford.
- Microsoft 365 Bible.
- Microsoft Office Training Guide by Prof. Satish Jain
- A. S.Tananbaum, "Computer Network"
- Vipra Computers, "Microsoft Office 2015", Vipra Printers Pvt. Ltd.
- Ed Bott and Woody Leonhard, "Special Edition Using Microsoft Office 2015"
- Misty Vermaat, "Microsoft Office 2015", Shelly Cashman

Session Plan :

Topics	Readings	No. of Session
Unit 1 - Introduction To Computer System ➢ Introduction to Computer ➢ Characteristics of Computer ➢ Applications of Computer ➢ Computer Architecture ➢ Memory & Its Classification (RAM and ROM, EPROM, EEPROM, Flash Memory) ➢ Input devices, Output Devices	➢ **Reference Text:** • Fundamental of Computer by V. Rajaraman. • Computer Fundamental by Anita Goel. • Computer Fundamental by P. K. Sinha. ➢ **Required Reading** • Fundamental of computer. • Basic input and output device. • Types of computer memories. • Block diagram i.e. architecture of computer system. ➢ **Activity:** • Collect pictures of various parts of computer and write its information. • Describe Computer use in daily life • Handling a mouse and touch action • Type using the keyboard ➢ **Home Assignment**	**10**

Unit 2 - Computer Software And Computer Operating System ➢ Introduction to Software ➢ Types of Software ➢ Computer Virus and Antivirus. ➢ Introduction to Operating System ➢ Function of Operating System ➢ Types of Operating System ➢ GUI vs. CUI	➢ **Reference Text** • Fundamental of Computer by V. Rajaraman. • "Operating System concepts" by Abrham Silberschatz, John Wiley & sons INC ➢ **Required Reading** • Definition of software and its types. • What is Virus and Antivirus, types of viruses and antiviruses softwares? ➢ **Activity:** • list of different names of viruses. • list of different names of antiviruses. • Manage a computer resources ➢ **Home Assignment**	**10**
Unit 3: Word Processing ➢ Introduction to Office Automation Suites, Components and features ➢ Working with Documents and the Keyboard, Navigating through a Word Document ➢ Basic Text Editing, Text Formatting, Paragraph Formatting, Page Formatting, header & footers, Templates ➢ Working with Graphics and Pictures, Tables, Mail Merge, Printing, spell check, auto text. ➢ Managing bibliography, working with index	➢ **First Internal Test** ➢ **Reference Text:** • Beginners Guide to Microsoft Word 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Word Processing, Basic of formatting, meaning of header and footers. ➢ **Activity:** • Resume Writing with attractive formatting • Letter writing with inserting symbols, Paragraph, page, alignment setting etc. • Creating letters using mail-merge. ➢ **Home Assignment** **First Internal Test**	

Unit 4: Working With Spreadsheet ➢ Introduction to Worksheets and Workbooks, Working with Cells, Rows, and Columns, ➢ Formatting Data and Cells, Formatting Rows and Columns, Editing Cells, Rows, Columns, and Worksheets, Conditional formatting ➢ Formulas and Calculations, inbuilt Functions, Sorting and filtering ➢ Adding Images and Graphics, Charts, Printing Worksheets, Protecting sheets	➢ **Reference Text:** • Beginners Guide to Microsoft Excel 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Spreadsheet, Basic of formulas and functions, meaning of Charts, Sorting, Filtering, etc. ➢ **Activity:** • Developing Mark-sheet. • Developing Payroll. • Create Charts and graphs from data in Excel. • Use Mathematical and logical functions ➢ **Home Assignment**	**10**
Unit 5: Presentation Software ➢ Introduction to Power Point, Basics of Creating Presentations, Applying Themes and Layouts ➢ Working with Objects, Entering, Editing, and Formatting Text, Working in Outline View ➢ Inserting Pictures, Graphics, Shapes, and Other Things, Inserting Tables into Presentations, ➢ Charts and SmartArt, Adding Sound and Video ➢ Adding Transitions and Animation, Master Slides, Printing and Running Slide Shows	➢ **Reference Text:** • Beginners Guide to Microsoft Powerpoint 2015 by Andrew Ford. • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Presentation, Basic of slides, Animation, etc. ➢ **Activity:** • Developing interactive Presentation of Courses in College. • Use PowerPoint to Presentation with multimedia elements ➢ **Home Assignment**	

Unit 6: Access Database Management System ➢ Introduction to database ➢ Introduction to Access ➢ Crating tables, forms and reports ➢ Primary Keys and Adding Records	**Second Internal Test:** ➢ **Reference Text:** • Microsoft 365 Bible. • Microsoft Office Training Guide by Prof. Satish Jain. ➢ **Required Reading** • Understanding meaning of Database Management System, Database, Table, etc. ➢ **Activity:** • Creating a Database. • Creating a Table in Database. • Creating a Form and Report. ➢ **Home Assignment** ➢ **Second Internal Test**	**10**

Level (Semester): 6.0 (I)

Course No: 112C- Introduction to Data Analysis

Course Learning Objectives:

- To introduce Data Analytics and it's applications to students.
- To aware students about process & types of Data Analytics.
- To introduce the basic concept of data management and data mining techniques.
- To aware students about the role of Data Analyst and Data Science in business.
- To understand the basic concept of machine learning.
- To introduce data analytics tools and data visualization.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
112C.1	Student will possess basic knowledge of Data Analytics, Data science and applications of data analytics, process and types of Data Analytics.	1
112C.2	Students will possess basic knowledge of data science project life cycle, methods and the role of Data Analyst and Data Science in business, concept of data management and data mining techniques.	3
112C.3	Students will come to know the basic concept of machine learning for data analytics, various tools for data analytics and basics of data visualization.	5

Reference Books:

- Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, Sridhar Seshadri, Springer.
- Introduction to Machine Learning with Python: A Guide for Data Scientists 1st Edition, by Andreas C. Müller, Sarah Guido, O'Reilly.
- Introduction to Data Science, Laura Igual Santi Seguí, Springer
- Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education India
- An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019
- geeksforgeeks.org/data-analysis-tutorial
- https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn
- https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm

Session Plan :

Topics	Readings	No. of Session
Unit 1 - Introduction to Data Analytics • Introduction: What is Data analytics? • Historical Overview of data analytics. • Data Scientist vs. Data Engineer vs. Business Analyst. • What is data science, Why Data Science? • Applications for data analytics. Data Scientist's Roles and Responsibility.	**Reference Text:** • Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, Sridhar Seshadri, Springer. • An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019 • geeksforgeeks.org/data-analysis-tutorial • https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn • https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm **Required Reading** • Data analytics? • Business Analyst • Data science • Applications for data analytics **Activity:** Collect information about Data Analytics, Data Science – use and applications Describe applications List out the roles of Data Analyst. **Home Assignment**	**10**

Unit 2 - Data Analytics Process ➢ Data Collection, Data Management, Big Data Management. ➢ Organization /sources of data, Importance of data quality. ➢ Dealing with missing or incomplete data. ➢ Quantitative and qualitative data. ➢ Data Analytics Process. ➢ Types of Data Analytics. ➢ Data Classification, Data Visualization.	**Reference Text** • Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, Sridhar Seshadri, Springer. • An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019 • geeksforgeeks.org/data-analysis-tutorial • https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn • https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm **Required Reading** • Data Collection, Big Data Management • Sources of data, Importance of data quality. • Quantitative and qualitative data. • Data Analytics Process • Types of Data Analytics **Activity:** • For your college, follow all the data analytics process & classify the data.	**10**

Unit 3: Data Science Project Life Cycle and Data Mining Techniques ➢ Business Requirement. ➢ Data Acquisition, Data Preparation, Hypothesis and Modelling. ➢ Evaluation and Interpretation, Deployment, Operations, Optimization. ➢ Data Analytics methods. ➢ Introduction to Data Mining. ➢ OLAP and Multidimensional data analytics. ➢ Association Analytics and Cluster Analytics.	**First Internal Test** **Reference Text:** ➢ Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, SridharSeshadri, Springer. ➢ Introduction to Data Science, Laura Igual Santi Seguí, Springer ➢ Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education India ➢ An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019 ➢ geeksforgeeks.org/data-analysis-tutorial ➢ https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn ➢ https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm **Required Reading** • Data Science Project Life Cycle • Data Mining Techniques **Activity:** • For your college, follow the phases of Project life cycle • Identify suitable technique for Data Mining. **Home Assignment** **First Internal Test**	**10**

Unit 4: Introduction of Machine Learning for data Analytics ➢ Introduction to Machine Learning: History and Evolution ➢ Data Mining Vs Data Analytics ➢ Introduction of Supervised Learning ➢ Introduction of Unsupervised Learning ➢ Introduction of Reinforcement Learning	**Reference Text:** ➢ Introduction to Machine Learning with Python: A Guide for Data Scientists 1st Edition, by Andreas C. Müller, Sarah Guido, O'Reilly. ➢ Introduction to Data Science, Laura Igual Santi Seguí, Springer ➢ An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019 ➢ geeksforgeeks.org/data-analysis-tutorial ➢ https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn ➢ https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm **Required Reading** • Machine Learning, Data Mining, • Data Analytics **Activity:** • Study the use of Machine Learning for Data Analytics **Home Assignment**	**10**
Unit 5: Introduction of Data Analytics Tools ➢ Microsoft Excel 2010 ➢ Python Programming ➢ R Programming ➢ Jupiter Notebook ➢ Apache Spark ➢ SAS ➢ Microsoft Power BI	**Reference Text:** ➢ Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, Sridhar Seshadri, Springer. ➢ Introduction to Data Science, Laura Igual Santi Seguí, Springer ➢ An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019 ➢ geeksforgeeks.org/data-analysis-tutorial ➢ https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn ➢ https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm **Required Reading** • Basic information of various Data Analytics Tools **Activity:** • Identify suitable tool for Data Analysis of your college data **Home Assignment**	**10**

Unit 6: Introduction Data Visualization ➢ Data visualization ➢ Advantages and disadvantages of data visualization ➢ Importance of data visualization ➢ Data visualization and big data ➢ Data visualization Vs Data Analytics ➢ Data visualization examples	**Second Internal Test:** **Reference Text:** ➢ Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, Sridhar Seshadri, Springer. ➢ Introduction to Data Science, Laura Igual Santi Seguí, Springer ➢ An Introduction to Business Analytics, Ger Koole, Lulu.com, 2019 ➢ geeksforgeeks.org/data-analysis-tutorial ➢ https://www.youtube.com/watch?v=dPUiCk-FjaE&ab_channel=Simplilearn ➢ https://www.tutorialspoint.com/excel_data_analysis/data_analysis_overview.htm **Required Reading** • Understanding of Data Visualization • Importance of Data Visualization **Activity:** • Identify examples for data visualization **Home Assignment** • **Second Internal Test**	**10**

Level (Semester): 6.0 (I)

Course No: 113C Practical Based on

111C- Computer Fundamental and Office Automation

Course Learning Objectives:

- To prepare the students in understanding ICT basic.
- To enable students in understanding the concepts of memory, input and output devices of computer.
- To enhance capabilities of students in the operating system and its working.
- To acquaint the students with the basic knowledge of word processing software.
- To acquaint the students with the basic knowledge of spreadsheet software.
- To acquaint the students with the basic knowledge of presentation software.
- To acquaint the students with the basic knowledge database management skills.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
113C.1	Student will possess basic knowledge of structure of computer system, various input and output devices, types of memory, applications of computer system.	1
113C.2	Students will possess basic knowledge of operating system, Function of operating system and Types of operating system.	3
113C.3	Students will develop interest in using computers for professional work using software like MS-Word, MS-Excel, MS-PowerPoint and MS-Access.	5

Session Plan:

Topics	No. of Session
Practical Based on 111C Computer fundamental and Office Automation 1. Demonstrate style formatting and page formatting in Word Processor 2. Demonstrate creating and using templates in Word Processor 3. Demonstrate working with graphics, pictures, and tables in Word Processor 4. Demonstrate using mail merge with Word Processor 5. Demonstrate entering data, managing data, sorting and formatting data and cells in spreadsheet 6. Demonstrate using formulas and calculations in spreadsheet 7. Demonstrate adding images, graphics, charts and diagrams in spreadsheet 8. Demonstrate creating presentations and applying themes and layouts to slides 9. Demonstrate inserting pictures, graphics, shapes, tables, charts, Smart Art, notes and objects in presentation 10. Demonstrate adding sound, video, transitions, and animation to your PowerPoint presentations. 11. Create Student database. Insert records using form and generate report. 12. Perform Data Visualization activity using any suitable tool 13. Install and demonstrate use of PSPP as Data Analysis tool	**60**

Level(Semester): 6.0(I)

Course No: 114C: Practical Based on 115 C Programming

Course Learning Objectives:

- Understand the basic concepts of C Programming for problem-solving and illustrate the C data types, syntax and constructs.
- Illustrate C for decision making, branching and looping statements.
- Understand the concept of Array and Strings to solve different problems.
- Understand the concept of File handling using C Programming.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
114C.1	Student will possess basic concept about programs, algorithm &Flowcharts	1
114C.2	Students will possess input, output and control flow statements using C Languages.	3
114C.3	Students will possess knowledge of Functions, Array, pointer and Files using C Languages.	5

Session Plan:

Topics	No. of Session
Practical Based on 115: C-Programming **1.** Write a program to find the simple interest. **2.** Write a program in to check the number is palindrome or not. **3.** Write a program to find factorial of given number. **4.** Write a program to print Fibonacci series upto given term. **5.** Write a program to generate all prime numbers in the given range. **6.** Write a program to print given number in word (Ex: - 937 – Nine hundred Thirty Seven). **7.** Write a program to find maximum and minimum of array elements.. **8.** Write a program to check Armstrong number. **9.** Write a program for matrix multiplication. **10.** Write a program to demonstrate string functions. **11.** Write a Program to demonstrate pointer to function. **12.** Write a program to Count the number of words in a given sentence. **13.** Write a Program create a file & store information in it. **14.** Write a Program to copy contents of one file into another file.	**60**

Level(Semester): 6.0(I)

CourseNo:115 C programming

Course Learning Objectives:

- To understand the foundational concepts and applications of C programming language, including its historical development and significance.
- To learn structured programming and control flow structures (if-else, switch, loops) for efficient program control and decision-making.
- To master input-output operations, including standard input-output functions and formatted input-output statements, for effective data handling.
- To gain proficiency in working with arrays, strings, and pointers, enabling efficient data manipulation and memory management.
- To comprehend the importance of structures, unions, and file handling in C programming, and utilize them to store and retrieve data from files.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
115.1	Students will be able to apply their understanding of C programming concepts, including structured programming, control flow, functions, arrays, strings, and pointers, to analyze problems and develop efficient C programs.	3
115.2	Students will assess the significance of file handling in C programming and demonstrate the ability to read from and write to files. They will critically evaluate data manipulation techniques using file I/O operations, demonstrating a high-level understanding of C programming constructs.	4
115.3	Students will synthesize their knowledge of advanced C programming concepts, such as recursion, structures, unions, and dynamic memory allocation, to design complex algorithms and develop sophisticated C programs. They will demonstrate creativity and innovation in problem-solving with C programming.	5

Reference Books:

- ANSI C by Yashwant P. Kanetkar - ISBN: 9788183333245
- Programming with C by Byron Gottfried - ISBN: 0070145903
- Understanding Pointers in C by Yashwant P. Kanetkar - ISBN: 978-8176563581
- Programming in ANSI-C by E. Balguruswami - ISBN: 9339219678
- C Programming: A Modern Approach by K. N. King - ISBN: 0393979504
- The C Programming Language by Brian W. Kernighan and Dennis M. Ritchie - ISBN: 0131103628
- C Programming Absolute Beginner's Guide by Perry, Miller, and Qualls - ISBN: 0789751984
- Head First C by David Griffiths and Dawn Griffiths - ISBN: 1449399916
- C Primer Plus by Stephen Prata - ISBN: 0321928423
- Pointers in C: A Hands-On Approach by HrishikeshDewan and Naveen Toppo - ISBN: 9389845427
- C Programming for the Absolute Beginner by Vine, Vine, and Watkinson - ISBN: 1598632824
- C Programming: From Problem Analysis to Program Design by D. S. Malik - ISBN: 1337102083
- C Programming Language by Darrel L. Graham - ISBN: 0070146896
- C: The Complete Reference by Herbert Schildt - ISBN: 0072121246

Session Plan:

Topics	Readings / Activity	No. of Session
UNIT 1: Introduction • History of C Programming language • Applications and Features • Concept of Structured Programming • Structure of C-program • Definitions- Program, Interpreter, Compiler • Algorithm: Basic notation of algorithm • Flowcharts: Definition, Symbols of flow charts • Examples of algorithms and flowcharts	**Readings Ref. -** ➢ C Programming: A Modern Approach ➢ "The C Programming Language" ➢ "C Programming Absolute Beginner's Guide" ➢ "Head First C" ➢ "C Primer Plus" **Activity-** Algorithm Design and Flowchart Creation	**10**
UNIT 2: Input-Output and Control Flow ➢ Variable name and data types. ➢ Operators and expressions: Arithmetic operators, Relational operators, Logical operators, Increment and decrement operators, Assignment operators, Compound assignment operators, Conditional expression, Precedence and order of evaluation. ➢ Standard input-output and formatted input-output statements.	**Readings Ref. -** ➢ ANSI C ➢ Programming in ANSI-C ➢ C Programming: A Modern Approach ➢ C: The Complete Reference **Activity-** Implement a program that takes input from the user and calculates the factorial of a given number using a for loop	**10**

➢ Control flow: Statement and block, if-else-if statements, switch statement, break and continue statements, goto statement, Loops: while loop, for loop, do-while loop, nesting of loops	➢ **First Internal Test**	
UNIT 3: Functions • Basics of functions: declaring, calling, and defining functions, call by value & call by reference, scope of the variable • Recursion: understanding and implementing recursive functions. • String functions: working with string manipulation and processing functions.	**Readings Ref. -** ➢ ANSI C ➢ C Programming: A Modern Approach ➢ The C Programming Language ➢ C Primer Plus **Activity-** Practice implementing a recursive function to calculate the factorial of a given positive integer.	**10**
UNIT 4: Arrays, Strings and Pointers • Arrays - Introduction to Arrays, Declaration and Initialization of Arrays, Accessing Array Elements, One-Dimensional Arrays, Multidimensional Arrays, Advantages and disadvantages of using Arrays • Strings - Introduction to Strings, Declaration and Initialization of Strings, String Manipulation Functions in the Standard Library: strlen(), strcpy(), strcat(), strcmp(), etc. • Pointers - Introduction to Pointers, Declaration and Initialization of Pointers, Operations on Pointers: Pointer Arithmetic, Array of Pointers, Function and Pointers, Pointer to Pointer	**Readings Ref. -** ➢ ANSI C ➢ C Programming: A Modern Approach ➢ The C Programming Language ➢ Understanding Pointers in C **Activity-** Practice implementing a function that uses pointers to reverse a given string.	**10**
UNIT 5: Introduction to Structure and Union • Similarities and differences between structures and unions • Importance of structures and unions in C programming • Structure Basics - Declaring a structure, Accessing structure members, Initializing structure variables, Nested structures • Union - Understanding unions and their purpose, Declaring unions and accessing members	**Readings Ref. -** ➢ ANSI C ➢ C Programming: A Modern Approach ➢ The C Programming Language ➢ C Primer Plus **Activity-** Create a C program that defines both a structure and a union representing a student record.	**10**

UNIT 6: File Handling • Importance of file handling in programming • Using the fopen() function • Different modes of file opening (r, w, a, etc.) • Using the fclose() function • Importance of closing files properly • Using the fscanf() and fgets() functions • Using the fprintf() and fputs() functions • Appending data to an existing file	**Activity-** Create a program that opens a text file in write mode (w) and allows the user to enter multiple lines of text. Each line should be written to the file using the fprintf() or fputs() function. ➢ **Second Internal Test**	**10**

Level (Semester): 6.0(I)

CourseNo:116-Research Methodology in Commerce and Management

Course Learning Objectives:

- To acquaint the students with the scientific method of research for decision making in business.
- To enable students to formulate the research problem, develop the research hypotheses, and understand the major research designs and data sampling techniques.
- To enhance capabilities of students in developing the most appropriate methodology for their research and to conduct the research in the field of business and social sciences.
- To develop effective communication skills to present research findings and recommendations to diverse business audiences and draw meaningful conclusions.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
116.1	Demonstrate proficiency in conducting business research by identifying the research gap, problem identification, building the questionnaires, data collection, and sampling, using appropriate research methodologies and techniques.	1
116.2	Develop strong analytical and critical thinking skills, enabling them to apply appropriate data analysis techniques to evaluate and analyze the data, and draw meaningful conclusions based on research findings	3
116.3	Develop effective communication skills to present research findings and recommendations to diverse business audiences, utilizing clear and concise language, visual aids, and persuasive arguments.	5

TextBook:

ResearchMethodology–
MethodsandTechniquesbyC.R.Kothari,NewAgeInternationalPublishers,New Delhi.

ReferenceBooks:

- ResearchMethodologybyDipakKumarBhattacharyya,ExcelBooks,NewDelhi
- ResearchMethodsandTechniquesbyAnilKumar Gupta,ValueEducationof India,NewDelhi
- Research Methodology-Concepts and Cases by Deepak Chawla & Neena Sondhi, VikasPublishingHousePvt.Ltd., New Delhi
- ResearchMethods byRamAhuja, Rawat Publications, Jaipur
- MethodologyandTechniques ofSocialResearchbyP.L.Bhandarkar, T.S.Wilkison&D.K.Laldas,HimalayaPublishingHouse, Mumbai.
- LegalResearchandWritingMethodsbyAnwarulYaqin,LexisNexisButterworths,Nagpur
- BusinessResearchMethods byDonald R.Cooper &PamelaS. Schindler, Tata McGraw-HillEdition,New Delhi.
- InvestigatingtheSocialWorld-TheProcessand PracticeofResearchbyRussellK.Schutt,SagePublication,New Delhi
- BusinessResearchMethodsbyAlanBryman&EmmaBell,Oxford UniversityPress,New York

SessionPlan:

Topics	Readings	No. of Session
Unit1- Introduction to Research Methodology ➢ Introduction, Definition, Objectives, Significance ➢ Types of Research, Research Approaches ➢ Features of a Good Research, Steps in Scientific Research Process ➢ Research Methods versus Methodology, Research and Scientific method ➢ Research Process–An overview ➢ Literature Survey, research gap finding and documentation	➢ **ReferenceText:** "Handbook of Research Methodology by Dr. Shanti Bhushan Mishra and Dr. Shashi Alok, Educreation Publishing." **Required Reading** Fundamentals of Research, Literature Survey & Documentation **Case:** Perform literature survey related to field of specialization and find the research gap ➢ **HomeAssignment:** Study literature survey done by few researchers and way of its Documentation.	**10**

Unit2-Formulation of the Research Problem and Research Design ➢ **Research Problem:** Defining the Research Problem, Techniques involved in defining research problem ➢ **Hypotheses:** Meaning, definition, and types of Hypothesis, Formulation of the Hypotheses ➢ **Research Design:** Meaning, Nature and Classification of Research Design, Need for Research Design, Phases/Steps in Research Design **Questionnaire:** Concept of Questionnaire and Schedule, Principles of Designing Questionnaire and Schedule, Limitations of Questionnaire, Reliability & Validity of Questionnaire	➢ **Reference Text** Research Methodology – A step bystep guide for beginners by RanjitKumar, SagePublications ➢ **Required Reading** Formulating a research problem, constructing hypotheses, research design, constructing an instrument for data collection ➢ **Case:** ➢ Write the research problem, formulate hypotheses, and construct the instrument for data collection. ➢ **Home Assignment / Flipped Classroom:** Differentiate between Questionnaire and Schedule ➢ **First Internal Test:**	**10**
Unit3– Sampling Design, Data Collection and Measurement ➢ **Sampling Design:** Concept, Steps In Sampling Design, Different types of sample design, how to select a sample, sampling errors ➢ **Measurement and Scaling:** Concept, meaning, Measurement Scales ,Test of sound measurement, Developing measurement tools, scale construction techniques ➢ **Data Collection:** Classification of Data, Primary and Secondary data –Sources – advantages / disadvantages, Data Collection Methods: Observations, Survey, Interview and Questionnaire, Schedules, Quantitative and Qualitative Techniques of data collection, Selection of Appropriate Method for Data Collection, Factors influencing choice of method of data collection ➢ **Data Processing:** Editing, Codification Classification, Tabulation, problems in processing ➢ **Pilot Study :** Concept and importance.	➢ **Reference Text:** ➢ Research Methodology by Dr. Atul Dhingra ➢ ➢ **Required Reading:** Sampling and Sample Design, Fieldwork, Data Collection, and Tabulation ➢ **Case:** Perform sample design, collect data using appropriate data collection methods, and prepare data for further analysis by applying data processing techniques. Then, perform the pilot study. **Home Assignment / Flipped Classroom:** Compare various sampling techniques, how to overcome sampling errors, study advantages and limitations of various data collection methods.	

Unit4–Analysis and Interpretation of Data ➢ **Data Analysis:** Meaning, Need, Types of Analysis– Univariate, bivariate, and multivariate analysis of Data, ➢ **Statistics in Research:** Central Tendency, Dispersion, Skewness, Relationship, Correlation, R egression, Factor analysis, Cluster Analysis ➢ **Interpretation:** Meaning, Need, Techniques of Interpretation, Precaution in Interpretation	➢ **Reference Text:** ➢ Business Research Methods by Donald R. Cooper & Pamela S. Schindler, Tata McGraw-Hill Edition ➢ **Required Reading:** Exploring, displaying, and examining data, measures of association, presenting insights. ➢ **Case:** ➢ Select and apply the various data analysis techniques and statistics on your data, draw graphs, and write the insights ➢ **Home Assignment / Quiz:**	**10**
Unit 5 – Testing of Hypotheses and Writing Interpretation, Conclusion and Findings ➢ Types of Hypotheses testing ➢ Procedure for Hypotheses testing ➢ Flow diagram of Hypotheses Testing ➢ Type-I and Type-II errors ➢ Parametric Tests: T-test, F-test, Z- test ➢ Non-Parametric Tests: Chi- square and ANOVA (one way & two way) Limitations of the test of Hypotheses	➢ **Reference Text:** Research Methodology – Methods and Techniques by C.R.Kothari, NewAgeInternational Publishers ➢ **Required Reading:** Methods of hypothesis testing ➢ **Case:** Perform hypothesis testing by using appropriate tests, draw conclusions, and write findings of your research. ➢ **Home Assignment / Flipped Classroom:**	

Unit6–Research Report, Paper writing ➢ **Research Report:** Importance of Report Writing, Types of Research Reports, Structure or Layout of Research Report ➢ **Research Paper:** Meaning of Research Paper, Structure of Research Paper, and its publications . ➢ **Referencing Style & Bibliography:** Author, Date System, Footnote or Endnote System, Position of Notes, citing for the first time, Subsequent Citing, List of Abbreviation used in Citation, preparing a Bibliography, Classification of Entries, Bibliography Entries compared with Footnotes, Examples of Bibliography Entries ➢ **Software:** Use of reference managing software, Use of Plagiarism detection software ➢ **Research Grants:** Introduction to various research Funding agencies	➢ **Second Internal Test:** ➢ **Internal Project based on entire Course:**	**10**

Level(Semester): 6.0(II)

CourseNo:121 A-Scripting Language using JavaScript

Course Learning Objectives:

- To understand the core features of JavaScript.
- To provide basic knowledge for developing web pages using JavaScript.
- To impart the design, development and implementation of Dynamic Web Pages.
- To prepare students in building interactive and user-friendly web-pages using HTML and JavaScript.
- To enhance capabilities of students in dynamic and interactive websites.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
121A.1	Students can successfully embedding JavaScript into HTML for developing a web page.	1
121A.2	Students can add interactivity to the web page.	3
121A.3	Students can apply validation to web form and handle different events.	5

TextBook: HTML 5, CSS and JavaScript made simple by Ivan Bayros

Reference Books:

- The ABC's of Java Script by Lee Purcell Mary Jane Mara, BPB Publication
- The Complete Reference – Web Design, Thomas A. Powell, TMH, ISBN 0-07-041186.
- How to become webmaster in 14 days, James L Mohler, Techmedia ISBN 1575211696.
- HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross, BPB Publishing ... ISBN: 8176562742
- Web References: www.w3c.org, www.sybex.com ISBN 0-07-041186
- Web Enabled Commercial Application Development using HTML, DHTML, Java Script,PERL ISBN 13: 9788183330084.
- The Complete Reference HTML and CSS 5th Edition, McGrawhill Publication.
- JavaScript: The Definitive Guide, Sixth Edition Activate Your Web Pages By David Flanagan Publisher: O'Reilly Media

Session Plan:

Topics	Readings	No. of Session
Unit 1:Scripting Language Basic ➢ Meaning of Scripting Language ➢ Types of Scripting Languages (JavaScript, VBScript, Perl, ASP, PHP, Python) ➢ Difference between scripting language and programming language. ➢ Comparative study of client-side and server-side scripting. ➢ Advantages and disadvantages of scripting languages.	➢ **ReferenceText:** • The ABC's of Java Script. • HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross. ➢ **Required Reading** • Understanding meaning of Script. • Client-side and Server-side basics. ➢ **Activity:** • Collecting brief information of various or different client-side and server-sidescripting languages. ➢ **HomeAssignment**	**10**

Unit 2: JavaScript Fundamentals ➢ JavaScript - Introduction ➢ Advantages of using JavaScript. ➢ Limitation of JavaScript. ➢ Use of SCRIPT tag. ➢ Embedding JavaScript into HTML. ➢ Data-types and Literals in JavaScript. ➢ Methods of creating variables (using var, let, const). ➢ Operators and expression. ➢ JavaScript comments. ➢ Different methods of displaying data like innerHTML, document.write( ), console.log( )	➢ **ReferenceText** ➢ The ABC's of Java Script. ➢ HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross. ➢ **RequiredReading** ➢ Overview of HTML Tags. ➢ Basics of JavaScript. ➢ Basic concept of interactive web page. ➢ **Activity:** ➢ Creating the list of different operators. ➢ Creating the list of different methods of displaying data. ➢ **HomeAssignment**	**10**
Unit 3: JavaScript Programming Construct ➢ Conditional checking (if…else statement, switch statement). ➢ Looping statements (do…while loop, while loop, for loop, for in loop) ➢ Difference between do…while and while loop. ➢ Break and continue statements. ➢ Creating array in JavaScript. ➢ Properties and methods of an array. ➢ String and String functions in JavaScript.	➢ **First Internal Test** ➢ **ReferenceText:** • The ABC's of Java Script. • HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross. ➢ **RequiredReading** • Concept of conditional statements. • Concept of loops and array. ➢ **Activity:** • Make a list of different string methods and properties. • Making a list of different array methods and properties. ➢ **HomeAssignment**	**10**

Unit 4: Working with Functions and Dialog Boxes ➢ IntroductiontoFunction. ➢ Defining user defined Function. ➢ Elements / Components of function. ➢ Calling function. ➢ Built-in Conversion functions. ➢ Dialog boxes – Alert dialog box, Confirm dialog box, Prompt dialog box.	➢ **ReferenceText:** • The ABC's of Java Script. • HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross. ➢ **Required Reading** • Basic terminologies related to function. • Meaning of Dialog box. ➢ **Activity:** • Prepare chart of difference between alert and confirm dialog box. ➢ **Home Assignment**	**10**
Unit 5: JavaScript Objects ➢ Object meaning. ➢ Accessing properties and methods of an object. ➢ Math Object with Methods. ➢ Array Object with Methods. ➢ Date Object with Methods. ➢ Defining user defined object. ➢ Use of this keyword.	➢ **ReferenceText:** • The ABC's of Java Script. • HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross. ➢ **RequiredReading** • Understanding meaning of object. • Various methods and properties of objects like Math, Date and Array. ➢ **Activity:** • Developingwebpage to demonstrate use of methods of object like Math, Date and Array. ➢ **Home Assignment**	**10**

Unit 6: JavaScript Events And Exceptions ➢ Meaning of an event. ➢ JavaScript Events – onclick, onmouseover, onmouseout, onfocus, ➢ onkeypress, onkeyup, onkeydown, onsubmit, onblur. ➢ Exception definition. ➢ Use of try, catch, throw and finally	➢ **SecondInternalTest:** ➢ **ReferenceText:** • The ABC's of Java Script. • HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross. ➢ **RequiredReading** ➢ Understanding meaning of event and exception. ➢ **Activity:** ➢ Creating aninteractive webpage to handle different events using javascript. ➢ **HomeAssignment**	**10**

Level(Semester): 6.0(II)

CourseNo:122A-Advance Web Designing

Course Learning Objectives:

- To make student familiar with the meaning of responsive web page.
- To provide basic knowledge for developing web pages using CSS.
- To impart the design, development and implementation of Dynamic Web Pages using CSS.
- To prepare students in building interactive and user-friendly web-pages using HTML and CSS.
- To enhance capabilities of students in dynamic and interactive websites.
- To provide students with basic knowledge of XML.
- To make students familiar with the basic concepts of Bootstrap and how it helps make websites look cool and work on different devices.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
122A.1	Students cansuccessfully apply various styling techniques to CSS including changing colors, fonts, margins, padding and borders.	1
122A.2	Students should grasp the fundamental structure of XML documents, including elements, attributes, and nesting.Create well-formed and valid XML documents adhering to defined Document Type Definitions (DTD) or XML Schema Definitions (XSD).	3
122A.3	Students can effectively useBootstraps components, such as navigation bar, button, modals, carousels and form to enhance the user experience. Apply responsive grid system and components to create web designs that adapts seamlessly to various screen sizes and devices.	5

TextBook:HTML 5, CSS and JavaScript made simple by Ivan Bayross

Reference Books:

- The Complete Reference HTML and CSS 5th Edition, McGrawhill Publication.
- "CSS: The Definitive Guide" by Eric A. Meyer and Estelle Weyl, O'Reily Media Publication, ISBN-13: 978-1449393199
- "CSS Secrets Better Solutions to Everyday Web Design Problems" by Lea Verou, O'Reily Media Publication, ISBN-13: 978-1449372637
- "CSS: The Missing Manual" by David Sawyer McFraland, O'Reily Media Publication, ISBN-13: 978-1449397238
- "Smashing CSS: Professional Techniques for Mordern Layout" by Eric Meyer, Smashing Magazine, ISBN-13: 978-0470977279.
- Internet and Web Technologies by Raj Kamal.
- Web Designing and Development for Beginners by Gaurav Gupta.
- "XML: A Beginner's Guide" by Kogent Learning Solution Inclusive, Dreamtech Press, ISBN-13: 9788177228291.
- "XML and Related Technologies" by AtulKahate, Oxford University Press, ISBN-13: 978-0195674992.
- "Bootstrap 4Quick start: Responsive Web Design and Development Basics for Beginners", by Jacob Lett, Packt Publishing, ISBN-13: 978-1789344912
- "Mastering Bootstrap 4"by Benjamin Jakobus and Jason Marah, Packt Publishing, ISBN-13: 978-1788835401

Session Plan:

Topics	Readings	No. of Session
Unit 1:Introduction to Cascaded Style Sheet (CSS) ➢ CSS Introduction. ➢ Advantage of CSS. ➢ Disadvantage of CSS. ➢ Syntax for writing CSS. ➢ Methods of Adding CSS (Inline, internal and external). ➢ Meaning of Selectors. ➢ Types of Selectors (Element, ID, Class, Universal, Group Selector). ➢ Using <DIV> and <SPAN> tag.	➢ **ReferenceText:** • The Complete Reference HTML and CSS 5th Edition, McGraw-Hill Publication. ➢ **Required Reading** • Understanding meaning of CSS. • Meaning of Selector and Types of selectors. ➢ **Activity:** • Design a web using different types / methods of CSS. ➢ **HomeAssignment**	**10**

Unit 2:CSS FundamentalsProperties ➢ Inserting Comments in CSS. ➢ Different measurement units in CSS. ➢ CSS Colors and Methods of specifying colors (Color-name, RGB, RGBA, HEX, HSL, HSLA). ➢ Height and Width properties. ➢ CSS Background properties. ➢ CSS Border properties. ➢ CSS Outline properties. ➢ CSS Margin properties. ➢ CSS Padding properties.	➢ **ReferenceText** • The Complete Reference HTML and CSS 5th Edition, McGraw-Hill Publication. ➢ **RequiredReading** ➢ Introduction of CSS. ➢ Various properties of CSS. ➢ **Activity:** ➢ Gather information about primary, secondary and complementary colors. ➢ **HomeAssignment**	**10**
Unit 3: Formatting text using CSS ➢ CSS Text properties. ❖ Color ❖ background-color ❖ text-decoration ❖ text-align ❖ vertical-align ❖ text-indent ❖ text-transform ❖ white-space ❖ letter-spacing ❖ word-spacing ❖ line-height ➢ CSS Font Properties. ❖ font-family ❖ font-size ❖ font-style ❖ font-variant ❖ font-weight	➢ **First Internal Test** ➢ **ReferenceText:** • The Complete Reference HTML and CSS 5th Edition, McGraw-Hill Publication. ➢ **RequiredReading** • What is meant by formatting? ➢ **Activity:** • Make list of different aspects with regard to text formatting. • Make list of different aspects with regard to paragraph formatting. • Make list of different aspects with regard to page formatting. ➢ **HomeAssignment**	**10**

Unit 4: CSS Links, List and Tables ➢ CSS Link Properties. ❖ Link ❖ Visited ❖ Hover ❖ Active ➢ CSS List Properties. ❖ List-style-type ❖ List-style-position ❖ List-style-image ➢ CSS Table Properties.	➢ **ReferenceText:** • The Complete Reference HTML and CSS 5th Edition, McGraw-Hill Publication. ➢ **RequiredReading** • Basic terminologies related to Links. • Types of links. ➢ **Activity:** • Prepare chart of difference between absolute path / link and relative path / link. ➢ **HomeAssignment**	**10**
Unit 5: Core Concepts of XML ➢ Introduction. ➢ Difference between XML and HTML. ➢ Parts of XML documents (Elements, Attributes). ➢ XML DTD. ➢ XML Schema. ➢ XML Namespaces. ➢ XML with CSS.	➢ **ReferenceText:** • "XML: A Beginner's Guide" ➢ **RequiredReading** • Basic knowledge of tags. • Basic knowledge regarding meaning of validation. ➢ **Activity:** • Create a chart regarding the difference between HTML and XML. ➢ **HomeAssignment**	**10**

Unit 6: Fundamentals of Bootstrap ➢ Introduction to Bootstrap. ➢ Basic structure of Bootstrap. ➢ Basic components of Bootstrap like • Navbar • Buttons • Badges ➢ Content Components • Typography. • Headings • Images and Cards	➢ **SecondInternalTest:** ➢ **ReferenceText:** • Mastering Bootstrap 4. ➢ **RequiredReading** • Basic of Web Designing. • Basic of Style Sheets. ➢ **Activity:** • Make list of different components of Bootstrap with its use. ➢ **HomeAssignment**	**10**

Level(Semester): 6.0(II)

CourseNo:123A- Practical Based on 121A and 122A

Course Learning Objectives:

- To embed JavaScript into HTML and create interactive web elements.
- To proficiently utilize JavaScript popup boxes (Alert, Confirm, and Prompt) for user interaction.
- To demonstrate proficiency in JavaScript by implementing user-defined functions and conditional statements.
- To create a web page with inline and internal style sheets.
- To create a web page using external style sheets.
- To utilize various selectors in web page development.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
123A.1	Students will demonstrate the ability to embed JavaScript into HTML and apply inline and internal style sheets.	3
123A.2	Students will showcase proficiency in using Popup boxes (Alert, Confirm, and Prompt) with JavaScript and creating web pages with external style sheets.	3
123A.3	Students will exhibit competence in creating and using user-defined functions in JavaScript and designing web pages that utilize different types of CSS selectors.	3

Practical of Scripting Language using JavaScript 1. Write a program to embed JavaScript into HTML. 2. Write a JavaScript code to demonstrate use of Popup boxes (Alert, Confirm and Prompt). 3. Write a JavaScript code to demonstrate use of user-defined function. 4. Write a JavaScript code to demonstrate use of Conditional Statements. 5. Write a JavaScript code to calculate factorial of a given number. 6. Write a Java Script code to display even and odd numbers from given range. 7. Write a JavaScript code to demonstrate use of different string methods. 8. Write a JavaScript code to addition of two numbers using web form. 9. Write a JavaScript to demonstrate use of Array object and its methods. 10. Write a JavaScript to demonstrate use of various methods of Math object. 11. Write a JavaScript to demonstrate use of Date object and its methods. 12. Write a JavaScript code to demonstrate use of onclick event. 13. Write a JavaScript code to demonstrate use of onmouseover and onmouseout events. 14. Write a JavaScript code to demonstrate use of onfocus, onblur, onload and onsubmit events. 15. Write a JavaScript code for checking client validation (not null). 16. Write a JavaScript code for checking client validation (check numeric value). 17. Write a JavaScript to demonstrate used of Exception handling.	**60**
Practical of Advance Web Design using CSS 1. Develop a web page to demonstrate use of inline and internal style sheets. 2. Develop a web page to demonstrate use of external style sheets. 3. Develop a web page to demonstrate use of different types of selectors. 4. Develop a web page using html,CSS to change the styling of text selection. 5. Develop a web page to demonstrate the use of various text properties of CSS. 6. Develop a web page to using html, CSS to create a list with floating headings for each section. 7. Develop a simple web page using bootstrap.	

Level(Semester): 6.0(II)

Course No. – 124A: Practical Based on 125 C++ Programming

Course Learning Objectives:

- Understand the fundamental principles of object-oriented programming in C++ and demonstrate the ability to create and utilize classes and objects in program design.
- Develop proficiency in defining functions both inside and outside class structures in C++ programs and comprehend their significance in code organization.
- Demonstrate the proficiency in working with default arguments within functions and understand their role in simplifying function calls and code readability.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
124A.1	Students will be able to write C++ programs that effectively utilize classes and objects to model real-world entities.	1
124A.2	Students will demonstrate proficiency in defining and using functions both within and outside class structures, including the use of default arguments and function overloading.	3
124A.3	Students will be capable of utilizing advanced C++ features, such as inheritance (single, multiple, and multilevel), constructors, destructors, virtual and pure virtual functions, templates, and exception handling in their programs.	5

Session Plan:

Topics	No. of Session
Practical Based on 125: C++Programming 1. Write C++ program to demonstrate the use of class and object 2. Write C++ program to demonstrate function definition inside and outside the class. 3. Write C++ program to demonstrate default arguments in functions. 4. Write a C++ program to demonstrate function overloading 5. Write a C++ program to demonstrate binary operator overloading using member function. 6. Write a C++ program to demonstrate binary operator overloading using friend function. 7. Write a C++ program to demonstrating the use of constructors and destructor 8. Write a C++ program to demonstrate the Single & multiple inheritance. 9. Write a C++ program to demonstrate multilevel and hierarchical inheritance 10. Write a C++ program to demonstrate role of constructor in single, multiple and multilevel inheritance. 11. Write a C++ program to demonstrate the use of virtual and pure virtual function 12. Write a C++ program to demonstrate the concept of function template & class template. 13. Write a C++ program to demonstrate Exception Handling 14. Write a C++ program to demonstrate the use of ifstream and ofstream class in file management. 15. Write a C++ program to demonstrate file management using classes.	**60**

Level(Semester): 6.0(II)
CourseNo:121B-HTML & PHP Language

Course Learning Objectives:

- To acquaint the students with the concept of HTML and Server Side Concepts.
- To enable students to develop interactive code/programs in PHP
- To enhance the programming skill to connect with server and databases.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
121B.1	Demonstrate proficiency in handling the various tags in html	1
121B.2	Develop the skill to write down the client server codes in PHP	3
121B.3	Develop the knowledge of 3 tier application	5

REFERENCE BOOKS:

- Joel Sklar, "Textbook of Web Designing", Cengage Learning Publication 2009
- Jennifer Niederst, "Web designing in Nut Shell (Desktop Quick Reference)", O'Reillypublication
- Ivan Bayross, "Web Enabled Commercial Application Development using HTML, DHTML,Java Script, PERL, CGI", BPB Publication
- Dave Mercer, Allan Kent, Steven Nowicki, David Mercer, Dan Squier, Wankyu Choi, "Beginning PHP5", Wiley Publishing(Wrox) ISBN: 0-7645-5783-1
- Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz,Jason Gerner, "Beginning PHP, Apache, MySQL Web Development", Wiley Publishing(WROX),March 2004, ISBN: 978-0-7645-5744-6
- Luke Welling, Laura Thompson, Sams, "PHP, MySql Web Development", second edition
- Ivan Bayross, Sharanam Shah, THE X Team , "PHP for Beginners", SPD

Session Plan:

Topics	Readings	No. of Session
Unit 1 : HTML ➢ Introduction: Structure of HTML ➢ HTML Tags: Text formatting tags, images, List, Tables,Anchor-Internal and External Linking and Frames. ➢ Understanding Form Syntax, using elements of forms to create simple forms. ➢ Style & Types of styles-Internal/External Style Sheets.	➢ **Reference Text:** Jennifer Niederst, Web Designing in NutShell , Ivan Bayross,"Web Enabled Commercial Application Development" ➢ **Required Reading:** Fundamentals of HTML. ➢ **Case:** Study the different tags of HTML ➢ **Home Assignment:** Study of html and its tags	**10**
UNIT 2 : Scripting Language Basics ➢ Meaning of Scripting language. ➢ Types of Scripting – client side and server side scripting ➢ Scripting Language vs. programming Language ➢ Difference between client-side and server-side scripting ➢ Advantage and Disadvantages of Scripting Languages	➢ **Reference Text** Ivan Bayross: PHP for Beginners ➢ **Required Reading** Basics and introduction of scripting ➢ **Case:** Understanding difference between Scripting and languages. ➢ **Home Assignment/Flipped Classroom:** Study of Scripting language in detail. **First Internal Test:**	**10**

UNIT 3: Programming with PHP ➢ PHP Structure and Syntax ➢ Embedding PHP in HTML ➢ Constants and Variables ➢ Passing Variable between Pages ➢ Using if/else, Switch ➢ Loops ➢ String ➢ Operators ➢ Includes ➢ Functions ➢ Arrays ➢ Using PHP $_GET, PHP $_POST	➢ **Reference Text** Ivan Bayross: PHP for Beginners ➢ **Required Reading:** Tokens, DataTypes and Syntax of the languages ➢ **Case:** Perform basic programming using various statements. ➢ **Home Assignment/Flipped Classroom:** Various codes/program using conditional, loops and arrays	**10**
UNIT 4: Working with Forms ➢ Processing Forms ➢ Form Files & Directories ➢ PHP SESSION ➢ PHP Cookies	➢ **Reference Text:** "BeginningPHP5",Wiley Publishing (Wrox) ➢ **Required Reading:** Form Creating, Session and Cookies ➢ **Case:** Small codes/program to used forms. ➢ **Home Assignment/Quiz:** Working with small applications.	**10**

UNIT 5: Introduction to MYSQL ➢ Introduction to MySQL ➢ Data type in MySQL ➢ Interacting with Databases using PhpMyAdmin ➢ Modifying Database Records Using PHP ➢ MySQL Connect, Create, Insert, select, Where, Orderby, Update, Delete using PHP ➢ Import Export MySQL Database.	➢ **Reference Text:** "Beginning PHP, Apache, MySQL Web Development", Wiley Publishing(WROX) **Required Reading:** Creating database in MYSQL ➢ **Case:** Linking HTML page with MYSQL ➢ **Home Assignment/Flipped Classroom:** Creating Small Codes/Program to store/retrieve and manipulate data from mysql.	**10**
UNIT 6: OOPs Concept and Advanced PHP ➢ Introduction, Advantages ➢ Class & object, data member, data fields. ➢ Inheritance, constructor & destructor, abstract classes, final classes. ➢ Exception handling ➢ Emailing in PHP ➢ File uploading ➢ Loading PHP application on web server By FTP.	➢ **Reference Text:** "BeginningPHP5",Wiley Publishing (WROX) ➢ **Required Reading:** OOPs Concepts ➢ **Second Internal Test:** ➢ **Internal Project based on entire Course:**	**10**

Level (Semester): 6.0 (II)
122B: Communication Skill

Course Learning Objectives:

- To acquaint the students with 4 fold of the basic communications skills.
- To enable students to understand the importance of communication skills and its applicability in real life.
- To enhance capabilities of students by developing their verbal and nonverbal communication skills in day to day life as well as in the field of business and social life.
- To develop effective communication skills as well as interview skills, presentations skills, interpersonal skills and written communication.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
122B.1	Utilize the 4 fold of the basic communications skills in their life.	1
122B.2	Apply the learning of communication skills and its applicability in real life.	3
122B.3	Develop strong verbal and nonverbal communication skills	3
122B.4	Develop effective communication skills interview skills, presentations skills, interpersonal skills and written communication.	5

Text Book:

- English and Communication Skills By Alwinderdhillon, P.K. Singla, Abhishek Publication Chadigarh

Reference Books:

- Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011
- Communication skills, Sanjay Kumar, Pushpalata, 1st Edition, Oxford Press, 2011
- Brilliant- Communication skills, Gill Hasson, 1st Edition, Pearson Life, 2011
- The Ace of Soft Skills: Attitude, Communication and Etiquette for success, Gopala Swamy Ramesh, 5th Edition, Pearson, 2013
- Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD, 2010
- Communication skills for professionals, KonarNira, 2nd Edition, New arrivals – PHI, 2011
- Personality development and soft skills, Barun K Mitra, 1st Edition, Oxford Press, 2011

- Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning Indiapvt.ltd, 2011
- Soft skills and professional communication, Francis Peters SJ, 1stEdition, Mc Graw Hill Education, 2011

Session Plan:

Topics	Readings	No. of sessions
Unit 1 - Communication Skills: ➢ Introduction: Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context ➢ Barriers to communication: Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers ➢ Perspectives in Communication: Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment	➢ **Reference Text:** M. Ashraf Rizvi ,Effective Technical Communication, Tata McGraw Hill ➢ **Required Reading** ➢ **Activity:** • Group Discussions • Role-Playing Exercises • Public Speaking Practice • Communication Styles Quiz • Debates • Interview Simulation • Empathetic Listening Practice • Effective Email Writing • Cross-Cultural Communication Exercise ➢ **Home Assignment:** Write down process and barrier of communication	**10**
Unit 2 - Elements of Communication: ➢ Introduction, Face to Face, Communication – Tone of voice, Body Language (Non-Verbal Communication), Verbal Communication, Physical Communication. ➢ Communication Styles: Introduction, The Communication styles Matrix with example for each- Direct Communication style, Spirited Communication style, Systematic Communication style, Considerate Communication style. ➢ Role and purpose of communication, 7 C's of	➢ **Reference Text** Business Communication, Raman – Prakash, Oxford ➢ **Required Reading** ➢ **Activity:** • Delivery of speech using verbal and nonverbal communication • Communication Process Flowchart • Nonverbal Communication Exercise	**10**

communication	• Barrier Identification • Message Analysis • Listening Skills Workshop • Communication Technology Presentation • Feedback and Empathy Role-Play • Channel Selection Exercise ➢ **Home Assignment / Flipped Classroom:** Write down different types and styles of communication ➢ First Internal Test	
Unit 3 – Listening and Speaking Skills ➢ Basic Listening Skills: Introduction, Hearing Vs listening, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations, The process, importance and types of listening, Effective Listening: Principles and Barriers, Guidelines to increase listening, Activities to enhance listening ➢ Workplace communication: Communication through Electronic Channels, Introduction, and Technology based Communication Tools, Video Conferencing, Web Conferencing, Selection of the Effective Tool, E-mails, Fax etc. ➢ Speaking Skills: Introducing yourself, Describing a person, place, situation and event, Giving instruction, Making inquiries – at a bank, post-office, air-port, hospital, reservation, counter and role play	➢ **Reference Text:**Ramon & Prakash, BusinessCommunication, Oxford ➢ **Required Reading:** ➢ **Activity:** • Storytelling Circle • Interview Simulation • News Reporting Exercise • Podcast Creation • Picture Descriptions • Impromptu Speaking • Pronunciation and Phonetics Practice • Listening Comprehension Quizzes • Role-Play Scenarios • Public Speaking Workshop • TED Talk Analysis ➢ **Home Assignment / Flipped Classroom:**	**10**
Unit 4 – Interview and Presentation Skills ➢ Interview Skills: Purpose of an interview, Do‘s and Dont‘s of an interview, Preparation for interview, Resume Writing, Covering Letters,	➢ **Reference Text:**Krishnaswamy, N, Creative English for Communication, Macmillan ➢ **Required Reading:**	**10**

Facing Interviews-Fundamentals and Practice Session, Conducting Interviews- Fundamentals and Practice Session ➢ Presentations: Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery,4Ps (Planning, Preparation, Practice, Presentation), ➢ Group Discussion: Introduction, Communication skills in group discussion, Do's and Dont's of group discussion	➢ **Activity:** • Mock Interview Sessions • Elevator Pitch Practice • Group Interview Role-Play • Presentation Design and Delivery • Peer Feedback Sessions • Expert Interview Project • Handling Difficult Questions • Virtual Interview Simulation • Nonverbal Communication Assessment • Impromptu Presentations • Storytelling in Presentations • Guest Speaker Presentations ➢ **Home Assignment/Quiz**	
Unit 5 – Writing and Reading Skills ➢ Effective Written Communication: Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion Required, Shades of Meaning, Formal Communication ➢ Writing Effectively: Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message ➢ Letter Writing: Types, Formats, Official Correspondence : Memo, Notice and Circulars, Agenda and Minutes ➢ Report Writing: Purpose and Scope of a Report, Fundamental Principles of Report Writing, Project Report Writing, Summer Internship Reports ➢ Effective Reading: Process, types and reading rate adjustment, Tips for improving reading skills, Reading Comprehension	➢ **Reference Text:** Textbook of Business Communication, Ramaswami S, Macmillan ➢ **Required Reading:** ➢ **Activity:** • Journaling • Creative Writing Prompts • Collaborative Story Writing: • Opinion Writing • Letter Writing • Editing and Proofreading Workshop • Blogging • Vocabulary Building • Reading Activities • Book Clubs • Reading Response Journal: • Text Annotation • News Article Analysis • Reading Comprehension Exercises	**10**

	• Literature Circles • Reader's Theater • Genre Exploration ➢ **Home Assignment/Flipped Classroom:**	
Unit 6 – Non Verbal Communication ➢ Relevance and effective usage, Para language, Chronemics, Haptics, Proxemics, Body language, Object language ➢ Professional Skills: Negotiations, Meetings, Email writing and Telephonic Skills	➢ **Reference Text:** Anjanee Sethi&Bhavana Adhikari, Business Communication, Tata McGraw Hill ➢ **Activity:** • Facial Expression Exploration • Body Language Role-Play • Mirror Exercise • Emotion in Voice • Nonverbal Communication in Media • Cultural Differences in Body Language • Nonverbal Communication and Empathy • Observation Challenge • Nonverbal Communication in Presentations • Nonverbal Communication and Gender • Nonverbal Communication in Leadership ➢ **Second Internal Test:**	**10**

Level(Semester): 6.0(II)

Course No. – 123B: Practical Based on 121B HTML & PHP Language and 122B Communication Skill

Course Learning Objectives:

- To impart fundamental understanding of ICT basics.
- To familiarize students with computer input and output devices.
- To develop proficiency in operating systems.
- To equip students with essential word processing, spreadsheet, and presentation skills.
- To introduce students to basic database management and web design concepts.
- To enhance listening skills through practice.
- To improve reading skills through practice and assessment.
- To develop speaking skills via role play and communicative activities.
- To enable proficient letter writing using MS WORD.
- To master technical report writing using MS WORD and other communication techniques.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
123B.1	Students will demonstrate Intermediate Cognitive Skills (Level 2) in html and php through practical application in web development projects	2
123B.2	Students will achieve Advanced Cognitive Skills (Level 3) by effectively communicating technical concepts through presentations, reports, and written documents.	3
123B.3	Students will apply Higher-Order Cognitive Skills (Level 4) by engaging in critical discussions, debates, and problem-solving exercises related to contemporary web technologies.	4

Session Plan:

Practical Based on 121B - HTML & PHP Language	
1. Develop a web page using basic HTML tags 2. Develop a web page using Lists 3. Develop web pages using internal and external Hyperlinks 4. Develop a web page using tables 5. Develop a web form 6. Design a web page using frames 7. Write a PHP script to demonstrate use of $_GET and $_POST. 8. Write a PHP script to display table of a number. 9. Write a PHP script to calculate factorial of a number. 10. Write a PHP script to create a Simple Login Window with validation. 11. Write a PHP script to Demonstrate inbuilt functions. 12. Write a PHP script to demonstrate use of user defined Function. 13. Creation of MySql database demonstration of various SQL queries(create table,insert, update,delete) 14. Accessing MySql data from PHP script: Displaying tables and fields along with their types andconstraints, table data in tabular format. 15. Write a PHP script to Demonstrate OOPS Concept In PHP.	**30**

Practical Based on 122B - COMMUNICATION SKILL 1. Listening Skill: Practice 2. Reading Skill: Practice and Test 3. Speaking Practice: Role Play and Communicative Activities 4. Letter writing: Practice and Test using MS WORD 5. Technical Report writing using MS WORD 6. E-mail Writing 7. Presentation on any technical topic using PPT 8. Draft a job application letter with resume using computer 9. Group discussion on recent topics 10. Personal Interview 11. Write Memo, letter and circulars using MS WORD 12. Prepare agenda and minutes of meeting and perform a meeting using MS WORD 13. Perform a debate on recent topics 14. Delivery of a speech on general topics emphasis on non-verbal communication 15. Writing business letter using MS WORD	**30**

Level(Semester): 6.0(II)

Course No. – 124B: Practical Based on 125 C++ Programming

Course Learning Objectives:

- Understand the fundamental principles of object-oriented programming in C++ and demonstrate the ability to create and utilize classes and objects in program design.
- Develop proficiency in defining functions both inside and outside class structures in C++ programs and comprehend their significance in code organization.
- Demonstrate the proficiency in working with default arguments within functions and understand their role in simplifying function calls and code readability.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
124B.1	Students will be able to write C++ programs that effectively utilize classes and objects to model real-world entities.	1
124B.2	Students will demonstrate proficiency in defining and using functions both within and outside class structures, including the use of default arguments and function overloading.	3
124B.3	Students will be capable of utilizing advanced C++ features, such as inheritance (single, multiple, and multilevel), constructors, destructors, virtual and pure virtual functions, templates, and exception handling in their programs.	5

Session Plan:

Topics	No. of Session
Practical Based on 125: C++Programming 1. Write C++ program to demonstrate the use of class and object 2. Write C++ program to demonstrate function definition inside and outside the class. 3. Write C++ program to demonstrate default arguments in functions. 4. Write a C++ program to demonstrate function overloading 5. Write a C++ program to demonstrate binary operator overloading using member function. 6. Write a C++ program to demonstrate binary operator overloading using friend function. 7. Write a C++ program to demonstrating the use of constructors and destructor 8. Write a C++ program to demonstrate the Single & multiple inheritance. 9. Write a C++ program to demonstrate multilevel and hierarchical inheritance 10. Write a C++ program to demonstrate role of constructor in single, multiple and multilevel inheritance. 11. Write a C++ program to demonstrate the use of virtual and pure virtual function 12. Write a C++ program to demonstrate the concept of function template & class template. 13. Write a C++ program to demonstrate Exception Handling 14. Write a C++ program to demonstrate the use of ifstream and ofstream class in file management. 15. Write a C++ program to demonstrate file management using classes.	**60**

Level (Semester): 6.0 (II)

Course No: 121 C Advance Excel for Data Analytics

Course Learning Objectives:

- To aware the students about using Advance Excel for Data Analytics.
- To introduce various variables, use of statistics for Data Analytics.
- To aware students about use of Probability for Data Analytics.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
121C.1	Student will possess basic knowledge of using Advance Excel, Variables, calculating Mean, range, variance for Data Analytics.	1
121C.2	Students will possess basic concepts of Probability and use of probability for data Analytics.	3
121C.3	Students will come to know the Basic and Advance Excel and using various functions, filters, slicers, managing axis, pivot table, CSV files etc.	5

Reference Books:

- Application of Data Analysis Essentials Certificate; AICPA
- Fundamentals of Business Analytics, 2nd Edition; R N Prasad, SeemaAcharya; Wiley
- Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson
- Data Analytics with R; BhartiMotwani; Wiley.
- Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019
- Advanced Excel for Productivity By Chris Urban · 2016
- Advanced Analytics with Excel 2019 - Perform Data Analysis Using ExcelÕs Most Popular Features By Manisha Nigam · 2020

Session Plan:

Topics	Readings	No. of Session
Unit 1 - Variables for Data Analytics • Types of Variables: • Determine the nature of variables in data analysis • Differentiate between numerical and categorical. Variables • Distinguish between nominal and ordinal variables • Differentiate between interval and ratio • Distinguish between continuous and discrete	**Reference Text:** • Application of Data Analysis Essentials Certificate; AICPA • Fundamentals of Business Analytics, 2nd Edition; R N Prasad, Seema Acharya; Wiley • Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson • Data Analytics with R; Bharti Motwani; Wiley • Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019 • Advanced Excel for Productivity By Chris Urban · 2016 • **Advanced Analytics with Excel -2019** Perform Data Analysis Using Excel's Most Popular Features By Manisha Nigam · 2020 **Required Reading** What is variable, types of variables differences in variables **Activity:** Collect information about variables used in Data Analytics and prepare summary. **Home Assignment**	**10**

Unit 2 - Essential Statistics Data Analytics • Central Tendency of Data: Identify the components of central tendency • Calculate mean/ median /mode • Identify the steps in calculating weighted / geometric/ harmonic means • Measurement and Variability: Determine core aspects of measurement and variability • Calculate range Calculate quartiles - Calculate interquartile range • Calculate variance Calculate standard deviation • Analyze permutation with repetition • Analyze combinations without repetition	**Reference Text** • Application of Data Analysis Essentials Certificate; AICPA • Fundamentals of Business Analytics, 2nd Edition; R N Prasad, Seema Acharya; Wiley • Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson • Data Analytics with R; Bharti Motwani; Wiley. • Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019 • Advanced Excel for Productivity By Chris Urban · 2016 • **Advanced Analytics with Excel -2019** Perform Data Analysis Using Excel's Most Popular Features By Manisha Nigam · 2020 **Required Reading** • Statistical terms required in analytics. • Formula for calculation of mean • How to calculate variance • Concept of Measurement and Variability **Activity:** • Prepare Summary of Essential Statistics for Data Analytics.	**10**

Unit 3: Probability for Data Analytics • Basic Probability: Uses of probability • Differentiate between sample space, event, independent and dependent • Calculate probability Probability and Ven Diagramming • Analyze "this" OR "that" diagram - Analyze "this" AND "that" diagram Analyze exclusive diagram - Joint probability • Conditional probability Calculating Probability: Calculate P using a contingency table Calculate P from trees • Calculate Bayes' theorem Calculate the mean in terms of probabilities • Calculate the variance and standard deviation in terms of probabilities - Calculate conditional probability	**First Internal Test** **Reference Text:** • Application of Data Analysis Essentials Certificate; AICPA • Fundamentals of Business Analytics, 2nd Edition; R N Prasad, Seema Acharya; Wiley • Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson • Data Analytics with R; Bharti Motwani; Wiley. • Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019 • Advanced Excel for Productivity By Chris Urban · 2016 • **Advanced Analytics with Excel -2019** Perform Data Analysis Using Excel's Most Popular Features By Manisha Nigam · 2020 **Required Reading** • What is probability • Use of probability • What is Ven Diagram **Activity:** • Prepare summary of probability & its use. **Home Assignment** **First Internal Test**	**10**

Unit 4: Introduction to Excel • About Excel & Microsoft, Uses of Excel, Excel software, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage View, Formula Bar, Workbook Window, Status Bar, Task Pane, Workbook & sheets Columns & Rows • Selecting Columns & Rows, Changing Column Width & Row Height, Auto fitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell Format, value, formula	**Reference Text:** • Application of Data Analysis Essentials Certificate; AICPA • Fundamentals of Business Analytics, 2nd Edition; R N Prasad, Seema Acharya; Wiley • Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson • Data Analytics with R; Bharti Motwani; Wiley. • Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019 • Advanced Excel for Productivity By Chris Urban · 2016 • **Advanced Analytics with Excel -2019** Perform Data Analysis Using Excel's Most Popular Features By Manisha Nigam · 2020 **Required Reading** • How to use Basic Excel **Activity:**	**10**
Unit 5: Advanced Excel for Data Analytics – I • Ranges, Selecting Ranges, Entering Information Into a Range, Using AutoFill • Basic formatting features, Conditional, Mathematical & Statistical Functions • Graphs, Various Charts- Bar Charts, Pie Charts, Line Charts • Using SLICERS, Filter data with Slicers • Manage Primary and Secondary Axis	**Reference Text:** • Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson • Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019 • Advanced Excel for Productivity By Chris Urban · 2016 • **Advanced Analytics with Excel -2019** Perform Data Analysis Using Excel's Most Popular Features By Manisha Nigam · 2020 **Required Reading** • Basic information about Advance Excel • Need of Formulas, formatting, validation • Types of Graphs, tables, Axis etc. **Activity:** • Prepare any report using Advance excel **Home Assignment**	**10**

Unit 6: Advanced Excel for Data Analytics – II • Sparkline, Pivot Table • Data Validation, Sorting, Filter, Excel Tables, working of range • Conditional Formatting Excel functions, Charts, highlight top bottom, Using the IF formulas, Using Slicers • Graphs and Sparkline • Pivot table and chart • CSV File • Histogram • Data Model in Excel	**Second Internal Test:** **Reference Text:** • Application of Data Analysis Essentials Certificate; AICPA • Fundamentals of Business Analytics, 2nd Edition; R N Prasad, Seema Acharya; Wiley • Business Analysis with Microsoft Excel and Power BI, 5th edition; Conrad G. Carlberg; Pearson • Data Analytics with R; Bharti Motwani; Wiley. • Introduction to Data Science Data Analysis and Prediction Algorithms with R By Rafael A. Irizarry · 2019 • Advanced Excel for Productivity By Chris Urban · 2016 • **Advanced Analytics with Excel -2019** Perform Data Analysis Using Excel's Most Popular Features By Manisha Nigam · 2020 **Required Reading** ➢ Understanding of Sparkline, Filter ➢ Formatting, Slicers, CSV file ➢ Use of Data Model & Histogram **Activity:** ➢ Identify examples for data visualization **Home Assignment** **Second Internal Test**	

Level (Semester): 6.0 (II)

Course No: 122C Fundamentals of Big Data and SPSS Software

Course Learning Objectives:

- To familiarize the students with all concepts including optimization techniques, simulation and big data analytics.
- To know HDFS (Hadoop Distributed File System) Concepts and Interfacing with HDFS.
- To understand Map Reduce Jobs
- To understand SPSS environment.
- To learn basic data analysis with SPSS.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
122C.1	Student will possess basic knowledge of Big Data, Optimization and simulation Techniques.	1
122C.2	Students will possess basic knowledge of Hadoop Distributed File System.	3
122C.3	Students will come to know the basic concept of SPSS software and the how to use SPSS for Data Analysis.	5

Reference Books:

- G.V. Shenoy, U.K. Srivastava, S.C.Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005.
- Banks, J., Carson, J. S. and Nelson, B. L. , Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006.
- James R. Evans., Business Analytics – Methods, Models and Decisions, Pearson Publications, 1st Edition, 2012.
- Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012
- Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012.
- Gordon, G., Systems Simulation, Prentice Hall, 2002.
- EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015.

Session Plan :

Topics	Readings	No. of Session
Unit 1 - Introduction to Big Data • Introduction of Big Data • Dimension of Big Data • Big Data Characteristics: Data Structure • Techniques of Big Data • Big Data Analytics • Applications of Big Data Analytics	**Reference Text:** • G.V. Shenoy, U.K. Srivastava, S.C.Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005. • Banks, J., Carson, J. S. and Nelson, B. L. , Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006. • James R. Evans., Business Analytics – Methods, Models and Decisions, Pearson Publications, 1st Edition, 2012. • Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012 • Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012. • Gordon, G., Systems Simulation, Prentice Hall, 2002. • EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015. **Required Reading**	**10**

	What is Bid Data, Dimensions, Techniques & Applications **Activity:** Search information about Big Data, Dimensions, Techniques & Applications **Home Assignment**	

Unit 2 - Big Data Analytics and Technologies • Types of Analytics: Descriptive, Prescriptive, Predictive • Tools of Analytics • Software for Analytics • Application of Excel, R, SPSS and SAS in Analytics • Introduction to Hadoop • Functioning of Hadoop • Cloud computing Tools	**Reference Text** • G.V. Shenoy, U.K. Srivastava, S.C. Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005. • Banks, J., Carson, J. S. and Nelson, B. L. , Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006. • James R. Evans., Business Analytics – Methods, Models and Decisions, Pearson Publications, 1st Edition, 2012. • Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012 • Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012. • Gordon, G., Systems Simulation, Prentice Hall, 2002. • EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015. **Required Reading** • About Data Analytics & Types • Tools for Data Analytics • Basics of SPSS, Hadoop • Basics of Cloud Computing **Activity:** • Prepare a summary report on Data Analytics, Tools, Applications of R, SPSS. • Prepare a summary report on Hadoop, its functioning & cloud Computing.	**10**

Unit 3: Hadoop Distributed File System (HDFS) • The Design of HDFS • HDFS Concepts • Command Line Interface • Hadoop file system interfaces • Data flow, • Data Ingest with Flume and Scoop and Hadoop archives • Hadoop I/O: Compression	**First Internal Test** **Reference Text:** • G.V. Shenoy, U.K. Srivastava, S.C. Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005. • Banks, J., Carson, J. S. and Nelson, B. L. , Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006. • James R. Evans., Business Analytics – Methods, Models and Decisions, Pearson Publications, 1st Edition, 2012. • Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012 • Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012. • Gordon, G., Systems Simulation, Prentice Hall, 2002. • EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015. **Required Reading** • Concept of Hadoop Distributed File System • Interfaces of HDFS **Activity:** • Compare Command line Interface and Hadoop File system interface • **Home Assignment** **First Internal Test**	**10**

Unit 4: Map Reduce • Anatomy of a Map Reduce Job Run & Failures • Job Scheduling • Shuffle and Sort • Task Execution • Map Reduce Types and Formats • Map Reduce Features	**Reference Text:** • G.V. Shenoy, U.K. Srivastava, S.C.Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005. • Banks, J., Carson, J. S. and Nelson, B. L. , Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006. • James R. Evans., Business Analytics – Methods, Models and Decisions, Pearson Publications, 1st Edition, 2012. • Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012 • Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012. • Gordon, G., Systems Simulation, Prentice Hall, 2002. • EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015. **Required Reading** • What is Map Reduce, Job Scheduling • Shuffle and Sort, Task Execution • Map reduce types and Features **Activity:** • Prepare summary report of Map Reduce **Home Assignment**	**10**
Unit 5 : Introduction of SPSS ➢ Introduction to SPSS ➢ Preparing the Data file: Creating data file and entering data, ➢ Defining the variables, Entering data, modifying data file, ➢ Managing Data: Listing	**Reference Text:** • G.V.Shenoy, U.K. Srivastava, S.C.Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005. • Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012 • Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012. • Gordon, G., Systems Simulation, Prentice Hall, 2002.	**10**

cases, replacing missing values, computing new variables, recording variables, exploring data, selecting cases, sorting cases, merging files. ➢ SPSS windows, Menus, Dialogue boxes.	• EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015. **Required Reading** Basic information of SPSS, Using SPSS **Activity:** Prepare list of systems / processes where SPSS can be used for analysis **Home Assignment**	

Unit 6: Statistical Analysis using SPSS ➢ Measures of Central Tendency and Measures of Dispersion ➢ Identify the steps in calculating weighted/geometric/harmonic means ➢ Measurement and Variability: Determine core aspects of measurement and variability ➢ Calculate range - Calculate quartiles - Calculate interquartile range ➢ Calculate variance - Calculate standard deviation – ➢ Charts- Bar Charts, Pie Charts, and Histograms. ➢ Basic Hypothesis Testing- (Chi-Sqaure, T-Test, Anova)	**Second Internal Test:** **Reference Text:** • G.V. Shenoy, U.K. Srivastava, S.C.Sharma, Operations Research for Management, New Age International, Revised 2nd Ed, 2005. • Banks, J., Carson, J. S. and Nelson, B. L. , Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006. • James R. Evans., Business Analytics – Methods, Models and Decisions, Pearson Publications, 1st Edition, 2012. • Frank J. Ohlhorst, Big Data Analytics: Turning Big Data into Big Money, John Wiley & Sons, 2012 • Taha Hamdy. Operation Research -An Introduction, Prentice-Hall, 9th edition, 2012. • Gordon, G., Systems Simulation, Prentice Hall, 2002. • EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, 2015. **Required Reading** • Using SPSS for statistical analysis • Working with variables • Calculating range, variance • Using charts, Hypothesis testing **Activity:** ➢ Try to do statistical analysis of result by using SPSS. ➢ Do Hypothesis Testing using SPSS. **Home Assignment** ➢ **Second Internal Test**	**10**

Level (Semester): 6.0 (II)

Course No. 123C: Practical Based on 121C and 122C

(121 C - Advance Excel for Data Analytics **AND**
122C -Fundamentals of Big Data and SPSS Software)

Course Learning Objectives:

- To develop pivot table and understand the validating & auditing techniques.
- To understand different formatting techniques in MS Excel
- To give an overview of the capabilities of popular statistical software packages.
- To give hands on experience about basic hypothesis testing using T tests, Chi Square tests and ANOVA.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
123C.1	Student will possess basic concept about programs, algorithm &Flowcharts	1
123C.2	Students will possess input,output and control flow statements using C Languages .	3
123C.3	Students will possess knowledge of Functions, Array, pointer and Files using C Languages.	5

Session Plan:

Topics	No. of Session
Practical Based on 121 C : **1.** Create an excel Spread Sheet for student list with marks details & calculate total, average, percentage & CGPA using custom formula & conditional, mathematical function. **2.** Create an excel spreadsheet to show summery of class & highlight top 10 of each subject, fail students using conditional formatting. **3.** Create spreadsheet for stock market analysis of 10 companies for 5year, and represent this data using various Graphs and Sparkline. **4.** Create spreadsheet for area wise salesman report & apply pivot table & prepare pivot table. **5.** Create spread sheet for importing data from text file, CSV file, Access file & export excel data into CSV File. **6.** Create MS Excel dash board.	**30**
Practical Based on 122C : **1.** Introduction to various menus, Data file, Output file, Frequently –used dialog boxes, Editing output, Printing results. Creating and editing a data file – Variable and data view, Value Labels using SPSS. **2.** Managing Data: Listing cases, replacing missing values, computing new variables, recording variables, exploring data, selecting cases, sorting cases, merging files, splitting files, Visual Binning using SPSS. **3.** Measures of Central Tendency and Measures of Dispersion for a Single Group using SPSS. **4.** Demonstration of Bar Charts, Pie Charts, and Histograms. **5.** Demonstration of Basic Hypothesis Testing using Chi- Square Test. **6.** Demonstration of Basic Hypothesis Testing using T-Test. **7.** Demonstration of Basic Hypothesis Testing using ANOVA.	**30**

Level(Semester): 6.0(II)

Course No. – 124C: Practical Based on 125 C++ Programming

Course Learning Objectives:

- Understand the fundamental principles of object-oriented programming in C++ and demonstrate the ability to create and utilize classes and objects in program design.
- Develop proficiency in defining functions both inside and outside class structures in C++ programs and comprehend their significance in code organization.
- Demonstrate the proficiency in working with default arguments within functions and understand their role in simplifying function calls and code readability.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
124C.1	Students will be able to write C++ programs that effectively utilize classes and objects to model real-world entities.	1
124C.2	Students will demonstrate proficiency in defining and using functions both within and outside class structures, including the use of default arguments and function overloading.	3
124C.3	Students will be capable of utilizing advanced C++ features, such as inheritance (single, multiple, and multilevel), constructors, destructors, virtual and pure virtual functions, templates, and exception handling in their programs.	5

Session Plan:

Topics	No. of Session
Practical Based on 125: C++Programming 1. Write C++ program to demonstrate the use of class and object 2. Write C++ program to demonstrate function definition inside and outside the class. 3. Write C++ program to demonstrate default arguments in functions. 4. Write a C++ program to demonstrate function overloading 5. Write a C++ program to demonstrate binary operator overloading using member function. 6. Write a C++ program to demonstrate binary operator overloading using friend function. 7. Write a C++ program to demonstrating the use of constructors and destructor 8. Write a C++ program to demonstrate the Single & multiple inheritance. 9. Write a C++ program to demonstrate multilevel and hierarchical inheritance 10. Write a C++ program to demonstrate role of constructor in single, multiple and multilevel inheritance. 11. Write a C++ program to demonstrate the use of virtual and pure virtual function 12. Write a C++ program to demonstrate the concept of function template & class template. 13. Write a C++ program to demonstrate Exception Handling 14. Write a C++ program to demonstrate the use of ifstream and ofstream class in file management. 15. Write a C++ program to demonstrate file management using classes.	**60**

Level (Semester): 6.0(II)

Course No: 125 C++ programming

Course Learning Objectives:

- To understand the fundamental concepts and historical development of C++ as an object-oriented programming language.
- To proficiently utilize classes and objects, including access specifiers and constructor/destructor, for effective implementation of object-oriented programs.
- To demonstrate mastery in polymorphism through function and operator overloading, as well as virtual and pure virtual functions.
- To comprehend the principles and types of inheritance in C++ and utilize them for code reuse and extensibility.
- To gain proficiency in using templates for generic programming and effectively handle exceptions to ensure robustness in C++ programs.
- To demonstrate competence in file streams and file handling operations.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
125.1	Students will analyze the historical development of C++ and its transition to an Object-Oriented Paradigm, demonstrating a comprehensive understanding of the language's evolution.	Analyze 4
125.2	Students will design and implement classes and objects in C++, utilizing appropriate access specifiers, constructors, and destructors to achieve data encapsulation and abstraction, showcasing proficiency in object-oriented programming principles.	Create 5
125.3	Students will evaluate and apply different forms of polymorphism in C++, including function overloading, operator overloading (both unary and binary), and virtual functions, demonstrating a high-level comprehension of how these features enhance code flexibility and reusability.	Evaluate 6

Reference Books:

- C++ Primer by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo (ISBN: 978-1118539974)
- C++ Programming: From Problem Analysis to Program Design by D. S. Malik (ISBN: 978-0133761361)
- Thinking in C++ by Bruce Eckel (ISBN: 978-0131849684)
- C++ How to Program by Paul Deitel and Harvey Deitel (ISBN: 978-1118039903)
- Starting Out with C++: From Control Structures through Objects by Tony Gaddis and Judy Walters (ISBN: 978-1118134858)
- C++ in One Hour a Day, Sams Teach Yourself by Siddhartha Rao and Jesse Liberty (ISBN: 978-0672337626)
- Modern C++ Programming by Nicolai M. Josuttis (ISBN: 978-1118443505)
- C++ Concurrency in Action by Anthony Williams (ISBN: 978-1933988774)
- Effective Modern C++ by Scott Meyers (ISBN: 978-1492052994)
- C++17: The Complete Guide by Nicolai M. Josuttis (ISBN: 978-1492034764)
- Object Oriented Programming with C++ by E. Balagurusamy, McGraw Hill (ISBN: 978-0070669079)
- Mastering C++ by K R Venugopal Tata McGraw-Hill, NewDelhi. (ISBN: 978-0070623949)
- The C++ Programming Language –Bjarne Stroustrup (ISBN: 978-0131103628)

Session Plan :

Topics	Readings / Activity	No. of Session
UNIT 1: Introduction • History of C++ • Introduction to Object-Oriented Paradigm • Need Object-Oriented Programming • Characteristics of Object-Oriented Programming • Structured Vs Object-oriented development • OOP's Features- Object, Classes, Data Encapsulation & Abstraction, Delegation, Inheritance, Polymorphism, Message Communication	**Reading Ref –** ➢ C++ Primer ➢ Thinking in C++ ➢ Object-Oriented Programming with C++ **Activity –** Reflect on a real-world scenario and identify how the principles of object-oriented programming (OOP) can be applied to model the entities and interactions involved in that scenario	**10**
UNIT 2: Classes and Objects • Access Specifier • Class Specification- Defining Members • Creating Objects • Constructors, Types of Constructors, Destructor • Friend Class and Friend Function	**Reading Ref –** ➢ C++ Primer ➢ Thinking in C++ ➢ Effective Modern C++ **Activity –** Simple Activity: Write a C++ program that demonstrates the concept of access specifiers and friend functions.	**10**

UNIT 3: Polymorphism • Function Overloading • Operator Overloading - unary, binary operators, using friend functions, without using a friend functions • Virtual & Pure Virtual functions	**Activity –** Implement a simple program that demonstrates function overloading and operator overloading (both unary and binary operators) using classes and objects in C++. ➢ **First Internal Test:**	**10**
UNIT 4: Inheritance • Definition and Concept • Benefits of Inheritance • Types of Inheritance • Member Accessibility • Visibility Modes • Virtual Base Class • Abstract class	**Reading Ref –** ➢ C++ Primer ➢ Thinking in C++ ➢ Mastering C++ **Activity –** Write a C++ program that demonstrates the concept of inheritance by creating a base class and at least two derived classes. Use different visibility modes and show how member accessibility works in each case.	**10**
UNIT 5: Templates & Exception Handling • Template concepts, Advantages of using Templates • Class Template • Function Template • Exception Handling	**Reading Ref –** ➢ C++ Primer ➢ Thinking in C++ ➢ Effective Modern C++ **Activity –** Implement a function template that calculates the average of an array of numbers and use exception handling to handle any errors that may occur during the calculation process.	**10**
UNIT 6: File Streams and File Handling • Introduction to file streams (ifstream and ofstream) • Opening and closing files for input and output operations • Understanding file modes for different operations (e.g., read, write, append) • Reading data from text files using ifstream • Writing data to text files using ofstream	**Activity –** Create a C++ program that reads data from an input text file using ifstream and then writes the data to an output text file using ofstream. ➢ **Second Internal Test**	**10**

Level (Semester): 6.0(II)
CourseNo:126- Internship in Industry

Course Learning Objectives:

- To acquaint the students with the scientific and history of operating system.
- To enable students to develop their various operating system knowledge.
- To enhance operating system programming.

Course Learning Outcomes:

The successful completion of this course enables the students

CLO No.	CLO	Cognitive level
126.1	To Study what is software how it works	1
126.2	To Study the GUI and Framework	3
126.3	Develop the Knowledge of Input and Output Design	5

Each student shall have to undergo a Internship work during 2ND Semester

1. In the 2ND semester examination student are required to carry out a Internship Work individually or by group of two students. It should be compulsorily based on **assessment of any IT project implemented in real time** as mentioned in the point 3. The topic should be decided with consultation and guidance of internal teacher of the Institute. The Internship work should be necessarily Research oriented, Innovative and Problem solving.

2. The Internship work should be related to **assessment of any IT project already implemented in real time** such as – e-Commerce websites, e-Governance websites, universities IT services, governments IT services, e-banking systems, railway reservation systems, bus reservation systems, online travel booking systems etc.

3. The student has to write a report based on the actual Internship work, get it certified by the concerned Guide/teacher that the Internshipwork has been satisfactorily completed and submit TWO typed copies of the same to the Head / Director of the institute /Principal of the college. One copy of the report submitted by the student shall be forwarded to the University by the Institute.

4. Internship work viva shall be conducted at the end of Semester II

5. Viva Voce for one student shall be of minimum 15 minutes. The Student has to prepare Power Point presentation based on Internship work to be presented at the time of Viva voce.

6. The Internship work will carry maximum 100 marks, of which internal teacher shall award marks out of maximum 40 marks on the basis of work done by the student. Remaining marks shall be awarded out of maximum 60 marks by examining the student during Viva voce, by the External examiner.