UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section
Email: academicsectionju14@gmail.com

CORRIGENDUM

		Please Read		Instead of	
	Semester	**Course Code/Title**		**Course Code/Title**	
BCA (Web Techonolgy)	Semester-I	UMJCST101	Web Designing	UMJBCT101	Web Designing
		UMICST102	Computer Fundamentals	UMIBCT102	Computer Fundamentals
		UMDCST103	World Wide Web and Internet	UMDBCT103	World Wide Web and Internet
		USECST104	PC Software: Installation and Troubleshooting	USEBCT104	PC Software: Installation and Troubleshooting
	Semester-II	UMJCST201	Scripting Language	UMJBCT201	Scripting Language
		UMICST202	Web Programming using PHP	UMIBCT202	Web Programming using PHP
		UMDCST203	Introduction to Web Designing	UMDBCT203	Introduction to Web Designing
		USECST204	Cyber Security	USEBCT204	Cyber Security
BCA (Data Science)	Semester-I	UMJCST131	Problem Solving using C	UMJBCT131	Problem Solving using C
		UMICST132	Data Science Basics	UMIBCT132	Data Science Basics
		UMDCST133	Data Mining and Data Warehousing	UMDBCT133	Data Mining and Data Warehousing
		USECST104	PC Software: Installation and Troubleshooting	USEBCT104	PC Software: Installation and Troubleshooting
	Semester-II	UMJCST231	Introduction to Data Science	UMJBCT231	Introduction to Data Science
		UMICST232	Python Programming	UMIBCT232	Python Programming
		UMDCST233	Introduction to Machine Learning	UMDBCT233	Introduction to Machine Learning
		USECST204	Cyber Security	USEBCT204	Cyber Security
BCA (Software Development)	Semester-I	UMJCST161	Programming Paradigms & C Language	UMJBCT161	Programming Paradigms & C Language
		UMICST162	Computer Fundamentals and PC Software	UMIBCT162	Computer Fundamentals and PC Software
		UMDCST163	Computer Fundamentals	UMDBCT163	Computer Fundamentals
		USECST104	PC Software: Installation and Troubleshooting	USEBCT104	PC Software: Installation and Troubleshooting

UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section
Email: academicsectionju14@gmail.com

	Semester-II	UMJCST261	Data and File Structures using C Language	UMJBCT261	Data and File Structures using C Language
		UMICST262	Python Programming	UMIBCT262	Python Programming
		UMDCST263	C-Progrartmming	UMDBCT263	C-Progrartmming
		USECST204	Cyber Security	USEBCT204	Cyber Security

as already notified vide notification No. F.Acd/II/22/9306-9345 dated 07.11.2022 in the Syllabi and Courses of Studies of semester Ist and IInd for **Four Year Under Graduate Programme** of **Bachelor of Computer Applications** (FYUGP-BCA) under the Choice Based Credit System as per **NEP-2020 (as given in the Annexure)**

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/22/ 10245-10255
Dated: 07-12-2022
Copy for information and necessary action to:

1. Dean, Faculty of Mathematical Science
2. HOD/Convener, Board of Studies in Computer Science & IT
3. All members of the Board of Studies
4. C.A to the Controller of Examinations
5. Director, Computer Centre, University of Jammu
6. Asst. Registrar (Conf. /Exams. UG)
7. Incharge, University Website for necessary action please.

Deputy Registrar (Academic)

07/12/22 Today 07/12/22

Bachelor of Computer Applications (BCA)

SYLLABUS

Four Year Undergraduate Programme

As per NEP 2020 guidelines

Under Choice based Credit System

FOR THE STUDENTS TO BE ADMITTED IN THE SESSIONS 2022-23, 2023-24, 2024-25

Course Details for Four-Year UG Programme

S. NO.	COURSES	DISCIPLINES
1	Computer Applications (CA)- Arts & Science	Natural Science and Arts & Humanities
2	Information Technology (IT)- Arts & Science	Natural Science and Arts & Humanities
3	**Bachelor of Computer Applications (BCA)**	Computer Applications (for BCA degree)
	BCA (Web Technology)	
	BCA (Data Science)	
	BCA (Software Development)	

Bachelor of Computer Applications (BCA)

WEB TECHNOLOGY

SCHEME

Four Year Undergraduate Programme

As per NEP 2020 guidelines

Under Choice based Credit System

FOR THE STUDENTS TO BE ADMITTED IN THE SESSIONS 2022-23, 2023-24, 2024-25

COURSES OF STUDY

Semester–I

S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
					Mid Semester	End Exam	Assessment	Exam	
1	Major	UMJCST101	Web Designing	4(3L+1P)	15	60	10	15	100
2	Minor	UMICST102	Computer Fundamentals	4(3L+1P)	15	60	10	15	100
3	MD	UMDCST103	World Wide Web and Internet	3	15	60	NA	NA	75
4	SEC	USECST104	PC Software: Installation and Troubleshooting	2	10	40	NA	NA	50

Semester–II

S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
					Mid Semester	End Exam	Assessment	Exam	
1	Major	UMJCST201	Scripting Languages	4(3L+1P)	15	60	10	15	100
2	Minor	UMICST202	Web Programming using PHP	4(3L+1P)	15	60	10	15	100
3	MD	UMDCST203	Introduction to Web Designing	3	15	60	NA	NA	75
4	SEC	USECST204	Cyber Security	2	10	40	NA	NA	50

SCHEME OF EXAMINATION

Each course shall be comprised of Mid Semester Assessment Test and End-Semester Examination. The responsibility of conduct and evaluation of the Mid Semester Assessment test lies with the Course Coordinator. The End Semester Examination shall be conducted by the University and question papers shall got set by the Controller of Examinations. The Mid Semester Assessment marks awarded to the students in each course shall be displayed on the notice board well in advance, at least one week before the commencement of End Semester examination. The 03/04 and 02 credits paper shall have 04 and 03 units, respectively.

Practicals/Tutorials as applicable in a course (Major/Minor) are extension of the theory programme in an inbuilt (3+1) credits course i.e. 03 credits of theory and 01 credit of practical/tutorial. However, 02 credits major course of 5th semester will have only theory component. Each four credits paper will have 75 Marks for theory and 25 Marks for practical/tutorial. The break-up for 75 Marks for theory paper shall contain 15 Marks for Mid Semester Assessment Test and 60 Marks for End semester Examination. There will be continuous assessment of 10 Marks and final examination of 15 Marks for Practical/Tutorial component in each course.

The 03 credits paper shall be of 75 Marks consisting of 60 Marks for external examination and 15 Marks for Mid Semester Assessment test. All 02 credits courses shall be of 50 marks comprising 40 marks for External examination and 10 Marks for Mid Semester Assessment Test.

THEORY		
DESCRIPTION	**TIME ALLOTTED**	**MARKS**
Mid Semester Assessment Test shallbe conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies.	1½ hours	15 Marks for 03/04 Credits 10 Marks for 02 Credits

End Semester University Examination shall be conducted for entire syllabus. The break up is as under:		
1. <u>03 and 04 credits papers</u> **Section A** shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.	03 hours for 03/04 credits	60 Marks for 03/04 Credits
Section B shall consistEight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.	2½ hours for 02 credits	40 Marks for 02 Credits
2. <u>02 credits papers</u> **Section A** shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 2½ Marks.		
Section B shall consistSix (6) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 10 Marks.		
Note: Convener, BOS, can make minor modification in the scheme Skill course, if required. However, it must be clearly reflected in the syllabus.		
PRACTICAL/TUTORIAL		
i. Daily evaluation of practical's/tutorials/Viva voce/Records etc.	10 Marks for Continuous assessment	
ii. Final Examination **Note: The BOS shall device the mechanism of Final examination.**	15 Marks for Final examination	

Instructions for paper setter

1. 3 / 4 Credits Paper

Total marks: 60
Time allotted: 3 hours
The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

Section A

Total of Four (4) short answer questions (one from each unit) shall be set. The candidates are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B

Total of Eight (8) long answer questions (two from each unit) shall be set. The candidates are required to attempt four questions. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

2. 2 Credits Paper

Total marks: 40
Time allotted: 2½ hours
The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

Section A

Total of Four (4) short answer questions (at least one from each unit) shall be set. The candidates are required to attempt all questions. Each question shall be of 2½ Marks.

(4 x 2½ = 10 marks)

Section B

Total of Six (6) long answer questions (two from each unit) shall be set. The candidates are required to attempt three questions. Each question shall be of 10 Marks.

(3 x 10 = 30 marks)

Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology) - FIRST SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Web Designing
Course Code: UMJCST101
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2022, 2023, and 2024

Course objectives & learning outcomes:

1. To learn the fundamentals of Internet.
2. To understand basic web fundamentals.
3. To gain knowledge on HTML and CSS style sheets
4. To brief the students about java script and constructs.

UNIT – I

The basics of Internet, World Wide Web, Static, Dynamic and Active web page, Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.

15 Hours

UNIT - II

Web Browser, Installing and setting up browsers, cookies, security features in Browsers, Client-Side Scripting Languages- VB Script and Java Script, Active X control and Plug-ins, Web Server Architecture, Image maps, CGI, API web database connectivity-DBC, ODBC

15 Hours

UNIT - III

Introduction to HTML, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Design Tables and Forms, Lists and their Types, Image Tag, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Creating Table, Frame, Form and Style Sheet, Dynamic HTML, Document Object Model, Features of DHTML, Introduction to CSS, and its types (Inline, Internal and External), Text boxes, Pseudo Classes, Selectors, Animations, Transitions etc.

15 Hours

UNIT – IV

Introduction to Java Script, Embedding JavaScript in HTML, Objects, Methods, Events and Functions, Tags, Operators, Data Types, Literals and Type Casting in JavaScript, Programming Construct, Array and Dialog Boxes, Relating JavaScriptto DHTML, Dynamically Changing Text, Style, Content

15 Hours

Suggested readings/ references:

1. Achyut Godbole and Atul Kahate, "Web Technologies", McGraw Hill.
2. Burdman, "Collaborative Web Development", Addison Wesley.
3. Jeffrey C. Jackson, "WebTechnologies", Prentice Hall
4. Sharma &Sharma, "Developing E-Commerce Sites", Addison Wesley
5. Ivan Bayross, "Web Technologies Part II", BPB Publications.

BCA (Web Technology) - FIRST SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Web Designing
Course Code: UMJCST101
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2022, 2023, and 2024

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - FIRST SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Computer Fundamentals.
Course Code: UMICST102
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2022, 2023 and 2024

Course objectives & learning outcomes:

1. To learn the fundamentals of Computer Fundamentals.
2. To learn the concepts of number system and operating system.
3. To gain knowledge on software and applications.
4. To brief the students about word processing and editing tools.

UNIT - I

The basics of Internet, World Wide Web, Static, Dynamic and Active web page, Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.

15 Hours

UNIT - II

Software and its Types (System Software, Application Software, Firmware Software) Computer Languages and its types (Machine Language, Assembly Language, High Level Language: Merits and Demerits of Computer Languages), Translators: Compiler, Linker, Interpreter, Loader, computer virus and its types (Trojan, Malware, Spyware etc.), Antivirus Software

15 Hours

UNIT – III

Number system: Decimal, Binary, Octal, Hexadecimal, Conversion of one number system to another, arithmetic operations,Complement,Introduction to operating system,Architecture,Types of Operating System,Parallel, Distributed & Real time Operating System,Multiprogramming,Multitasking, Time sharing,Memory Management,File Management.

15 Hours

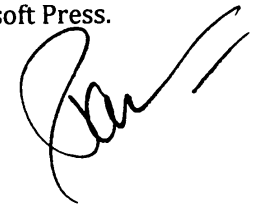
UNIT – IV

Using Word Processing: Features of Word processing software, Opening and Closing of documents, Text creation and Manipulation, Formatting of text, Table handling, Spell check, language setting and thesaurus, Using Spreadsheet tool: Basics of Spreadsheet, features, Formulas and Functions, header and footer, deleting or Inserting Cells, Rows and Columns, Goal Seek, Sorting and Filter, Creating charts.Using Slide Presentation Tool: Basics of PowerPoint, Preparation and Presentation of Slides, Master Slides, setup Slide Show, Formatting and Clip Arts, PowerPoint Views, Assigning Slide Transitions, Header/Footer, Word Art, Templates.

15 Hours

Suggested readings/ references:

1. P.K Sinha and Priti Sinha, "Computer Fundamentals", BPB Publications.
2. Alexix Leon and Mathewes Leon,"Fundamentals of Information Technology",Leon TechWorld
3. Suresh K. Basandra, "Computer Systems Today", Galgotia Publications.
4. V. Rajaraman, "Fundamentals of Computers", IEEE.
5. Peter Nortan,"Introduction to Computers", Tata McGraw Hill
6. Joyce Coax et al., "Microsoft Office System step by step", Microsoft Press.



BCA (Web Technology) - FIRST SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Computer Fundamentals.
Course Code: UMICST102
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2022, 2023 and 2024

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology)-FIRST SEMESTER

Course: Multidisciplinary Foundation Course (MD)
Course Credits: (L-P-T)
(3-0-0)
Total marks: 75

Course Title: World Wide Web and Internet
Course Code: UMDCST103
Mid Semester assessment: **15 Marks of 1.5 hours duration**
End Semester assessment: **60 Marks of 3.0 hours duration**

For examinations to be held in Dec 2022, 2023 and 2024

Course objectives & learning outcomes:

1. To understand basic web fundamentals.
2. To understand concepts of mailing protocols.
3. To gain knowledge on network protocols and their applications.
4. To brief the students about web designing concepts.

UNIT - I

Web Browser, Installing and setting up WebBrowsers, Client -Side Scripting Languages-VBScript and Java Script, Server-Side Scripting languages, ActiveXControls and Plug-ins, WebServer Architecture.

10 Hours

UNIT - II

The basics of Internet, World Wide Web, Web page, Home page, Web site, Static, Dynamicand Active web page, Overview of Protocols - Simple Mail Transfer Protocol, Gopher,Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.

10 Hours

UNIT - III

Electronic mail (E-mail), Usenet and newsgroup, File Transfer Protocol (FTP), Telnet, Finger, Internet Chat (IRC), Frequently asked questions (FAQ), The World Wide Web Consortium (W3C) - Origin and evolution,Standardizing the Web,W3C members, W3C recommendations, Browsing and searching, Browsing and information retrieval, Exploring the World Wide Web, Architecture of World Wide Web, Hyperlink, Hypertext Transfer Protocol (HTTP), URL.

10 Hours

UNIT - IV

WWW operations, Web standards, HTML - concept and version, Naming scheme for HTML Documents, HTML editor,Elements in HTML documents, XHTML, CSS, Extensible Stylesheet Language (XSL),Tips for designing Web pages, Web Authoring Tools and types.

15 Hours

Suggested readings/ references:

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Deitel, "Internet and World Wide Web: How to program",Pearson Publications.
3. Sharma &Sharma, "Developing E-Commerce Sites", Addison Wesley
4. Ivan Bayross, "Web Technologies Part II", BPB Publications.

BCA (Web Technology)–FIRST SEMESTER

Course: Multidisciplinary Foundation Course (MD)
Course Credits: (L-P-T)
(3-0-0)
Total marks: 75

Course Title: World Wide Web and Internet
Course Code: UMDCST103
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration

For examinations to be held in Dec 2022, 2023 and 2024

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology)–FIRST SEMESTER

Course:	Skill Enhancement Course (SEC)	Course Title: PC Software: Installation and Troubleshooting	
Course Credits:	(L-P-T)	Course Code: USECST104	
	(2-0-0)	Mid Semester assessment:	10 Marks of 1.5 hours duration
Total marks:	50	End Semester assessment:	40 Marks of 2.5 hours duration

For examinations to be held in Dec 2022, 2023, and 2024

Course objectives & learning outcomes:

1. To provide knowledge about the PC Hardware.
2. To brief about different utilities and PC settings.
3. To develop the ability to configure, setup and troubleshoot PC.

UNIT -I

Introduction to PC Hardware: Study of basic I/O systems, Types of Memories- Static RAM and Dynamic RAM, ROM, PROM, EPROM, EEPROM, External Storage Devices, CPU (Central Processing Unit)- ALU and control, Motherboard and Processor :Types of Processor, System performance Motoring. 10 Hours

UNIT -II

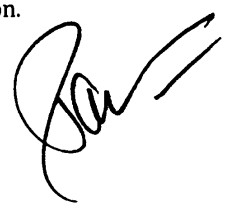
BIOS Configuration: Study of BIOS Set-up- Advance set-up, Boot configuration, Boot Menu, Installation of Operating System (Windows), Control panel, Installation and uninstallation of application software, Setting System Date and Time, Hard Disk: Formatting of Hard disk, Partitioning of Hard disk in different logical drives, Defragmenting Hard disk using defrag, Scan Disk for checking disk space, Disk clean up, Scan disk, Installation of Device Drivers: Different types of Motherboard drivers: Network, Audio, and Graphics, Modem. Display Settings: Resolution, Themes, multiple displays, Projector Set up. 10 Hours

UNIT-III

Configuration of External devices: Physical set-up of Printers- Performing test print out, Printing of document etc, Scanner set-up, Webcam, Bluetooth device, Memory card reader, Diagnostic and troubleshooting of PC: POST (Power on Self Test), Maintenance of PC, Error messages, Task Manager. Concept of compression Compression Utilities: WinZip, PKZIP, files recovery, Antivirus, CD/DVD Writing Software, Concept of Virtual drives and Image files (ISO). 10 Hours

Suggested readings/ references:

1. Mark Minasi, "The complete PC Upgrade & Maintenance Guide", BPB Publications.
2. D Balasubramanian, "Computer Installation and Servicing", Tata McGraw Hill Education.
3. Robert C. Brenner, "Trouble Shooting and Repair Guide", BPB Publications.
4. Scott Mueller, "Upgrading and Repairing PC's", PHI Publications, Fourth Edition.
5. Adane Nega Tarekegn, "A Simple Guide to Computer Maintenance and Troubleshooting", LAP LAMBERT Academic Publishing.
6. James Karney, "Upgrade & Maintain Your PC", M & T Books; 2nd edition.



BCA (Web Technology)–FIRST SEMESTER

Course:	Skill Enhancement Course (SEC)	Course Title: PC Software: Installation and Troubleshooting	
Course Credits:	(L-P-T)	Course Code: USECST104	
	(2-0-0)	Mid Semester assessment:	10 Marks of 1.5 hours duration
Total marks:	50	End Semester assessment:	40 Marks of 2.5 hours duration

For examinations to be held in Dec 2022, 2023, and 2024

NOTE FOR PAPER SETTERS FOR EXAMINATIONS -

The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

Section A shall consist Four (4) short answer questions (at least one from each unit). The students are required to attempt all questions. Each question shall be of 2½ Marks.

(4 x 2½ = 10 marks)

Section B shall consist Six (6) long answer questions (two from each unit). The students are required to attempt three questions. Each question shall be of 10 Marks.

(3 x 10 = 30 marks)

Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology)-SECOND SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Scripting languages
Course Code: UMJCST201
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To understand basic web fundamentals.
2. To learn object-oriented programming concepts.
3. To gain knowledge on server-side scripting.
4. To brief the students about server connectivity.

UNIT – I

Introduction to JavaScript, Variables in JavaScript, Statements, Operators, Comments, Expressions, and Control Structures. JavaScript Scopes, Strings, String Methods, Numbers, Number Methods, Boolean Values, Dates, Date Formats, Date Methods, Arrays, Array Methods.
Objects, Object Definitions, Object Properties, Object Methods, Object Prototypes. Functions, Function Definitions, Function Parameters, Function Invocation, Function Closures.

15 Hours

UNIT – II

Introduction to Object Oriented Programming in JS: Method, Constructor, Inheritance, Encapsulation, Abstraction, Polymorphism.
Document Object Model (DOM), Object hierarchy in JavaScript, DOM Elements, DOM Events, DOM Methods, DOM Manipulation. Forms, Forms API, Forms Validation, Regular Expressions, Errors, Debugging.

15 Hours

UNIT – III

Introducing to jQuery, jQuery selectors, jQuery events, jQuery animation effects, jQuery DOM traversal and manipulation, Data attributes and templates, jQuery DOM utility functions, jQuery plugins.
JSON: JavaScript Object Notation (JSON), Introduction and need of JSON, JSON Syntax Rules, JSON Data - a Name and a Value, JSON Objects, JSON Arrays, JSON Files, JSON Parsing
Ajax: Introduction to Ajax, Ajax Framework, Ajax Architecture, Web services and Ajax, Ajax using JSON and jQuery.

15 Hours

UNIT – IV

Introduction to Node.js, Browser JS vs. Node.js, ECMAScript 2015 (ES6), Node.js REPL.
Introduction to Asynchronous programming and callbacks, Promises and async & await, The Event Loop and Timers.
Understanding Node modules, exportsand require.Introduction to npm: package. json and package-lock.json files, Install, update, and manage package dependencies, Local and global packages

15 Hours

Suggested Readings:

1. Paul Deitel, Henry Deitel & Abbey Deitel,"Internet & World Wide Web", Pearson Education
2. Deitel et al., "XML - How to Program",Pearson Education
3. Douglas Crockford, "JavaScript: The Good Parts", O'Reilly
4. Vasan Subramanian, "Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, andNode", Apress.

BCA (Web Technology)–SECOND SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Scripting languages
Course Code: UMJCST201
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology)-SECOND SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Web Programming using PHP
Course Code: UMICST202
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To learn the fundamentals of programming language.
2. To understand the concept of different control structures.
3. To learn about different data structures
4. To understand the concept of procedural programming.

UNIT – I

The basics of Internet, World Wide Web, Static, Dynamic and Active web page, Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.

15 Hours

UNIT – II

Fundamentals of HTML, Text formatting tags, Inserting Images, Links, Lists, Creating Tables, Frames, Forms, Anchors and URLs, Links to External Documents, Creating Table, Frame, Form and Style Sheet, Dynamic HTML, Document Object Model.

15 Hours

UNIT – III

CSS and its types (Inline, Internal and External), Text boxes, Selectors, Introduction to Java Script, Objects, Methods, Events and Functions, Tags, Operators, Data Types, Literals and Type Casting in JavaScript, Programming Construct, Array and Dialog Boxes, Relating JavaScript to DHTML

15 Hours

UNIT – IV

Introduction to PHP, Basic data types and Functions, Passing Information between web pages, GET, POST, Session, Cookie Management, Error handling, PHP functions for database connectivity,Updation and deletion of data using PHP,Displaying data from database in webpage.

15 Hours

Suggested readings/ references:

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Jeffrey C. Jackson, "Web Technologies", Prentice Hall.
3. Ivan Bayross, "Web Technologies Part II", BPB Publications.
4. Rasmus Ledroff, "Programming PHP",O'Reilly.

BCA (Web Technology)-SECOND SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Web Programming using PHP
Course Code: UMICST202
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc. 10 marks

Final Examination 15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - SECOND SEMESTER

Course: Multidisciplinary Foundation Course (MD)
Course Credits: (L-P-T)
(3-0-0)
Total marks: 75

Course Title: Introduction to Web Designing
Course Code: UMDCST203
Mid Semester assessment: 15 **Marks of 1.5 hours duration**
End Semester assessment: 60 **Marks of 3.0 hours duration**

For examinations to be held in May 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To understand basic web fundamentals.
2. To understand concepts of mailing protocols.
3. To gain knowledge on network protocols and their applications.
4. To brief the students about web designing and scripting concepts.

UNIT - I

Basics of Internet, World Wide Web, Overview of Protocols like http, ftp etc. Web Browser, Installing and Setting up a Browsers,Client-Side Scripting Languages-VBScript and Java Script, Active Xcontrol and Plug-ins, WebServer Architecture, Image maps,CGI and basics.

10 Hours

UNIT - II

Introduction to HTML, Essential Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag, Hypertext, Hyperlink and Hypermedia, Links, Creating Table, Frame, Form and Style Sheet.

10 Hours

UNIT – III

Introduction to CSS and types, External, Internal and embedded Stylesheet, CSS text boxes,Tables, Animations and other tags.

10 Hours

UNIT – IV

Introduction to Java Script, Java ScriptObjects, Methods, Events and Functions, Tags, Operators, Data Types, Literals and Type Casting in JavaScript, Programming Construct, Array, Dialog Boxes,Dynamically Changing Text, Style, Content.

15 Hours

Suggested readings/ references:

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Sharma &Sharma, "Developing E-Commerce Sites", Addison Wesley
3. Ivan Bayross, "Web Technologies Part II", BPB Publication

BCA (Web Technology) - SECOND SEMESTER

Course: Multidisciplinary Foundation Course (MD)
Course Credits: (L-P-T)
(3-0-0)
Total marks: 75

Course Title: Introduction to Web Designing
Course Code: UMDCST203
Mid Semester assessment: 15 **Marks of 1.5 hours duration**
End Semester assessment: 60 **Marks of 3.0 hours duration**

For examinations to be held in May 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology) - SECOND SEMESTER

Course:	Skill Enhancement Course (SEC)	Course Title: Cyber Security	
Course Credits:	(L-P-T)	Course Code: USECST204	
	(2-0-0)	Mid Semester assessment:	10 Marks of 1.5 hours duration
Total marks:	50	End Semester assessment:	40 Marks of 2.5 hours duration

For examinations to be held in May 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To provide knowledge about the PC Hardware.
2. To brief about different utilities and PC settings.
3. To develop the ability to configure, setup and troubleshoot PC.

UNIT –I

Cyberspace, Architecture of cyberspace, Internet, World Wide Web, Advent of internet, Internet infrastructure for data transfer and governance, Internets ociety, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.

Classification of cyber crimes, Common cyber crimes-cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks. 10 Hours

UNIT -II

Cybercriminals modus-operandi, Reporting of cyber crimes, Remedial and mitigation measures, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences, Organizations dealing with Cyber crime and Cyber security in India.

Introduction to Social networks, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media.

10 Hours

UNIT-III

Definition of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E-Commerce security best practices.

Introduction to digital payments, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in authorized banking transactions

10 Hours

Suggested readings/ references:

1. R. C Mishra, "Cyber Crime Impact in the New Millennium", Auther Press Edition.
2. Sumit Belapure and Nina Godbole, "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley India Pvt. Ltd.
3. Henry A. Oliver, "Security in the Digital Age: Social Media Security Threats and Vulnerabilities", Pearson.
4. Elias M. Awad, "Electronic Commerce", Prentice Hall of India Pvt Ltd.
5. Kumar K, "Cyber Laws: Intellectual Property & E-Commerce Security", Dominant Publishers.
6. Eric Cole, Ronald Krutz, James W. Conley, "Network Security Bible", 2nd Edition, Wiley India Pvt. Ltd.
7. E. Maiwald, "Fundamentals of Network Security", McGraw Hill.

BCA (Web Technology) - SECOND SEMESTER

Course: Skill Enhancement Course (SEC)
Course Credits: (L-P-T)
(2-0-0)
Total marks: 50

Course Title: Cyber Security
Course Code: USECST204
Mid Semester assessment: 10 Marks of 1.5 hours duration
End Semester assessment: 40 Marks of 2.5 hours duration

For examinations to be held in May 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS -

The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

Section A shall consist Four (4) short answer questions (at least one from each unit). The students are required to attempt all questions. Each question shall be of 2½ Marks.

(4 x 2½ = 10 marks)

Section B shall consist Six (6) long answer questions (two from each unit). The students are required to attempt three questions. Each question shall be of 10 Marks.

(3 x 10 = 30 marks)

Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology) -THIRD SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Fundamentals of Operating System
Course Code: UMJCST301
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To learn the fundamentals of Operating System.
2. To understand different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
3. To gain knowledge on memory management concepts.
4. To brief the students about different file handling techniques.

UNIT – I

Introduction to Operating System: Definition, Types of Operating Systems: Batch Systems, Concepts of Multiprogramming and Time Sharing, and Real Time Systems. Operating System Structures and Services.

15 Hours

UNIT - II

Process Management: Process Concepts, Process States and Process Control Block.
CPU Scheduling: Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Priority, and Round Robin.
Deadlocks: Deadlock Characterization, Resource allocation graph, Deadlock Prevention and Avoidance.

15 Hours

UNIT - III

Memory Management: Logical and Physical Address Space, Swapping, Contiguous and Non- Contiguous Allocation, Paging, Segmentation, Demand Paging
Page Replacement Algorithms: FIFO, Optimal, LRU, Thrashing,

15 Hours

UNIT – IV

File System and Management: File Concepts, Access Methods, Directory Structure, Protection and Consistency, File System Structure, Allocation Methods: Continuous Allocation, Chained Allocation and Indexed Allocation.
Introduction to LINUX/UNIX: Various Parts of Operating System, Kernel, Important Parts of Kernel, Commands: pwd, mkdir, rmdir, 1s, cat, more, less, mv, cp, rm, pwd, who, write, who am i, passwd, ps, kill, date. cal, man, banner, Regular Expression: grep, fgrep

15 Hours

Suggested readings/ references:

1. Operating Systems Concepts – Silberschatz, Galvin and Gagne, Wiley Publications
2. Operating Systems: A Concept based Approach – D M Dhamdhere, 2nd Edition.
3. Sumitabha Das, "Unix concept and Programming", McGraw Hill education, 4th Edition, 2015.

BCA (Web Technology) - THIRD SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Fundamentals of Operating System
Course Code: UMJCST301
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) -THIRD SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Database Management System
Course Code: UMJCST302
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To learn the fundamentals of DBMS
2. To understand the relational database design principles.
3. To gain knowledge on basic issues of transaction processing and concurrency control
4. To brief the students about SQL programming.

UNIT – I

Introduction: Basic Concept and Definitions, Data and Information, Data Dictionary, Data Item or Field, Entity & attributes, Record, Applications of DBMS, File Processing System versus DBMS, Advantages and Disadvantages of DBMS, Architecture of DBMS, Users of DBMS, Views of Data

15 Hours

UNIT - II

Relational DBMS: Definition, Concept of Table, Relation, Tuple, Attribute, Various keys, Role of Database administrator, Data Models, Entity Relationship Diagram (ERD), Relational Algebra Operations.

15 Hours

UNIT - III

Normalization: Anomalies and data redundancies in Database, Dependencies [functional, fully functional and minimal/irreducible set], Normal forms [1st, 2nd, 3rd, BCNF]

15 Hours

UNIT – IV

Overview of SQL: Introduction of SQL, History of SQL, Data types in SQL, Table creation, insertion, deletion, alteration and retrieval of data from table, Table deletion, simple & nested queries using DDL, DML and DCL commands, SQL queries using conditions like where, where-like, order by, greater than, less than, if-then, if-then-else, if-then else if, data integrity constraints, views, joins.

15 Hours

Suggested readings/ references:

1. Elmsari and Navathe, "Fundamental of Database System", Addison Wesley. New York.
2. H.Korth & A. Silberschatz, "Database System Concepts", TMH.
3. Date. CJ, "An Introduction to Database System", Narosa Publishing House. New Delhi.
4. Desai, B, "An Introduction to Database Concepts", Galgotia Publications. New Delhi

BCA (Web Technology) - THIRD SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Database Management System
Course Code: UMJCST302
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc. 10 marks

Final Examination 15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - THIRD SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Object Oriented Programming using C++
Course Code: UMICST303
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To learn the fundamentals of Object oriented programming.
2. To learn basic object oriented concepts like data abstraction, encapsulation etc.
3. To gain knowledge on object and class concepts.
4. To brief the students about Inheritance and its types.

UNIT – I

The Object Oriented Methodology: Paradigms of Programming Languages, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Applications of OOPs.

15 Hours

UNIT - II

Language Basics: Basic program construction, data types: integer, character, float, double, long double and Boolean. Input output statements: cin, cout, comments, escape sequence, manipulators, type conversion, arithmetic, logical and relational operators. For loop, while loop & do loop and if, if...else, switch control statements. Structures, Functions: passing arguments to functions, returning values from functions, reference arguments, overloaded functions, inline functions, default arguments, variables and storage class and returning by reference.

15 Hours

UNIT – III

Objects And Classes: A simple class, C++ objects as physical objects, object as function argument, constructors as function argument, overloaded constructors, copy constructors, returning objects from functions, structures and classes, static class data, const and classes, Arrays and Strings.

15 Hours

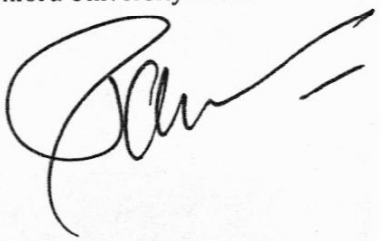
UNIT – IV

Inheritance: derived class and base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, level of inheritance, multiple inheritance, new and delete operator.

15 Hours

Suggested readings/ references:

1. Robert Lafore, " Object Oriented Programming in C++" Techmedia Publication.
2. Herbert Shieldt, " The complete reference C" Tata McGraw Hill Publication.
3. Saurav Sahay, "Object Oriented Programming in C++", Oxford University Press.



BCA (Web Technology) - THIRD SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Object Oriented Programming using C++
Course Code: UMICST303
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in Dec 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - THIRD SEMESTER

Course: Multidisciplinary (MD)
Course Credits: (L-P-T)
(3-0-0)
Total marks: 75

Course Title: World Wide Web and Internet
Course Code: UMDCST304
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration

For examinations to be held in Dec 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To understand basic web fundamentals.
2. To understand concepts of mailing protocols.
3. To gain knowledge on network protocols and their applications.
4. To brief the students about web designing concepts.

UNIT - I

Web Browser, Installing and setting up Web Browsers, Client -Side Scripting Languages-VBScript and Java Script, Server-Side Scripting languages, ActiveX Controls and Plug-ins, Web Server Architecture.

10 Hours

UNIT - II

The basics of Internet, World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.

10 Hours

UNIT – III

Electronic mail (E-mail), Usenet and newsgroup, File Transfer Protocol (FTP), Telnet, Finger, Internet Chat (IRC), Frequently asked questions (FAQ), The World Wide Web Consortium (W3C) – Origin and evolution, Standardizing the Web, W3C members, W3C recommendations, Browsing and searching, Browsing and information retrieval, Exploring the World Wide Web, Architecture of World Wide Web, Hyperlink, Hypertext Transfer Protocol (HTTP), URL.

10 Hours

UNIT – IV

WWW operations, Web standards, HTML – concept and version, Naming scheme for HTML Documents, HTML editor, Elements in HTML documents, XHTML, CSS, Extensible Stylesheet Language (XSL), Tips for designing Web pages, Web Authoring Tools and types.

15 Hours

Suggested readings/ references:

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Deitel, "Internet and World Wide Web: How to program", Pearson Publications.
3. Sharma &Sharma, "Developing E-Commerce Sites", Addison Wesley
4. Ivan Bayross, "Web Technologies Part II", BPB Publications.

BCA (Web Technology)–THIRD SEMESTER

Course: Multidisciplinary (MD)
Course Credits: (L-P-T)
(3-0-0)
Total marks: 75

Course Title: World Wide Web and Internet
Course Code: UMDCST304
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration

For examinations to be held in Dec 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology) - THIRD SEMESTER

Course: Skill Enhancement Course (SEC)
Course Credits: (L-P-T)
(2-0-0)
Total marks: 50

Course Title: System Analysis and Design
Course Code: USECST305
Mid Semester assessment: 10 Marks of 1.5 hours duration
End Semester assessment: 40 Marks of 2.5 hours duration

For examinations to be held in Dec 2023, 2024 and 2025

Course objectives & learning outcomes:

1. To learn the basics of Software and system development life cycle.
2. To learn different SRS and feasibility study.
3. To gain knowledge on DFDs, ER diagrams and tools.

Unit-1

Software Systems Analysis and Design Life Cycle: Requirements determination, requirements specifications, feasibility analysis, final specifications, hardware and software study, Software system design, Software system implementation, Software system evaluation, Software system modification.

15 Hours

Unit-II

Role of Software systems analyst, tools used in Software system analysis Information gathering: strategies, methods, case study Software system requirements specification: classification of requirements as strategic, tactical, operational and statutory. Feasibility analysis: deciding project goals, examining alternative solutions, cost – benefit analysis.

15 Hours

Unit-III

Tools for systems analysts: data flow diagrams, case study for use of DFD, leveling of DFDs, leveling rules, logical and physical DFDs, software tools to create DFDs. Data oriented Software systems design: entity relationship model, E-R diagrams, relationships, cardinality and participation, data base design.

15 Hours

Suggested Readings:

1. Software Engineering by Roger S. Pressman- Tata McGraw Hill.
2. Software Project Management by Bob Hughes and Mike Cotterell- Tata McGraw Hill.
3. Software Project Management by S. Kelkar- PHI.
4. Information Technology Project Management by Kathey and Schwalbe Thomson Learning
5. An Integrated Approach to Software Engineering by P. Jalote- PHI.

BCA (Web Technology) - THIRD SEMESTER

Course: Skill Enhancement Course (SEC)
Course Credits: (L-P-T)
(2-0-0)
Total marks: 50

Course Title: System Analysis and Design
Course Code: USECST305
Mid Semester assessment: 10 Marks of 1.5 hours duration
End Semester assessment: 40 Marks of 2.5 hours duration

For examinations to be held in Dec 2023, 2024 and 2025

NOTE FOR PAPER SETTERS FOR EXAMINATIONS -

The question paper will be divided into the following two sections. No question shall be repeated in the question paper.

Section A shall consist Four (4) short answer questions (at least one from each unit). The students are required to attempt all questions. Each question shall be of 2½ Marks.

(4 x 2½ = 10 marks)

Section B shall consist Six (6) long answer questions (two from each unit). The students are required to attempt three questions. Each question shall be of 10 Marks.

(3 x 10 = 30 marks)

Note: The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

BCA (Web Technology)–FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Express Frameworks
Course Code: UMJCST401
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2024, 2025 and 2026

Course objectives & learning outcomes:

1. To understand basic installation process of Express Framework.
2. To learn about various templates, data handling and storage concepts.
3. To brief the students about various security and authentication mechanisms in Express applications.

UNIT – I

Introduction to Express: Overview of Express, Installing Express and creating a project, Basic routing using Express, Understanding middleware in Express.

15 Hours

UNIT – II

Views and Templates: Introduction to Views and Templates, Using Pug (formerly known as Jade) for templating, creating views and templates in Express, Using layouts and partials, Handling errors and rendering error pages.

15 Hours

UNIT – III

Data handling and storage: Handling POST requests and data, Using forms to submit data to the server, Storing data in MongoDB using Mongoose, Retrieving and manipulating data from MongoDB.

15 Hours

UNIT – IV

Authentication and Security: Introduction to Authentication and Security, Using Passport.js for authentication, Using sessions and cookies, Securing your Express application, Best practices for securing your application

15 Hours

Suggested Readings:

1. Azat Mardan, "The Comprehensive Book on Express JS", LeanPub
2. Dhruti Shah, "Node.JS Guidebook", BPB Publications, 2018
3. Basarat Ali Syed, "Beginning Node.js", A press, 2014

BCA (Web Technology)–FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-1-0)
Total marks: 100

Course Title: Express Frameworks
Course Code: UMJCST401
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2024, 2025 and 2026

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology)-FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Data Structures using C
Course Code: UMJCST402
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2024, 2025 and 2026

Course objectives & learning outcomes:

1. To learn fundamentals of Data Structures and its types.
2. To understand representations of Arrays, Linked lists, Stacks, Trees etc.
3. To brief the students about sorting and searching algorithms.

UNIT – I

Introduction and Classifications of Data Structures. Data Structure operations. Time and space complexity of algorithms. Rate of Growth: Big *O* Notation. Recursion, Pointers: Definition, Initialization, Pointers arithmetic. Structures, Self Referential Structures.

15 Hours

UNIT – II

Linear Data Structures: Arrays and its representations, Stacks and Queues and its implementation using Arrays, Dynamic memory allocation, Linked lists, Linked list-based implementation of Stacks and Queues, Evaluation of Expressions, Applications of Arrays and Linked list

15 Hours

UNIT – III

Non-Linear Data Structures: Trees, Binary Trees, Binary tree representation and traversals, Binary Search Trees, Complete Binary Tree, Heap, Graph and its representations, Applications of trees and Graphs.

15 Hours

UNIT – IV

Sorting and Searching: Linear Search and Binary Search, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Selection Sort, Time and space complexity of sorting & search algorithms.

15 Hours

Suggested readings/ references:

1. Ashok N. Kamthane, "Introduction to Data Structures in C", Pearson Education.
2. Aaron M. Tenenbaum, "Data Structures Using C"
3. Tremblay, Jean-Paul, and Paul G. Sorenson, "An introduction to data structures with applications", McGraw-Hill

BCA (Web Technology)-FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Data Structures using C
Course Code: UMJCST402
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 Marks

For examinations to be held in May 2024, 2025 and 2026

NOTE FOR PAPER SETTERS FOR EXAMINATIONS –

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Mathematical Foundation of Computer Science
Course Code: UMJCST403
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 marks

For examinations to be held in May 2024, 2025 and 2026

Course objectives & learning outcomes:

1. To understand basic concepts of set operations and calculus.
2. To gain knowledge on Linear equations and matrices operations.
3. To brief the students about vector spaces concepts.

UNIT – I

Sets, Relations and Functions: Definition of Sets and Subsets; Intersection Union and Complements: Demorgan's Law; Cardinality; Relations - Equivalence relation etc. Mapping One-One Onto etc.

15 Hours

UNIT - II

Calculus: Functions; Limits and Continuity; Differentiation and Integration; Differential Equations of first Order and first degree.

15 Hours

UNIT –III

Linear equations and Matrices: Various types of Matrices, Row/Column operations Solution of linear equations Gaussian Eliminations etc. Properties of determinants; Cramer's Rule; transpose and inverse of a Matrix.

15 Hours

UNIT – IV

Vector Spaces: Definition of Vector, Scalar Product, Vector Product Linear Independence; Bases, Subspace and dimensionality Inner products and Norms.

15 Hours

Suggested Readings/ References:

1. M.R. Puri, Dr. Raí Krishan" Modern Algebra ", Malhotra Brothers.
2. A.R. Vasishtha Publisher,"Matrices", Krishna Prakashan Mandir.
3. Trembley, J.P. and Manohar, R.P," Discrete Mathematical Structures with Applications to Computer Science", McGraw-Hill, 1975.

BCA (Web Technology) - FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Mathematical Foundation of Computer Science
Course Code: UMJCST403
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical: 25 marks

For examinations to be held in May 2024, 2025 and 2026

NOTE FOR PAPER SETTERS FOR EXAMINATIONS

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc. 10 marks

Final Examination 15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - FOURTH SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Python Programming
Course Code: UMJCST404
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25 marks

For examinations to be held in May 2024, 2025 and 2026

Course objectives & learning outcomes:

1. To learn about basic concepts of Python programming
2. To brief the students about different programming constructs and data types.
3. To gain knowledge on classes and module concepts.

UNIT –I

Python introduction, Python features and Application, Basic syntax, Python data types- Numeric (int, float, complex), String data type, Boolean data type, Sequence, Set, none; Variables, Input and output, output formatting, Comments-Single and Multiline comments

Arithmetic operators, Comparison operators, Logical operators, Bitwise operators, Assignment operators, Membership Operators, Identity Operators Precedence and associativity of operators, Expressions

15 Hours

UNIT –II

Conditional statements (if-else, nested if), Looping statements (while, for, nested loops), Pass statements, comprehension

Built-in functions, User defined Functions, Defining and calling functions, Parameters and arguments, Return statement, Lambda functions, generator functions, map,

15 Hours

UNIT-III

Lists, Tuples, Sets, Dictionaries, Accessing and modifying elements; Various operations on Lists, Tuples, Sets, Dictionaries. Python file handling, Creating file, file opening modes, Reading file, Writing File, deleting file

15 Hours

UNIT-IV

Classes and object, Encapsulation, Polymorphism, class method, static method, Inheritance, Single inheritance, Multiple inheritances, Multi-level inheritance, Method Resolution Order (MRO), Polymorphism, Method overriding and overloading

Modules and Packages, modules and packages, importing modules and packages, Creating and importing custom modules, Using built-in modules and packages,

15 Hours

Suggested readings/ references:

1. Charles Dierbach, "Introduction to Computer Science Using Python", 1st Edition, Wiley India Pvt. Ltd
2. Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India, 2015.
3. Reema Thareja, "Python Programming using problem solving approach", Oxford University press, 2017

BCA (Web Technology) - SECOND SEMESTER

Course: Major
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Python Programming
Course Code: UMJCST404
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25 marks

For examinations to be held in May 2024, 2025 and 2026

NOTE FOR PAPER SETTERS FOR EXAMINATIONS -

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc. 10 marks

Final Examination 15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks

BCA (Web Technology) - FOURTH SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Internet of Things
Course Code: UMICST405
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25 Marks

For examinations to be held in May 2024, 2025 and 2026

Course objectives & learning outcomes:

1. To learn about various concepts, terminologies and architecture of IoT systems.
2. To brief the students about sensors and actuators for design of IoT.
3. To gain knowledge on different protocols for design of IoT systems

UNIT –I

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, IoT frameworks, IoT and M2M.

15 Hours

UNIT –II

Sensors Networks: Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, Raspberry Pi Development Kit, RFID Principles and components.

15 Hours

UNIT-III

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, ZigBee, Z-Wave, IP Based Protocols for IoT IPv6, 6LowPAN, RPL, REST, CoAP, MQTT. Edge connectivity and protocols.

15 Hours

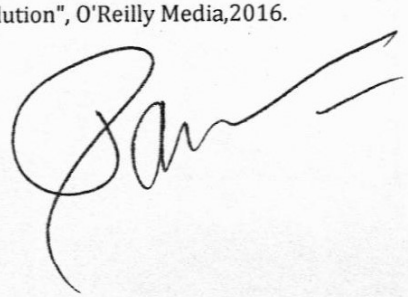
UNIT-IV

Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.

15 Hours

Suggested readings/ references:

1. Hakima Chaouchi, "The Internet of Things Connecting Objects to the Web", Wiley Publications
2. Olivier Hersent, David Boswarthick, and Omar Elloumi, "The Internet of Things: Key Applications and Protocols", Wiley Publications.
3. J. Biron and J. Follett, "Foundational Elements of an IoT Solution", O'Reilly Media,2016.



BCA (Web Technology) - SECOND SEMESTER

Course: Minor
Course Credits: (L-P-T)
(3-0-1)
Total marks: 100

Course Title: Internet of Things
Course Code: UMICST405
Mid Semester assessment: 10 Marks of 1.5 hours duration
End Semester assessment: 40 Marks of 2.5 hours duration
Practical: 25 Marks

For examinations to be held in May 2024, 2025 and 2026

NOTE FOR PAPER SETTERS FOR EXAMINATIONS -

The question paper will be divided into the following two sections. No question will be repeated in the question paper.

Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(4 x 3 = 12 marks)

Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.

(4 x 12 = 48 marks)

Note: -The paper setter shall ensure that the questions are uniformly distributed over entire syllabus.

Practical/ tutorial Evaluation
Daily evaluation of practical's/tutorials/Viva voce/Records etc.

10 marks

Final Examination

15 Marks

Pattern for external practical examination

Practical file	5 Marks
Written examination	5 Marks
Viva-Voce	5 Marks
Total	15 Marks

Pattern for external tutorial examination

Assignment file	10 Marks
Viva-Voce	5 Marks
Total	15 Marks