UNIVERSITY OF JAMMU

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

Academic Section
Email: academicsectionju14@gmail.com

NOTIFICATION
(22/Nov./Adp/68)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Studies in the subject of **Information Technology** of **Semester Ist and IInd for Four Year Under Graduate Programme (FYUGP)** under the **Choice Based Credit System** as per **NEP-2020 (as given in the annexure)** for the examinations to be held in the years as per the details given below:

Subject	**Semester**	**for the examination to be held in the years**
Information Technology (B.A/B.Sc.)	Semester-I	December 2022, 2023 and 2024
	Semester-II	May 2023, 2024 and 2025

The Syllabi of the courses are available on the University website: **www.jammuuniversity.ac.in**

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/22/9226-9265
Dated: 7-11-2022

Copy to:

1. Dean, Faculty of Mathematical Sciences
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

Sumita Sharma 7/11/22

Deputy Registrar (Academic)

7/11

B. A. / B. Sc. Honours
IN
INFORMATION TECHNOLOGY

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

UNIVERSITY OF JAMMU, JAMMU

Syllabus of B.A/B.Sc. Honours in Information Technology

(Four Year Undergraduate Programme)

For the students to be admitted in the year 2022-23, 2023-24 and 2024-25

The B.A/B.Sc. honours programme in Information Technology is a four year undergraduate programmebased on Semester System and consists of **eight** semesters. Each semester will be having minimum 90 working days. The student will opt Major and Minor courses from the same discipline. For minor course any subject other than major available in the college shall be chosen from within same discipline. However, Multidisciplinary foundation courses are to be chosen from the disciplines other than that of Major and Minor courses.

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	UMJITT101	Fundamentals of IT	4(3L+1P)	15	60	10	15	100
2	Minor	UMIITT102	Basics of Computation	4(3L+1T)	15	60	10	15	100
3	MD	UMDITT103	IT : Basics and Application	3	15	60	NA	NA	75
4	SEC	USEITT104	Office Tools	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	UMJITT201	Internet and Web Designing using HTML	4(3L+1P)	15	60	10	15	100
2	Minor	UMIITT202	Programming Concepts and Paradigms	4(3L+1P)	15	60	10	15	100
3	MD	UMDITT203	Technical Communication	3	15	60	NA	NA	75
4	SEC	USEITT204	Understanding e-Services	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.

B. A. / B. Sc. Honours
IN
INFORMATION TECHNOLOGY

Semester wise Course details

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

IT (Arts and Science) - FIRST SEMESTER

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

Course Title: Fundamentals of IT
Course Code: UMJITT101
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 Information Technology.
2. To gain knowledge of various Input output devices.
3. To learn the basics of Operating systems and networking concepts
4. To brief the students about DOS & Windows.

UNIT – I

Basics of Information Technology: Data, Information, Information Technology, Components of Computer System: CPU, ALU, Control Unit, Registers, Booting process, Characteristics of computers, History of Computers, Application of computers, Role of IT in Online Teaching –Learning. 15 Hours

UNIT - II

Hardware: Input and Output devices: keyboard, Scanner, mouse, joystick, Lightpen, trackball, Monitor, Printer, Plotter, Projector. Software: Types of Software: System Software, Application Software. Memory: Types of memory: RAM, types of RAM, ROM, Types of ROM, optical Disk, flash Drive, Memory Hierarchy. 15 Hours

UNIT - III

Operating system: Introduction, functions of Operating System, types of Operating system, Single user, Multi User, Multitasking, time Sharing operating System. Networking: Introduction, process of communication, types of communication media, Modes of communication: simplex, half duplex, full duplex. WWW and Internet: history and working of Internet, Generation of internet, introduction to world wide web, architecture of www, types of web documents. 15 Hours

UNIT – IV

Anatomy of Window: Title Bar, Menu Bar, Tool Bar, Scroll Bars, Document Area, and Status Bar.
Desktop Elements: Icons, My Computer, Recycle Bin, Taskbar, My Documents.
Control panel ,Disk Defragmentation, DOS, Evolution of DOS, Internal Commands : CLS, Ver, COPY, Volume, Date, Time, MD, CD, RD, Copy, Del, Ren, Move etc., External Commands : CHKDSK, FORMAT, Xcopy , Attrib, Defrag etc.

15 Hours

Suggested readings/ references:

1. Peter Norton's, "Introduction to Computer", TMH
2. Chetan Shrivastava "Fundamentals of Information Technology", Kalyani Publishers
3. Dr MadhulikaJain," Information Technology Concept", BPB
4. Alexis and Mathews Leon, "Fundamentals of Information Technology", Leon Press
5. P.K. Sinha, "Computer Fundamentals", BPB Publications
6. V. Rajaraman, "Fundamentals of Computers", PHI Learning

IT (Arts and Science) - FIRST SEMESTER

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

Course Title: Fundamentals of IT
Course Code: UMJITT101
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

IT (Arts and Science) - FIRST SEMESTER

Course:	Minor	Course Title: Basics of Computation	
Course Credits:	(L-P-T)	Course Code: UMIITT102	
	(3-0-1)	Mid Semester assessment: 15 Marks of 1.5 hours duration	
Total marks:	100	End Semester assessment: 60 Marks of 3.0 hours duration	
		Tutorial: 25 Marks	

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

Course objectives & learning outcomes:

1. To learn the fundamentals of Computer.
2. To gain knowledge of various Input output devices.
3. To learn the basics of Operating systems and networking concepts
4. To brief the students about number system

UNIT – I

Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply. 15 Hours

UNIT - II

Software: Types of Software: System Software, Application Software,Hardware: Input and Output devices: keyboard, Scanner, mouse, joystick, Lightpen, trackball, Monitor, Printer, Plotter, Projector.Memory: Types of memory: RAM, types of RAM, ROM, Types of ROM, Types of secondary memory devices, Memory Hierarchy 15 Hours

UNIT - III

Introduction to operating system and its functions, Types of Operating system: DOS, UNIX,LINUX, Single user, Multi User, Multitasking. Introduction to networks, process of communication, types of communication media, Modes of communication: simplex, half duplex, full duplex. Introduction to World Wide Web and its architecture, history of Internet and its working,generationof Internet. 15 Hours

UNIT – IV

Digital Systems and Binary Numbers: Binary numbers, Number –Base Conversions, Arithmetic operations using number system, Data Representation - fixed and floating, Complements(1's and 2's),Binary codes – weighted / non-weighted codes, BCD codes, Excess- 3-code, Grey codes, Conversion between codes, Code convertors Codes for error detection and correction (Hamming code). 15 Hours

Suggested readings/ references:

1. Peter Norton's, "Introduction to Computer", TMH
2. Chetan Shrivastava "Fundamentals of Information Technology", Kalyani publishers
3. Dr Madhulika Jain," Information Technology Concept", BPB
4. Alexisand Mathews Leon, "Fundamentals of Information Technology", Leon Press
5. P.K. Sinha "Computer Fundamentals", BPB Publications
6. V. Rajaraman "Fundamentals of Computers", PHI Learning

IT (Arts and Science) - FIRST SEMESTER

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

Course Title: Basics of Computation
Course Code: UMIITT102
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Tutorial: 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

IT (Arts and Science) - FIRST SEMESTER

Course:	Multidisciplinary Foundation Course	Course Title: IT Basics and Applications	
Course Credits:	(L-P-T)	Course Code: UMDITT103	
	(3-0-0)	Mid Semester assessment: 15 Marks of 1.5 hours duration	
Total marks:	75	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 learn the fundamentals of Information Technology.
2. To gain knowledge of various Input output devices.
3. To learn the basics of Operating systems.
4. To brief the students about e-commerce.

UNIT – I

Information Technology Basics: Data, information, Information technology, Components of Computer System: CPU, ALU, Control Unit, Registers, Booting process, Characteristics of computers, History of Computers, Application of computers, Role of IT in Online Teaching –Learning. Storage Fundamentals: Primary Vs Secondary Storage, Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: hard disks, Optical Disks, Compact Disks, Zip Drive, Flash Drives. 10 Hours

UNIT - II

Basic Computer Organization: Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers. 10 Hours

UNIT - III

Operating System: Functions, Measuring System Performance, Assemblers, Compilers and Interpreters. Batch Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux 10 Hours

UNIT – IV

Introduction to Electronic Payment System and its types, Strategies for developing electronic commerce web sites, Net marketplaces- characteristics of net marketplaces, types of net marketplaces, E-distributors, E procurement, Exchanges. Online content providers- digital copyrights & electronic publishing. 15 Hours

Suggested readings/ references:

1. Chetan Shrivastava "Fundamentals of Information Technology", Kalyani publishers
2. Dr Madhulika Jain," Information Technology Concept", BPB
3. Alexisand Mathews Leon, "Fundamentals of Information Technology", Leon Press
4. P.K. Sinha "Computer Fundamentals", BPB Publications
5. V. Rajaraman "Fundamentals of Computers", PHI Learning

IT (Arts and Science) - FIRST SEMESTER

Course:	Multidisciplinary Foundation Course	Course Title: IT Basics and Applications	
Course Credits:	(L-P-T)	Course Code: UMDITT103	
	(3-0-0)	Mid Semester assessment: 15 Marks of 1.5 hours duration	
Total marks:	75	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.

IT (Arts and Science) - FIRST SEMESTER

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

Course Title: Office Tools
Course Code: USEITT104
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 2022, 2023, and 2024

Course objectives & learning outcomes:

1. To provide working knowledge of word processing software.
2. To impart the skill to work with features of a spreadsheet software.
3. To develop the ability to prepare PowerPoint presentation.

UNIT -I

Word: Text Editor: Types- Line Editor, Word Editor, Page editor and their features. Entering text: selecting, editing, inserting,moving, copying, deleting, undo, redo, spell check. Formatting document: Changing Font type, applying effects, changing color, case, alignment, applying Superscript, Subscript, creating bulleted and Numbered List, Applying Border and Shading, Applying Drop Cap Effect, Header, Footer. Using Clip Art, Word Art. Working with Table: Creating, Entering Data, Modifying, Formatting, Inserting Picture. Copying Formatting to another Selection, Page Formatting, Setting Page Properties, Previewing and Printing a Document, Using Mail Merge. 10 Hours

UNIT -II

Excel: Introduction to Row, Cell, Workbook, Worksheet. Components and features of a Worksheet, Moving Around the Spreadsheet, Entering Data, Inserting and Deleting Cells, Columns and Rows, Changing Row Height and Column Width, Types of Data, Performing Calculations, Using Formula, Sorting Data, Custom Sorting, Charts, Filters. AutoFill and Flash Fill, Managing Worksheets, Saving Workbook. 10 Hours

UNIT-III

Powerpoint: Starting Powerpoint, Components, Creating and Saving Presentations, Opening, Closing, Running and Exiting a Presentation, Adding and deleting slides to a Presentation, Formatting Text in a slide, Inserting Objects in a Slide, Rotating and Resizing a Picture, Shape, Text or Object, Transitions, Animations and Views. 10 Hours

Suggested readings/ references:

1. Joe Habraken, "Microsoft Office Inside Out (Office 2021 and Microsoft 365)", Microsoft Press.
2. Joan Lambert, Curtis Frye, "Microsoft Office 2016 Step by Step", Microsoft Press.
3. Linda Foulkes , "Learn Microsoft Office 2019: A Comprehensive Guide to Getting Started with Word, PowerPoint, Excel,Acess, and Outlook", Packt Publishing Limited.

IT (Arts and Science) - FIRST SEMESTER

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

Course Title: Office Tools
Course Code: USEITT104
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 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.

IT (Arts and Science) - SECOND SEMESTER

Course:	Major	Course Title:	Internet and Web Designing using HTML
Course Credits:	(L-P-T)	Course Code:	UMJITT201
	(3-1-0)	Mid Semester assessment:	15 Marks of 1.5 hours duration
Total marks:	100	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 Internet and its different protocols.
2. To gain knowledge of world wide web and different networks.
3. To learn the basics of HTML and formatting tags.
4. To brief the students about HTML frames and other frameworks.

UNIT – I

Internet: History of Internet, working of Internet, how to use Internet, Prerequisites for using Internet, ISP, types of ISP, Types of Networks: LAN, MAN, WAN, Network devices: Router, Switch, bridge, hub, gateway, Repeater, Ethernet Internet Protocols: TCP/IP, FTP, HTTP,IP Address, MAC Address, Connecting to Internet, Advantages and disadvantages of using Internet, 15 Hours

UNIT - II

Applications of Internet: WWW, VoIP, Chat, email, etc., Introduction and architecture of WWW, Client, Browser, Server, Uniform Resource Locator (URL), Cookies. Internet versus WWW, DNS, Web Documents: Static Documents, Dynamic Documents, Active Documents. 15 Hours

UNIT – III

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, Dynamic HTML, Document Object Model, Features of DHTML 15 Hours

UNIT – IV

Style Sheet, Dynamic HTML, Document Object Model, Features of DHTML. Introduction, Designing with Style Sheets, Style Sheet Syntax, ID, Class Contextual Selectors, Cascading Order, Properties, Absolute and Relative Positioning, Layering Elements using Z-Index, Animating objects. HTML Frames: frameset, attributes of frame tag, Form Controls: Text Input Controls, Single-line text input controls, Attributes, Password Input controls, Multiple-Line Text Input Controls, Checkbox Control, Radio Button Control, Select Box Control, File Upload Box, Button Controls, Hidden controls, Difference between POST and GET method, action attribute, understanding URL. HTML media, Audio, Video, plug-ins, HTML, YouTube. 15 Hours

Suggested readings/ references:

1. Jon Duckett, "HTML and CSS: Design and Build Websites", Wiley
2. Jennifer Robins."Learning Web Design: A Beginner's Guide to HTML, CSS, Java Script and Web Graphics", Shroff
3. Darshan Magdum, "HTML: Learn Front-end web development", Kindle
4. Jon Duckett,"HTML and CSS: Design and Build Webs", Wiley

IT (Arts and Science) - SECOND SEMESTER

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

Course Title: Internet and Web Designing using HTML
Course Code: UMJITT201
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

IT (Arts and Science) - SECOND SEMESTER

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

Course Title: Programming Concepts and Paradigms
Course Code: UMIITT202
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 basic fundamentals of programming.
2. To gain knowledge of various programming paradigms and their types
3. To learn the basics techniques of problem solving
4. To brief the students about algorithmic design

UNIT – I

Introduction: Program, Programming Language, Evolution of programming languages: machine language, Assembly language, High Level language, Compiler, Interpreter, Assembler, Loader, Linker, Debugger, IDE, Source Code, object code, Basic Operations of a programming Environment, Selection of a programming language. 15 Hours

UNIT - II

Programming language paradigms: Paradigm, Imperative programming paradigm, procedural paradigm, Object Oriented Paradigm, Declarative Programming Paradigm, Logic Programming paradigm, Functional Programming Paradigm, Introduction to Concurrent Programming, Parallelism in Hardware, Advantages and limitations of Imperative and Declarative Paradigms. 15 Hours

UNIT - III

Basic Techniques of problem solving: Flowchart: symbols used in flowchart, terminator, process, document, decision, data, on-page reference, off-page reference, flow, drawing flowcharts for problem solving.

15 Hours

UNIT – IV

Problem Solving Techniques: -Algorithms: characteristics of Algorithms, steps in designing an algorithm, designing at least 10 algorithms for computational problems. Pseudocode: Advantages of writing pseudo code, Examples of pseudocode. 15 Hours

Suggested readings/ references:

1. Ravi Sethi, "Programming Languages, Concepts & Constructs", Pearson Education
2. Freidman, Wand, Haynes, "Essentials of Programming Language", PHI.
3. Robert .W. Sebesta, "Concepts of Programming Languages", Pearson Education
4. Watt, "Programming languages", Wiley.
5. Louden."Programming Languages", Cengage
6. Anthony A. Aaby, "Theory Introduction to Programming Languages"

IT (Arts and Science) - SECOND SEMESTER

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

Course Title: Programming Concepts and Paradigms
Course Code: UMIITT202
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

IT (Arts and Science) - SECOND SEMESTER

Course:	Multidisciplinary Foundation Course	Course Title: Technical Communication	
Course Credits:	(L-P-T)	Course Code: UMDITT203	
	(3-0-0)	Mid Semester assessment: 15 Marks of 1.5 hours duration	
Total marks:	75	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 learn the basic concept of technical communication.
2. To gain knowledge of forms of technical Communication
3. To learn the basics Technical Presentation
4. To brief the students about Technical communication skill

UNIT – I

Technical Communication: Features; Distinction between General and Technical Communication, Language as a tool of Communication, Dimensions of Communication: Reading & comprehension, Technical writing: sentences; Paragraph, Technical style: Definition, types & Methods, The flow of Communication: Downward; upward, Lateral or Horizontal; Barriers to Communication.. 10 Hours

UNIT - II

Forms of technical Communication, Technical Report: Definition & importance, Thesis/Project writing: structure & importance, synopsis writing: Methods; Technical research Paper writing: Methods & style, Seminar &Conference paper writing, Key-Note Speech: Introduction & Summarization, Expert Technical Lecture: Theme clarity, Analysis & Findings, 7 Cs of effective business writing: concreteness, completeness, clarity, conciseness, courtesy, correctness, consideration. Programming language paradigms: Paradigm, Imperative programming paradigm, procedural paradigm, Object Oriented Paradigm, Declarative Programming Paradigm, Logic Programming paradigm, Functional Programming Paradigm, Introduction to Concurrent Programming, Parallelism in Hardware, Advantages and limitations of Imperative and Declarative Paradigms. 10 Hours

UNIT - III

Technical Presentation: Forms, interpersonal Communication, Class room presentation, style, method, Individual conferencing: essentials: Public Speaking: method, Techniques: Clarity of substance, emotion, Humour, Modes of Presentation, Overcoming Stage Fear: Confident speaking, Audience Analysis & retention of audience interest, Methods of Presentation: Interpersonal, Impersonal, Audience Participation: Quizzes & Interjections. Basic Techniques of problem solving: Flowchart symbols used in flowchart, drawing flowcharts for problem solving. 10 Hours

UNIT – IV

Interview skills, Group Discussion: Objective & Method, Seminar/Conferences Presentation skills: Focus, Content; Style; Argumentation skills: Devices: Analysis, Cohesion & Emphasis, Critical thinking, Nuances: Exposition narration & Description, effective business communication competence: Grammatical, Discourse competence: combination of expression &conclusion, Socio-linguistic competence: Strategic competence: Solution of communication problems with verbal and non verbal means 15 Hours

Suggested readings/ references:

1. Meenakshi Raman & Sangeeta Sharma, "Technical Communication – Principles and Practices", Oxford Univ.
2. R.C. Sharma & K. Mohan, "Business Correspondence and Report Writing",Tata McGraw Hill
3. L.U.B. Pandey, "Practical Communication: Process and Practice", A.I.T.B.S.
4. Sherman, Theodore A, "Modern Technical Writing", Apprentice Hall

IT (Arts and Science) - SECOND SEMESTER

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

Course Title: Technical Communication
Course Code: UMDITT203
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 Ashall 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 Bshall consist Eight (8) long answer questions having two questions from each unit. The students are requiredto 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.

IT (Arts and Science) - SECOND SEMESTER

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

Course Title: Understanding e-Services
Course Code: USEITT204
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

Course objectives & learning outcomes:

1. To provide working knowledge of word processing software.
2. To impart the skill to work with features of a spreadsheet software.
3. To develop the ability to prepare PowerPoint presentation.

UNIT – I

Web Security

Malware and its types, Viruses ,Worms Spyware ,Trojan horse ,Logic Bombs ,Ransomware , Key loggers , Adware, Spyware

Cyber threats and its types : Denial of Service ,Man in the Middle ,Phishing ,SQL Injection , Password Attacks, cyber stalking etc.

Protection against Cyber threats, identity protection, proper usage of passwords, privacy, confidentiality of information, Anti Virus, firewall, reporting cybercrime.

10 Hours

UNIT - II

Electronic Mail , Instant Messaging and Collaboration

Basics of E-mail: What is an Electronic Mail, Mailbox: Inbox and Outbox, Creating and Sending a new E-mail, attachment , difference between Bcc & Cc , Forwarding an E-mail message, Replying an E mail Message, Sorting and Searching emails, Spam mail, Draft mail, trash,E-mail Filter .

Instant Messaging and Collaboration: Using Instant messaging, Instant messaging providers, Best Practices for Instant Messaging , Netiquettes;

Google forms: Creation , Sharing ,Setting ,Managing responses, Google sheets. 10 Hours

UNIT – III

E-Governance Services and Financial Literacy

Definition of e-Governance, Interactions in e-Governance: Government to Government, Government to Citizen, Government to Business, Government to Employee, Advantages of e-Governance, Various e-Governance Initiatives, Using various E-governance services like Dig locker, Aadhar, Parivahan, GEM etc

E-payment system, Types of e-payment system: UPI [Unified Payment Interface] ,AEPS [Aadhaar Enabled Payment System] ,USSD[Unstructured Supplementary Service Data] ,Card [Credit / Debit}, eWallet ,PoS [Point of Sale] , Internet Banking : National Electronic Fund Transfer (NEFT) ,Real Time Gross Settlement (RTGS) Immediate Payment Service (IMPS),Secured Online Payment methods. 10 Hours

Suggested Readings:

1. Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, "Network Security: The Complete Reference", McGraw Hill Education.
2. E Balagurusamy, "Fundamentals of Computers", Tata McGraw Hill.
3. Behrouz A. Forouzan, "Data Communication and Networking", McGraw Hill Education.
4. P. Kumar, A.Tomar, and R. Sharmila, "Emerging Technologies in Computing: Theory, Practice, and Advances", 1st Edition, 2021.
5. Peter Norton, "Introduction to Computers", Tata McGraw Hill.
6. K. C. Laudon, & C.G. Traver, "E-commerce", MA: Pearson, 2013.

IT (Arts and Science) - SECOND SEMESTER

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

Course Title: Understanding e-Services
Course Code: USEITT204
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.

UNIVERSITY OF JAMMU

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

Academic Section
Email: academicsectionju14@gmail.com

NOTIFICATION
(23/July/Adp./58)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Studies in the subject of **Information Technology** of Semester **IIIrd** and **IVth** for **Four Year Under Graduate Programme (FYUGP)** under the **Choice Based Credit System** as per **NEP-2020 (as given in the annexure)** for the examinations to be held in the years as per the details given below:

Subject	**Semester**	**For the examinations to be held in the year**
Information Technology	Semester- III	Dec. 2023, 2024 and 2025
	Semester-IV	May 2024, 2025 and 2026

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/6308-6318
Dated: 11-7-2023.
Copy for information and necessary action to:

1. Dean, Faculty of Mathematical Sciences
2. HOD/Convener, Board of Studies in **Computer Science & IT**
3. Sr. P.A.to the Controller of Examinations
4. All members of the Board of Studies
5. Confidential Assistant to the Controller of Examinations
6. I/C Director, Computer Centre, University of Jammu
7. Deputy Registrar/Asst. Registrar (Conf. /Exams. UG)
8. Incharge, University Website for Uploading of the notification.

Deputy Registrar (Academic)

10/7/23 10/7/23

B. A. / B. Sc. Honours
IN
INFORMATION TECHNOLOGY

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)	

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	UMJITT101	Fundamentals of IT	4(3L+1P)	15	60	10	15	100
2	Minor	UMIITT102	Basics of Computation	4(3L+1T)	15	60	10	15	100
3	MD	UMDITT103	IT : Basics and Application	3	15	60	NA	NA	75
4	SEC	USEITT104	Office Tools	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	UMJITT201	Internet and Web Designing using HTML	4(3L+1P)	15	60	10	15	100
2	Minor	UMIITT202	Programming Concepts and Paradigms	4(3L+1P)	15	60	10	15	100
3	MD	UMDITT203	Technical Communication	3	15	60	NA	NA	75
4	SEC	USEITT204	Understanding e-Services	2	10	40	NA	NA	50

Semester–III

S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
					Mid Semester	End Exam	Assessment	Exam	
1	Major	UMJITT301	Programming in C	4(3L+1P)	15	60	10	15	100
2	Major	UMJITT302	Data communication and Networking	4(3L+1P)	15	60	10	15	100
3	Minor	UMIITT303	Digital Electronics	4(3L+1T)	15	60	10	15	100
4	MD	UMDITT304	E-commerce	3	15	60	NA	NA	75
5	SEC	USEITT305	Cyber Security	2	10	40	NA	NA	50

Semester–IV

S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
					Mid Semester	End Exam	Assessment	Exam	
1	Major	UMJITT401	Database Management System & SQL	4(3L+1P)	15	60	10	15	100
2	Major	UMJITT402	Data Structure using C Language	4(3L+1T)	15	60	10	15	100
3	Major	UMJITT403	Software Engineering	4(3L+1T)	15	60	10	15	100
4	Major	UMJITT404	Fundamentals of Operating System	4(3L+1T)	15	60	10	15	100
5	Minor	UMIITT405	Operating System	4(3L+1T)	15	60	10	15	100

HEAD
Deptt. of Computer Sc. & IT
University of Jammu
Jammu-180006

IT (Arts and Science) - THIRD SEMESTER

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

Course Title: Programming in C
Course Code: UMJITT301
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 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

Problem solving, Algorithms, Flowcharts, History of C language, Structure of C program, Basic input/output statement, compiling and running a C program, Errors: syntax, linker, runtime and logical errors.
Character set of C language, identifiers, keywords, data types, variables, constants.

15 Hours

UNIT – II

Preprocessor directives, Operators: Unary, Binary: Mathematical, Relational and Logical operators, ternary operator, Operator precedence and associativity, selection statements- if statement, if-else statement, nested if, ladder if statement, switch statement. 15 Hours

UNIT – III

Iterative statements-while loop, do while, for loop, Nested loops, infinite loops, goto statement, break and continue statement.
Functions-prototype of a function: parameter list, return type, function call, passing arguments to a function: call by address, call by value, recursive function, user defined and library functions- mathematical and string functions.

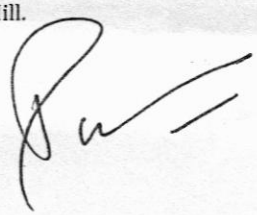
15 Hours

UNIT – IV

Storage classes in C. Arrays (Single and double dimensional): Definition, Declaration. Passing array to function.
Pointers: Understanding Pointers, Accessing the address of variable, declaring pointer Variables, Initialization, accessing a variable through pointer. 15 Hours

Suggested readings/ references:

1. E. Balaguruswami, Programming in C, PHI
2. Gottfried. B, Theory and problems of Programming with C Language, Tata Mc Graw Hill.
3. Kenneth. A, C Problem Solving and Programming, PHI.
4. Dan Gookin,C Programming, Wiley Dreamtech.
5. Y. P. Kanetkar, Understanding Pointers In C, BPB Publications.



IT (Arts and Science) - THIRD SEMESTER

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

Course Title: Programming in C
Course Code: UMJITT301
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

IT (Arts and Science) – THIRD SEMESTER

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

Course Title: Data Communication and Networking
Course Code: UMJITT302
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 study the basic taxonomy and terminology of the computer networking and enumerate the layers
2. of OSI model and TCP/IP model.
3. To study the fundamentals of Physical layer, and explain the types of transmission media with real
4. time applications.
5. To study data link layer concepts, design issues, and protocols.
6. To gain core knowledge of Network layer routing protocols and IP addressing.
7. To explore the basic knowledge of cryptography and network security

UNIT-I Fundamentals of Communication and Network Topologies

Basics of Communication: Analog and Digital, Data and Signal, Point to Point and Multi-Point Connections

Network Topologies, Transmission Modes, Inter-networking, LAN Technologies and Protocols, Modulation and its type, Overview of switching techniques

15 Hours

UNIT-II IP Addresses and Protocols

IP Addresses and Types (IPV4 and IPV6), Classes of IP Addresses, OSI Reference Model, TCP/IP Model, Routing Information Protocols: Unicast and Multicast, Socket Programming Concepts (TCP,UDP)

15 Hours

UNIT-III Network Protocols and Security

Client-Server Architecture, HTTPs, DNS, SMTP, FTP Protocols, Network Security: Threats, Attacks, and Firewalls
Cryptographic Algorithms: DES, AES, RSA, Key Exchange Methods, Digital Signatures

15 Hours

UNIT-IV Introduction to Scripting Languages

Server-side and Client-side Scripting Languages Concepts, Introduction to JavaScript, Data Types, Variables

Conditional and Loop Control Statements, Functions, String Manipulation, Mathematical Functions

15 Hours

Suggested readings/ references:

1. Andrew S. Tanenbaum, "Computer Networks", 5 e, 2013, Pearson Education Asia.
2. . Behrouz A. Forouzan, "Data Communications and Networking", 4e, 2004, Tata McGraw Hills.
3. William Stallings. "Data and Computer Communication", 7e, 2016, Pearson Education Asia.
4. Prakash C. Gupta, "Data Communications and Computer Networks", PHI
5. Michael A. Miller, "Data and Network Communications", 2e, Delmar Thomson Learning.
6. James F. Kurose and Keith W. Ross, "Compter Networking", 3e, Pearson Education.
7. William A. Shay, "Understanding Data Communications and Networks", 2e, Thomson Asia Pvt. Ltd.
8. Peter Norton and Dave Kearns, "Complete Guide to Networking", ie, Techmedia India Ltd.
9. Douglas E. Comer, "Internet networking with TCP/IP Vol I & II", 3e, PHI.

IT (Arts and Science) – THIRD SEMESTER

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

Course Title: Data Communication and Networking
Course Code: UMJITT302
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

IT (Arts and Science) – THIRD SEMESTER

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

Course Title: Digital Electronics
Course Code: UMIITT303
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical/Tutorial: 25 Marks

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

Course objectives & learning outcomes:

1. To familiarize students with the components of digital electronics, logical organization and the hardware and corresponding algorithms for computer arithmetics.
2. To study memory organization and the functions of each element of a memory hierarchy.
3. To understand processor performance at different levels of processing.
4. To familiarize students with the design of a Hardware descriptive language.
5. To help the students in understanding and analyzing different hardware designs, mathematical

UNIT-I

Data and Information: Features of Digital Systems, Number Systems: Decimal, Binary, Octal, Hexadecimal & their inter conversions, Representation of Data: Signed Magnitude, r's complement & r-1's complement, Binary Arithmetic, Fixed point representation and Floating-point representation of numbers.

Codes: BCD, Excess-3, Gray code, hamming code, alphanumeric codes (ASCII, EBCDIC, UNICODE), code conversions.

10 Hours

UNIT-II

Boolean Algebra: Basic gates (AND, OR, NOT gates), Universal gates (NAND and NOR gates), Implementing all gates using Universal gates, other gates (XOR, XNOR gates). Boolean identities, Boolean Theorems , Multi level NAND & NOR gates, De Morgan Laws. Karnaugh maps: SOP and POS forms,

10Hours

UNIT-III

Combinational Circuits: Half adder, full adder, code converters, combinational circuit design, Multiplexers and demultiplexers, encoders, decoders, Combinational design using mux and demux.

Sequential Circuit Design: Flip flops (RS, Clocked RS, D, JK, JK Master Slave, T, Counters, Shift registers and their types, Counters: Synchronous and Asynchronous counters.

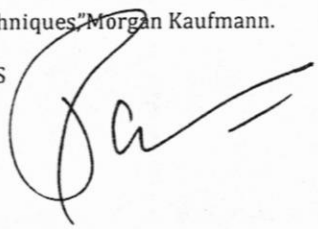
10Hours

UNIT-IV

Computers: Basic Organization, Memory: ROM, RAM, Static and Dynamic RAM, DRAM Refreshing, PROM, EPROM, EEPROM, Secondary Memory: Hard Disk & optical Disk, Cache Memory, I/O devices, Memory Hierarchy, Solid State Disk. 15 Hours

Suggested readings/ references:

1. JiaweiHan&MichelineKamber, "DataMining–ConceptsandTechniques–,3rdEdition", Elsevier.
2. MargaretHDunham, "DataMiningIntroductoryand Advancedtopics"PEA.
3. Ian H.Witten and EibeFrank, "DataMining:Practical Machine Learning Toolsand Techniques",Morgan Kaufmann.
4. Modern Digital Electronics by R. P. Jain, 3rd Edition, McGraw Hill
5. Digital Design and Computer Organisation by Dr. N. S. Gill and J. B. Dixit, University S
6. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
7. Digital Electronics By D.A. Godse, A.P. Godse , Techinical Publications
8. Digital Electronics And Micro – Computers by R. K. Gaur, Dhanpat Rai Publications
9. Floyd, T.L. and Jain, R. P., Digital Fundamentals, Pearson Education.



IT (Arts and Science) – THIRD SEMESTER

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

Course Title: Digital Electronics
Course Code: UMIITT303
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 3.0 hours duration
Practical/Tutorial: 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)

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(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

IT (Arts and Science) – THIRD SEMESTER

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

Course Title: E-Commerce
Course Code: UMDITT304
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration

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

Course objectives & learning outcomes:

1. Understand the basic concepts and technologies used in the field of management information systems;
2. Have the knowledge of the different types of management information systems;
3. Understand the processes of developing and implementing information systems;
4. Be aware of the ethical, social, and security issues of information system

UNIT -I

Overview of developments in Information Technology and Defining E-Commerce: Introduction to e-Commerce, Scope of electronic commerce, definition, e-Commerce and Trade Cycle, Benefits and limitations of E-Commerce, E- Markets, Internet E-Commerce in perspective. Value chain, Supply chain, Electronic Market, Electronic Data Interchange, Internet Commerce, Architectural framework of Electronic Commerce, Web based E Commerce Architecture.

10 Hours

UNIT -II

Consumer Oriented E Commerce E-Retailing: Traditional retailing and e retailing, Benefits of e retailing, Key success factors, Models of e retailing, Features of e retailing. E services: Categories of e-services, Web-enabled services, matchmaking services, Information-selling on the web, e entertainment, Auctions and other specialized services. Business to Business-Electronic Commerce

10 Hours

UNIT-III

Digital Marketing: Digital Marketing, Online Advertisement, Ad Targeting, Search Engine Marketing, Keyword Advertising, Search Engine Optimization, Display Ad Marketing, Interstitial Ad, Video Ad, Advertising Exchanges, Programmatic Advertising, Real-Time Bidding, E-mail Marketing, Affiliate Marketing, Social Marketing, Mobile Marketing, Local Marketing, Online Marketing Metrics, Pricing Models for Online Advertisements, Case Studies: Facebook Marketing Tools, Twitter Marketing Tools, Pinterest Marketing Tools, Location Based Marketing Tools: Google AdSense

10 Hours

UNIT-IV

Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. Digital economy: Identify the methods of payments on the net – Electronic Cash, cheques and credit cards on the Internet.

10 Hours

Suggested readings/ references:

1. Commerce, Strategy, Technologies and Applications By: David Whiteley Tata McGraw-Hill Edition.
2. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.
3. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.
4. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A ManagerialPerspective", Addison-Wesley.
5. Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3rd Edition, PHI, Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3RDEdition, Pearson Education.

IT (Arts and Science) - THIRD SEMESTER

Course:	Multi-disciplinary (MD)	Course Title: E-Commerce	
Course Credits:	(L-P-T)	Course Code: UMDITT304	
	(3-0-0)	Mid Semester assessment:	15 Marks of 1.5 hours duration
Total marks:	75	End Semester assessment:	60 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 will be repeated in the question paper.

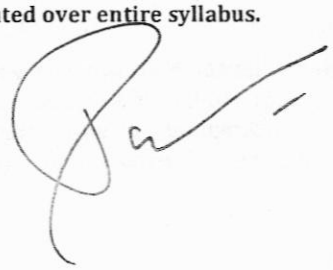
Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks.

(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.



CA (Arts and Science) - THIRD SEMESTER

Course:	Skill Enhancement Course (SEC)	Course Title: Cyber Security	
Course Credits:	(L-P-T)	Course Code: USEITT305	
	(2-0-0)	Mid Semester assessment:	10Marks of 1.5 hours duration
Total marks:	50	End Semester assessment:	40 Marks of 2.5 hours duration

Course objectives & learning outcomes:

1. To provide the basic knowledge of cyber crimes.
2. To impart the knowledge of security threats.
3. To learn the fundamentals of safeguarding against cyber crimes.

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

UNIT-I

Cyber Crime and its types, Cyber security, Components of Cyber Security, Need of data privacy and security, Computer Security Concepts (Confidentiality, Integrity and Authentication).
Security Threats/Attacks - DoS, DDoS, Spoofing, virus, worms, Trojans, Backdoor, phishing, and spam, Vulnerabilities – Network, Operating System, Process, Human Protection from cyber-attacks.

UNIT - II

Web attacks (Browser attacks, Web attacks targeting users, Obtaining user's or website data, email attacks), Digital payments and its security(Online banking security, Mobile banking security, Security of debit/credit card), Cyber Security of digital devices, Tools and technology for cyber security (Encryption, Anti-virus, Firewalls, Cyber security best practices, Platform to report cybercrime, Security controls (Management, Operational, Physical), Digital Forensics, Ethical hacking, Database Security, Social Engineering, Careers in cyber security.

UNIT – III

Introduction to cryptography, Encryption and Decryption, Characteristics of Good Encryption Technique, Plain text and Cipher text, Substitution techniques–Caesar Cipher, Monoalphabetic Cipher, Polygram Substitution and Play Fair. Types of Encryption Systems, Cryptanalysis, Symmetric and asymmetric cryptography, Authentication (Password-Based, Address-Based and Certificate-Based Authentication)

Suggested Readings:

1. Principles of Information Security – M. E. Whitman and H. J. Mattord, Cengage Learning.
2. Network Security Essentials: Applications and Standards - William Stallings, Pearson.
3. Cryptography and Network Security – Atul Kahate, McGraw Hill Professional Publication.
4. Information Security: The complete reference – Mark Rhodes-Ousley, McGraw Hill Professional Publication.
5. Information Security: Principles and Practices – Mark S. Merkow and Jim Breithaupt, Pearson.
6. Network Security: Private communication in a Private world – C. Kaufman, R. Perlman, M. Speciner, Pearson.

HEAD
Deptt. of Computer Sc. & IT
University of Jammu
Jammu-180006

IT (Arts and Science) – THIRD SEMESTER

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

Course Title: Cyber Security
Course Code: USEITT305
Mid Semester assessment: 10Marks 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.

HEAD
Deptt. of Computer Sc. & IT
University of Jammu
Jammu-180006

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Database Management System & SQL
Course Code: UMJITT401
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 present an introduction to database management systems, with an emphasis on how to organize,maintain and retrieve-efficiently, and effectively-information from a DBMS.
2. Design ER-models to represent simple database application scenarios and convert them into relational tables
3. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
4. To familiarize students with the basic issues of transaction processing and concurrency control.
5. Construct simple and moderately advanced database queries using Structured Query Language (SQL).

UNIT-I

Overview of DBMS: Data, Files, Records, Advantages and disadvantages of Traditional file Approach, Introduction to Database, DBMS: Introduction, Need of DBMS, components of DBMS, advantages and disadvantages. Three level Architectural of Database, Centralized and Client Server Architecture for DBMS, Advantages and Disadvantages of DBMS.

15 Hours

UNIT-II

Relational DBMS: definition, concept of table, Concept of keys (primary, unique, candidate, foreign etc). Data models and types of [traditional, semantic, hierarchical, network, relational] E-R diagram, Notations used in E-R Model, Relationships and Relationship types, Conversion of ER Diagram to Relational Model.. Database management System Structure, Data manager, Database Administrator and Data Dictionary, Relational data models, Relational Algebra.

15 Hours

UNIT-III

Normalization: Functional dependency, Anomalies and data redundancies in Database, Properties of Normalized relations, First, Second, Third Normal Form, Boyce-Codd Normal Form (BCNF), Fourth Normal Form, Fifth Normal Form.

Overview of SQL: Categories of SQL Commands: Data Definition Language, Data Manipulation Language, Query Processing, Data types in SQL, Operators, Expressions, Create Database, Drop Database

15 Hours

UNIT-IV

SQL: Table creation, insertion, deletion, Alter, Update and Delete Query. Select Statement, Inserting Values, Constraints, and Retrieval of data from Table, Table deletion,
SQL queries using conditions like WHERE Clause, AND, OR, NOT, LIKE Clause, TOP Clause, ORDER BY And GOURP BY, WILD Cards, JOINS, DISTINCT Keyword, DATE Functions and Other In-Built Functions, VIEWS.

15 ours

Suggested readings/ references:

1. Bipin C.Desai: An Introduction to Database Systems, West-publishing company.
2. Elmasri, Navathe, Somayajulu, Gupta: Fundamentals of Database Systems, Pearson Education.
3. Date, C.J.: An Introduction to Database Systems Addison Wesley Pearson Education.
4. Narayan S Umanath, Richard W Scamell : Data Modelling and Database Design, Thomson Course Technology India Edition.
5. R.A. Parida, Vinod Sharma: The power of Oracle 9i, Firewall Media Publications.
6. Bayross Ivan: SQL, PL/SQL the programming language of Oracle, BPB publications.

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Database Management System & SQL
Course Code: UMJITT401
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

IT (Arts and Science)–FOURTH SEMESTER

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

Course Title: Data Structure using C Language
Course Code: UMJITT402
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 the fundamentals of Operating Systems.
2. To learn the mechanisms of OS to handle processes and threads and their communication.
3. To learn the mechanisms involved in memory management in contemporary OS.
4. Shell programming

UNIT-I

Algorithms and Basics: Analysis on Algorithm, Complexity of Algorithm, Introduction and Classifications of Data Structures. Data Structure operations. Time and space complexity of algorithms. Rate of Growth: Big O Notation. Structures, Self- Referential Structures

15 Hours

UNIT-II

Linear Data Structures: Arrays and its representations, Representation and Operations of Singly Linked Lists, Stacks and Queues and their implementation using Arrays and Linked lists. Applications of Arrays, Linked list, Stacks and Queues.

15 Hours

UNIT-III

Non-Linear Data Structures: Trees, Binary Trees, Binary tree representation and traversals, Binary Search Trees, Complete 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, Selection Sort, Merge Sort, Quick Sort, Heap Sort,Time and space complexity of sorting & search algorithms

15 Hours

Suggested readings/ references:

1. S. Lipschutz, "Data Structures", Tata McGraw Hill Education, 1st Edition, 2008.
2. D. Samanta, "Classic Data Structures", PHI Learning, 2nd Edition, 2004.
3. Data Structure through C by Yashwant Kanetkar, BPB Publications.
4. Data Structure through C in Depth by S.N. Srivastva BPB Publications.
5. Introduction to Data Structre in C by Ashok N Kamthane, Pearson Publications.

IT (Arts and Science)-FOURTH SEMESTER

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

Course Title: Data Structure using C Language
Course Code: UMJITT402
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

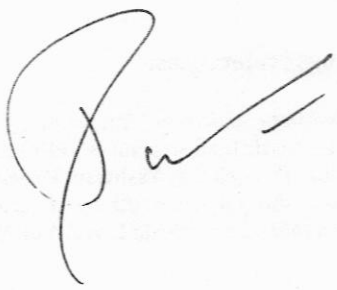
15 Marks

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



IT (Arts and Science)–FOURTH SEMESTER

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

Course Title: Software Engineering
Course Code: UMJITT403
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 gain the knowledge of how analysis, design and coding processes are conducted in a software project.
2. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
3. Demonstrate an ability to use the basic techniques and tools necessary for software development.

UNIT - I

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. 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.

15 Hours

UNIT - II

Feasibility analysis: deciding project goals, examining alternative solutions, cost–benefit analysis
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 .

15 Hours

UNIT - III

Structured Software systems analysis and design: procedure specifications in structured English, examples and cases, decision tables for complex logical specifications, specification oriented design vs procedure oriented.
Data oriented Software systems design: entity relationship model, E-R diagrams, relationships, cardinality and participation, data base design.

15 Hours

UNIT - IV

Data input methods: coding techniques, requirements of coding schemes, error detection of codes, validating input data, input data controls, interactive data input
Designing outputs: output devices, designing output reports, screen design, graphical user interfaces, interactive I/O on terminals.

15 Hours

Suggested readings/ references:

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.

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Software Engineering
Course Code: UMJITT403
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 -

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(4 x 12 = 48 marks)

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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

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Fundamentals of Operating System
Course Code: UMJITT404
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25

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

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

Operating system overview: Definition, Evolution of Operating System, Functions of Operating System, Types of Operating systems.
Operating System Structure: Layered, Monolithic, Microkernel, Operating System services, System Calls. Introduction to Linux/Unix, Android, Concept of Virtual Machine.

10 Hours

UNIT -II

Process Management: Process Concept, Process states, Process Control Block, Types of Schedulers, Cooperating Processes, Inter-process Communication, Threads.
CPU Scheduling: Scheduling criteria, Scheduling Algorithms.
Process Synchronization: Race Condition, The Critical-Section problem, Semaphores.
Deadlock: Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.

10 Hours

UNIT-III

Main Memory: Multiprogramming with fixed partitions, Multiprogramming with variable partitions, Swapping, Paging, Segmentation, Segmentation with paging.
Virtual Memory: Demand Paging, Page replacement algorithms, Allocation of frames, Thrashing, Locality of reference.
Disk Scheduling: Disk Structure, Disk Scheduling Algorithms.
File System: File concept, File organization and access mechanism.

10 Hours

UNIT-IV

Linux Introduction & File System- Basic Features, Advantages, Basic Architecture of UNIX/LINUX System, Kernel, Shell.
Commands for files & Directories- cd, cp, mv, rm, mkdir, more, less, Creating and Viewing Files using cat, File View and Comparisons etc. Understanding Shell, Processes in LINUX – Process Fundamentals, Connecting Processes with Pipes, Redirecting Input Output, Batch Commands- Kill, ps, who, sleep. Printing Commands- grep, fgrep, find, sort, cal, banner. File related Commands-ws, sat, cut, grep, dd etc.10 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.

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Fundamentals of Operating System
Course Code: UMJITT404
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25

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

NOTE FOR PAPER SETTERS FOR EXAMINATIONS -

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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

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Operating System
Course Code: UMIITT405
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25

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

Course objectives & learning outcomes:

1. To have a basic understanding of the features of an Operating System.
2. To understand the services provided by the OS to users, processes and other systems.
3. To learn to work on an open-source Operating System through command mode.

UNIT –I

Operating system Definition, Generation of Operating System, Types of Operating System, Services of Operating System, OS structure: Layered, Monolithic, Microkernel. Concept of System Calls, System Programs and System Boot, Concept of Virtual Machine.

10 Hours

UNIT -II

Process Management: Definition, Process states, Process state transitions, Process control block.
Process scheduling: Definition, Scheduling objectives, Types of Schedulers, Scheduling Criteria: CPU utilization, Throughput, Turnaround time, Waiting time, Response time, Scheduling algorithms: Preemptive and Non-preemptive, FCFS, SJF, RR.
10 Hours

UNIT-III

Deadlock: Definition, Characteristics, Concept of Deadlock Prevention, Avoidance, Detection and Recovery.
Memory Management: Contiguous Memory Allocation-Fixed and variable partition, Fragmentation, Paging. Demand Paging, Replacement policies: First In First Out (FIFO), Not Recently Used (NRU) and Least Recently Used (LRU), Optimal (OPT)

10 Hours

UNIT-IV

File concept: File Structure, File types, File Access Mechanism, Allocation Methods (contiguous, linked, indexed)
Linux/Unix Environment, The Login Prompt, General Features of Linux/Unix commands, command structure. Understanding of some basic commands such as cd, cp, mv, rm, mkdir, more, less, cat, grep, find, cut, wc, echo, ls, kill, ps, sort, who, date, passwd, cal, sleep etc.Combining commands, redirections, pipes, filters, Linux/Unix administrator. Root login, Super user login: su command.
10 Hours

Suggested readings/ references:

1. Abraham Silberschartz,Peter Baer Galvin and Greg Gagne, "Operating system Principles", WSE Wiley,2006.
2. Andrew. S. Tanenbaum and Herbert Bos, "Modern Operating Systems",Pearson Prentice Hall,2015.
3. Harvey M. Deitel, "An Introduction to Operating System",Addison-Wesley publications, 1984.
4. William Stallings,"Operating Systems Internals and Design Principles",Pearson Education. 5th Edition,2005.

IT (Arts and Science) - FOURTH SEMESTER

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

Course Title: Operating System
Course Code: UMIITT405
Mid Semester assessment: 15 Marks of 1.5 hours duration
End Semester assessment: 60 Marks of 2.5 hours duration
Practical: 25

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

VALUE ADDED COURSE

Course Title: Machine Learning Using Python
Course type: Certificate
Course Credits :(L-P-T) (3-0-0)

Course objectives & learning outcomes:

1. To understand the basics of Machine Learning.
2. To learn various libraries, environment and applications of python for machine learning.
3. To have the basic understanding of various supervised and unsupervised learning techniques

UNIT – I: Introduction to Machine Learning and Python

Overview of machine learning and its applications. Understanding the types of machine learning (supervised, unsupervised, and reinforcement learning). Introduction to Python and its packages for machine learning (NumPy, Pandas, Matplotlib, Scikit-learn). Setting up the environment for machine learning in Python. Data pre-processing techniques for machine learning (data cleaning, feature scaling, feature selection)

10 Hours

UNIT – II: Supervised Learning

Regression analysis (linear regression, logistic regression). Classification techniques (k-nearest neighbors, decision trees, support vector machines). Model evaluation techniques (confusion matrix, precision, recall, F1 score, ROC curve, AUC)

10 Hours

UNIT – III: Unsupervised Learning

Clustering techniques (k-means, hierarchical clustering, density-based clustering). Dimensionality reduction techniques (PCA, t-SNE). Association rule mining (Apriori algorithm). Recommender systems (collaborative filtering)

10 Hours

Suggested readings/ references:

1. Introduction to machine learning with Python: A guide for data scientist by Muller.
2. Python programming- Anurag Gupta
3. Introduction to machine learning- E. Alpaydin
4. Programming and problem solving with Python- AN Kamth